T. J. JOHNSON.
WRENCH.
APPLICATION FILED FEB. 13, 1918.

1,279,349.

Patented Sept. 17, 1918.

FIG. 1.

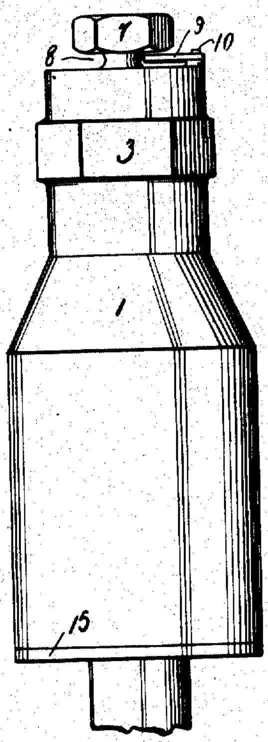


FIG. 2.

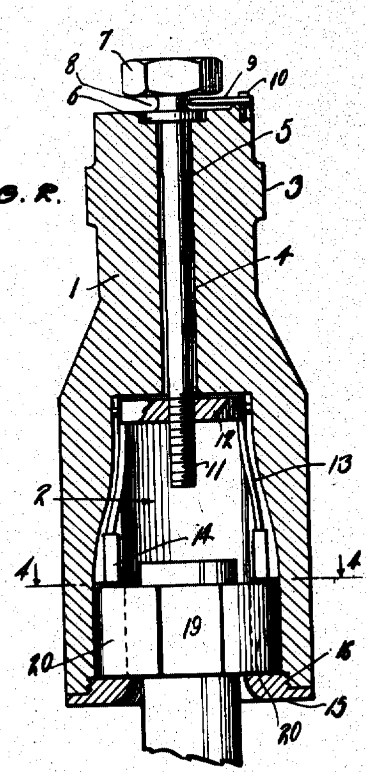


FIG. 3.

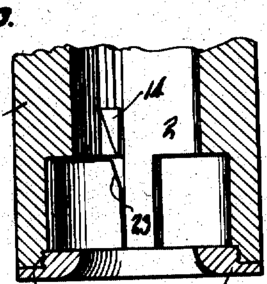
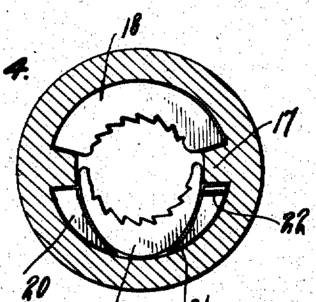


FIG. 4.



INVENTOR

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WRENCH.

1,279,349. Specification of Letters Patent. Patented Sept. 17, 1918.

Application filed February 13, 1918. Serial No. 216,874.

To all whom it may concern:

Be it known that I, TODD J. JOHNSON, a citizen of the United States, residing at Redlands, in the county of San Bernardino and State of California, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to tools, and more especially to those devices known as end wrenches of the type containing a socket reducer; and the object of the same is to produce an end wrench whose socket is reduced by improved means so as to apply it to the nut, pipe, or rod to be turned. The invention might be said to consist more particularly in the means for reducing the size of the socket, and for a fuller description thereof reference is made to the accompanying specification and drawings, wherein:—

Figure 1 is a side elevation of this wrench complete, and

Fig. 2 is a central vertical section of the same,

Fig. 3 is a sectional detail of the lower end of the wrench with certain parts reversed or inverted,

Fig. 4 is a horizontal section on the line 4—4 of Fig. 2.

The body 1 of this wrench has a large recess in what might be called its lower end, as indicated at 2, and its upper end may be externally reduced as shown. This portion is, however, made angular upon its exterior as shown at 3 for the application of an ordinary wrench thereto as will be explained below. Within this upper portion is a longitudinal opening or bore 4 through which passes the stem 5 of a screw, the same projecting out the upper end of the body and preferably having a collar 6 and an angular head 7 with a groove 8 between them, into which groove projects a finger or tongue 9 mounted on a screw 10 as shown. This serves for swiveling the screw within the bore 4 so that it may be rotated but will not advance or recede, and yet when the screw is to be removed for any reason the tongue 9 is turned aside so that its tip passes out of the groove 8 and the screw is free as will be understood. Any other equivalent swivel might, however, be employed. The head 7 is obviously made angular for the reception of a wrench, but it might be flattened or given the contour of a thumb-piece so that it could be turned by hand if preferred. The same may be said of the angular portion 3, but it is usual for the purpose of giving wrenches considerable strength to make these parts in such shape that a supplemental wrench may be applied thereto. The lower or threaded end 11 of the screw-stem 5 engages a nut 12 which stands at the top of the recess 2 and from which hang two spring arms 13, each carrying a wedge 14 at its lower end as seen in Fig. 3. I call these spring arms because they could be to a certain extent resilient, but this might be accomplished by mounting them rather loosely on the nut 12. The wedges are of metal, appropriately shaped for the purpose they are to serve, as will appear below. The lower end or mouth of the recess is provided with a ring-shaped closure or annulus 15, preferably screwed into place as seen at 16, above which said recess contains two upright integral webs as shown at 17 in Fig. 4. These sub-divide the interior into two chambers, in one of which rests what I will call the fixed jaw 18 and in the other of which rests the outer part of the movable jaw 19, whereas its inner part overlies the webs as seen in Fig. 2. The fixed jaw is curved through an arc corresponding with the interior curvature of the body, and fits neatly but yet removably against the two webs. When the annulus 15 is removed, this jaw may be removed and reversed if it is desired to change the direction in which its teeth shall face. The movable jaw 19, however, is built on a curve much sharper than that of the inner wall of the body, which it touches only at one point as seen in Fig. 4, and its ends or legs therefore come out of contact with said inner wall; it is purposely made so long that the tips of said legs stand inside the webs as shown. Outside the ends or legs of the movable jaw and between them and the inner surface of the head there are therefore formed two spaces which collectively would be crescent-shaped. In each of these I mount loosely an appropriate casing or more properly a block 20 whose smaller end 21 is directed toward and behind the center of the jaw 19 and whose larger end or base 22 stands adjacent the web 17. It is into the space between each base and web that the tip of the wedge 14 is forced, when the nut 12 and arm 13 move downward, and such movement is obviously effected by turning the screw in the proper direction.

