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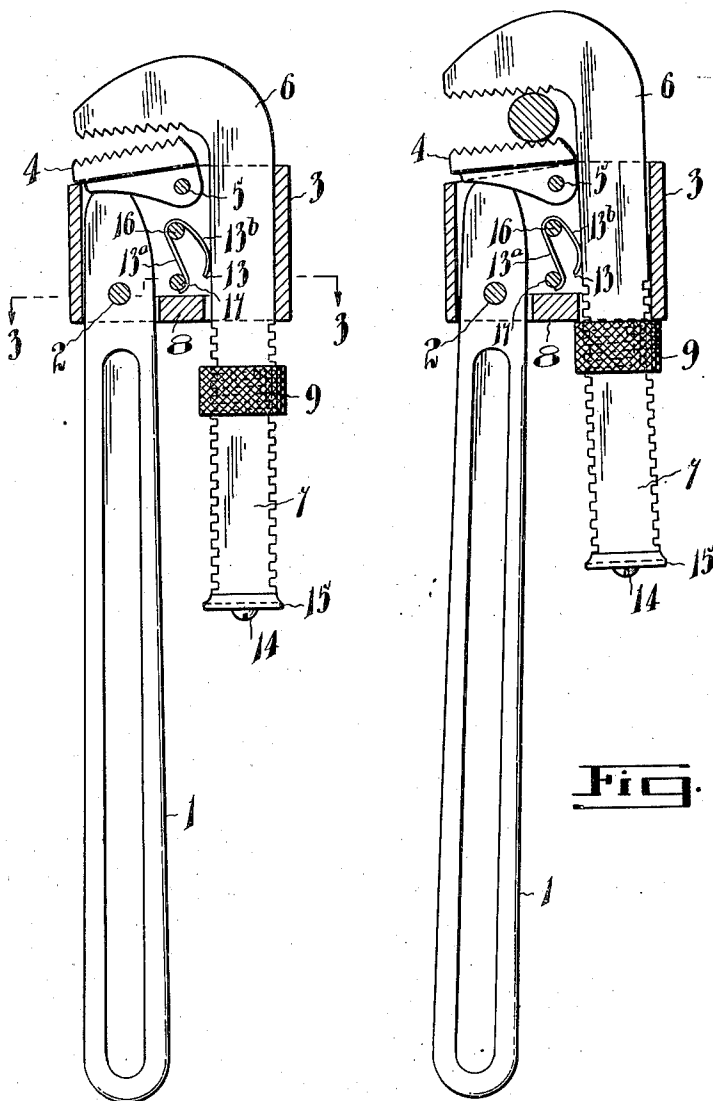


Fig. 1.

Fig. 2.

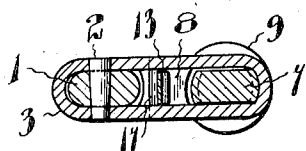


Fig. 3.

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WRENCH

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This invention relates to wrenches of the adjustable jaw type and particularly to pipe wrenches in which the outer jaw is the movable jaw and carried by a stem slidable in a carrier casing supporting the relatively stationary jaw and carried by the shank or handle, and my object is to devise a construction which is simple, reliable and durable and which can be quickly set to engage nuts, pipes or the like of any diameter within the range of the tool.

I attain my objects by means of constructions which may be briefly described as follows. The stem of the movable jaw slides freely in the carrier casing and is provided with a nut threaded on the stem whereby it may be adjusted to limit the extension of the stem.

The stationary jaw is rockable in the carrier casing by the shank which has a camming engagement with the underside of the jaw.

The stem of the movable jaw is pressed against the rear end of the carrier casing by means of a removable leaf spring engaging the stem and transverse abutment pins in the casing.

The invention is hereinafter more fully described and is illustrated in the accompanying drawing in which

Fig. 1 is a side elevation of the wrench, partly broken away;

Fig. 2 a similar view showing the wrench engaged with a pipe; and

Fig. 3 a section on the line 3—3 in Fig. 1.

In the drawing like numerals of reference indicate corresponding parts in the different figures.

The wrench comprises three main portions, the handle or shank 1, the carrier casing 3, the inner jaw 4 and the outer or movable jaw 6, which is provided with a stem 7 slidable in the carrier casing. The stem 7 slides between the end of the carrier casing and the transverse wall or abutment 8 extending between opposite sides of the casing and located adjacent the lower edge thereof. The inner end of the jaw 4 is engageable by the stem 7 to prevent any but the smallest rocking movement of the stem (see Fig. 2). The stem 7 of the movable jaw is threaded and on it is screwed the nut 9, which, when the wrench is in operation, abuts the lower edge of the casing 3. A stop 15 is secured to the lower end of the stem 7 by means of a screw 14, this stop being intended to prevent the complete disengagement of the nut 9 from the stem 7. The inner jaw 4 is pivoted in the carrier casing by means of the pivot pin 5. Adjacent the lower edge of the casing the shank or handle 1 is pivoted by means of the pivot pin 2, which is

preferably removable for a purpose which will hereinafter appear. The upper end of the shank has a camming engagement with the underside of the jaw 4 so that by rocking the handle or shank to the left, as indicated in the drawing, the inner jaw 4 will be rocked in the direction of the outer jaw 6. The adjacent end of the carrier casing limits the rocking movement of the shank.