From this description it will be seen that with the parts standing normally as seen in

Fig. 4, when an article is inserted into the socket made up by the elements standing within the recess 2, it becomes necessary to reduce the size of that socket so as to grip the article referred to. This reduction is brought about by forcing downward the wedges by turning the screw, and the tips of the wedges pass into the spaces behind the bases 22 of the blocks 20; the latter in turn are moved around toward each other and behind the movable jaw 19, and the jaw is of course forced inward toward the fixed jaw which reduces the size of the space between them. By removing the annulus 15, both jaws may be dropped out of place and reversed end for end, so that in that case their teeth will face in the opposite direction. It is quite possible to bevel off the corners of the bases 22 of the blocks 20, as shown at 23 in Fig. 3, so that the wedges may enter more easily behind them, and in fact it is possible to bevel off the corners at both the upper and lower ends, if desired to reverse the blocks or replace them in the event that they should become worn. I find it convenient to remove the annulus 15 for purposes of reversing but its principal function is for the initial insertion of parts and their removal from time to time for purposes of cleaning. I do not wish to be limited to the size or material of parts, and details other than as given below are not essential.

What is claimed as new is:—

1. In an end wrench, the combination with a body having an axial bore enlarged at one end into a recess, a screw whose shank is rotatably mounted in said bore, and a nut at the inner end of the screw; of an annulus mounted around the mouth of said recess, fixed and movable jaws supported on said annulus, and means for advancing the movable jaw toward the fixed jaw by the advance of said nut.

2. In an end wrench, the combination with a body having a recess in one end and a bore continuing axially therefrom through the other end of the body, a screw whose shank is swivelly mounted through said bore and has a head on its exterior, a nut within said recess threaded onto the screw, a pair of arms carried by the nut, and wedges at the tips of the arms; of fixed and movable jaws mounted within said recess near its mouth, blocks movably mounted behind the movable jaw, and means for advancing said blocks by the advance of said wedges.

3. In an end wrench, the combination with a body having a recess in one end and a bore continuing axially therefrom through the other end of the body, a screw whose shank is swivelly mounted through said bore and has a head on its exterior, a nut within said recess threaded onto the screw, a pair of arms carried by the nut, and wedges at the tips of the arms; of a fixed jaw removably mounted in said recess, a movable jaw also removably mounted in said recess, wedge-shaped blocks behind said movable jaw, and means for advancing said blocks by the advance of said wedges.

4. In an end wrench, the combination with a body having an axial bore enlarged at one end into a recess, a screw whose shank is rotatably mounted in said bore, a nut at the inner end of the screw, and a pair of wedges carried by said nut; of an annulus removably mounted around the mouth of said recess, fixed and movable jaws supported on said annulus, and means for advancing the movable jaw toward the fixed jaw by the advance of said wedges.

5. In an end wrench, the combination with a body having an axial bore enlarged at one end into a recess, a screw whose shank is rotatably mounted in said bore, a nut at the inner end of the screw, and a pair of wedges carried by said nut; of an annulus removably mounted around the mouth of said recess, fixed and movable jaws supported on said annulus, there being upright webs within said recess outside the ends of the movable jaw and against which the ends of the fixed jaw abut when in place, and means for moving the movable jaw toward the fixed jaw by the advance of said wedges.

6. In a wrench, the combination with a body having a recess in one end, wedges within the body, and means for moving them longitudinally thereof; of fixed and movable jaws in said recess, and wedge-shaped blocks behind the movable jaw moved circumferentially in the recess by the longitudinal movement of the first-named wedges.

7. In a wrench, the combination with a body having in one end a recess provided with opposite longitudinal webs projecting into it, means for partially closing the mouth of said recess, a fixed jaw with its ends abutting said webs, and a movable jaw with its ends passing inside said webs, both jaws retained in said recess by said means; of wedge-shaped operating means behind the movable jaw, and actuating devices for said means.

8. In a wrench, the combination with a body having in one end a recess provided with opposite longitudinal webs projecting into it, means for partially closing the mouth of said recess, a fixed jaw with its ends abutting said webs, and a movable jaw with its ends passing inside said webs, both jaws retained in said recess by said means; of wedge-shaped blocks resting on said closing means each with its base toward one web and its smaller end toward the other block, wedges between said web and the adjacent bases, and actuating devices for moving said wedges longitudinally, for the purpose set forth.

9. In a wrench having one jaw fixed and the other movable toward and away from it, the combination with a wedge movable in one plane behind the movable jaw; of a second wedge movable behind the first wedge and in a direction at right angles to its plane of movement, and means for moving the second wedge.

10. In a wrench, the combination with a body having a substantiallv cylindrical recess in one end, a fixed jaw at one side of the recess, and a movable jaw at the other side of the same; of a wedge movable circumferentially within the recess between the inner wall of the same and the outer side of the movable jaw, and a wedge movable axially in the recess to cause the movement of the first wedge.

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

TODD J. JOHNSON.

Witnesses:

ASHEL CUNNINGHAM,

S. M. CURTIS.