A spring 13, hereinafter more fully described, bears against the side of the stem 7 to frictionally retain the stem in any position to which it is moved.

The mode of operation is substantially as follows: If it is desired to set the wrench to a pipe or other object to be embraced, the jaws are positioned about the object and the stem 7 slid in the casing until both jaws are engaged with the object. The nut 9 may then be quickly screwed up to engage the under side of the casing. Now as the wrench is turned by pressure on the shank 1, the latter moves on its pivot to exert an outward pressure on the pivoted inner jaw 4 by reason of a camming engagement between the two. Obviously rocking the shank on its pivot will force the jaw 4 outwardly into a firm gripping relation with the embraced object. This hinged mounting of the inner jaw prevents the wrench from slipping, does away entirely with lost motion and avoids any rolling movement which might otherwise jamb the teeth of the jaws on the pipe or other object gripped.

It will be noted that the nut bearing against the underside of the casing provides a pivotal mounting for the movable jaw, which pivotal movement is possible owing to the fact that the wall 8 extends only partly up from the underside of the carrier casing. The pivotal movement is, of course, quite small as only enough play is allowed to provide for an easy sliding movement of the stem.

The spring 13 is an important feature of my invention, its principal function being to frictionally hold the movable jaw in any position to which it may be set until such time as the nut 9 is screwed up against the carrier casing. By positioning it between the inner jaw and the wall 8 where it bears against the exposed inner side of the stem 7, the stem is pressed evenly and firmly against the end wall of the casing.

It is very desirable to avoid deformation or breakage of the spring that bending of the spring during use should be reduced to a minimum and by positioning it as shown this is attained since the rocking movement of the stem 7 is very

small due to the fact that it is the inner jaw that rocks to give the wrench its grip and not the movable outer jaw.

It is also important for assembly purposes and for occasional replacement that the spring and other parts should be specially designed for this purpose. The pivot 2 is therefore formed with a driving fit in the casing so that it may be readily removed when desired. Secured in the carrier casing are the abutment pins 16 and 17. The spring 13 is V-shaped, the bend being preferably curved and fitted about the pin 16. The arm 13^a of the spring bears against the pin 17 and its end is preferably curved to fit partly around the pin to resist accidental upward displacement of the spring. The arm 13^b of the spring is preferably somewhat curved to bear, adjacent its free end, against the stem 7.

When the pin 2 is removed the shank 1 is easily removed. The stop 15 is then removed and the stem 7 removed from the casing. The spring 13 is then readily introduced into the casing through the space left by the removal of the shank and may be readily fitted over the pin 16 and the end of its arm 13^a engaged with the pin 17. The stem 7 is then replaced and engages the arm 13^b of the spring as hereinbefore described.

From the above description it will be seen that I have devised a wrench which is strong, durable, easily repaired, quickly adjustable, not liable to slip and which grips practically without lost motion.

What I claim as my invention is:

1. In a wrench, the combination of a carrier casing; an inner jaw pivoted in the casing; a shank pivotally mounted in the casing and hav-

ing a camming engagement with the inner jaw; a movable jaw provided with a stem slidable in a guideway in the casing and having its inner side exposed the outer side of the guideway being substantially one plane surface from end to end; a nut threaded on the stem outside the casing; a leaf spring mounted in the casing between the shank and the stem and bearing against the exposed side of the stem; and abutments in the casing against which the spring bears to exert pressure against the stem to press it frictionally against the plane outer side of its guideway.

2. A wrench according to claim 1 in which the stem of the movable jaw slides between an end of the carrier casing and a transverse wall in the casing, the spring being located between the inner jaw and the said wall.

3. In a wrench, the combination of a carrier casing; an inner jaw pivoted in the casing; a shank pivotally mounted in the casing and having a camming engagement with the inner jaw; a movable jaw provided with a stem slidable in a guideway in the casing and having its inner side exposed, the outer side of the guideway being substantially one plane surface from end to end and its inner side formed by an abutment formed in the lower part of the casing and by the inner end of the inner jaw; a nut threaded on the stem outside the casing; a leaf spring mounted in the casing between the shank and the stem and bearing against the exposed side of the stem; and abutments in the casing against which the spring bears to exert pressure against the stem to press it frictionally against the plane outer side of its guideway.

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