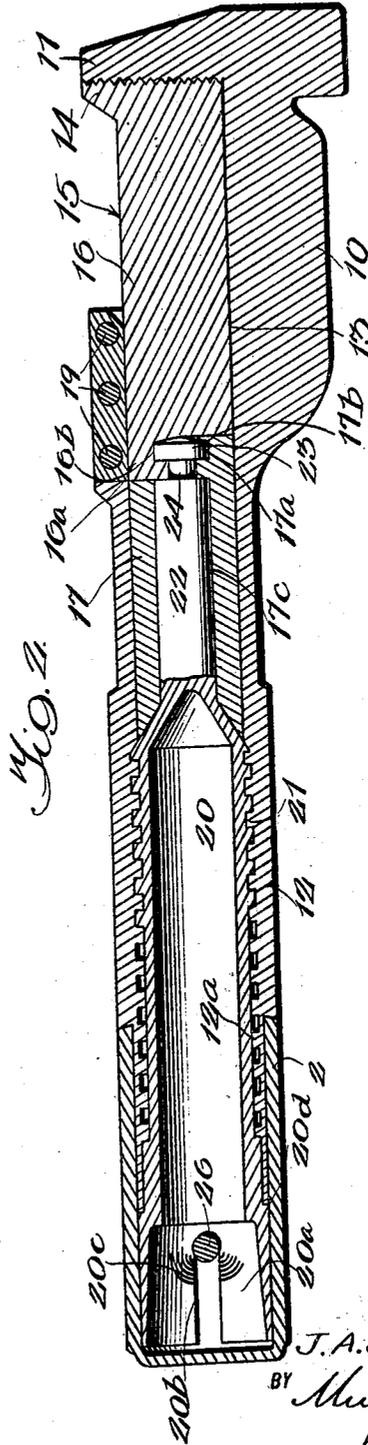
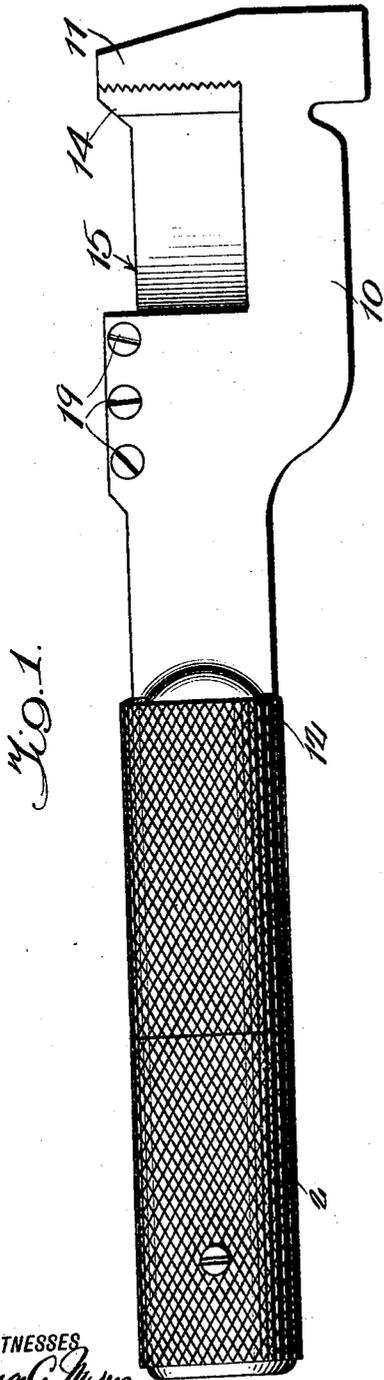


1,413,121.



WITNESSES
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1,413,121.

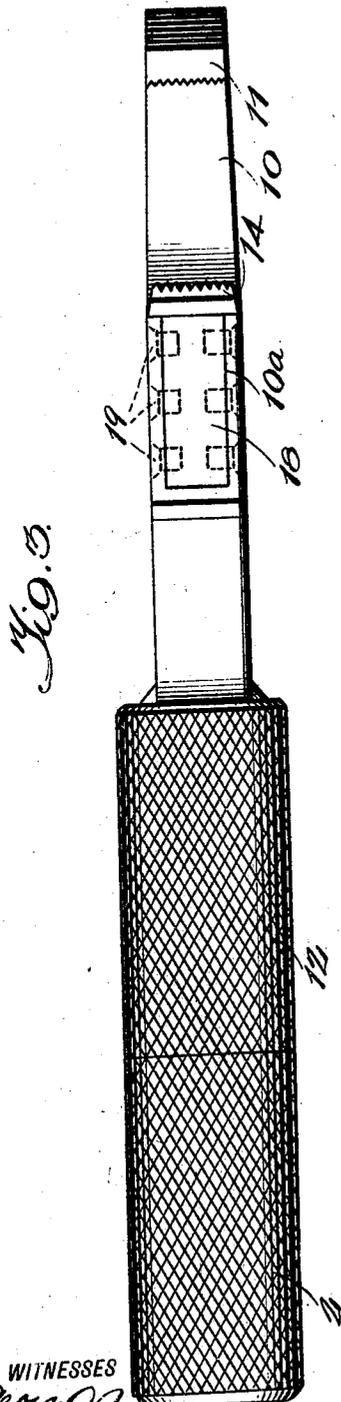


Fig. 3.

Fig. 6.

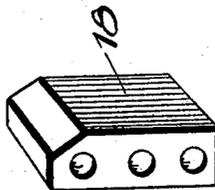


Fig. 5.

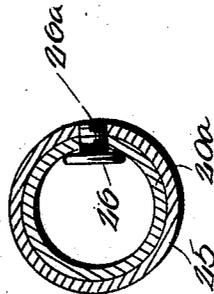
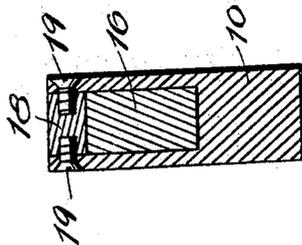


Fig. 4.



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1,413,121.

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To all whom it may concern:

Be it known that I, JOHN ARTHUR JOHNSON, a citizen of the United States, and a resident of Leavenworth, in the county of Leavenworth and State of Kansas, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

My invention relates to improvements in wrenches and has for its object to provide an improved wrench which is of simple and durable construction, reliable in operation and easy and inexpensive to manufacture, which may be easily and readily adjusted and which is adapted to exert a powerful gripping action upon the work.

Another object is to provide an improved wrench of this character which in assembly presents a substantially unitary structure and which may be easily dissembled for purposes of replacement or repair.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings, forming a part of this specification, in which

Figure 1 is a side elevational view of the wrench embodying the invention,

Figure 2 is a view in transverse vertical section,

Figure 3 is a front elevational view,

Figure 4 is a transverse sectional view on the line 4-4 of Figure 1,

Figure 5 is a sectional view on the line 5-5 of Figure 1, and

Figure 6 is a detail perspective view of the removable plate.

Referring to the drawings wherein, for the sake of illustration, is shown the preferred embodiment of the invention, the numeral 10 designates the body portion of the wrench. An outer jaw 11 is carried by the body portion at one end thereof and a tubular shank 12 is carried by the other end thereof. The body portion is provided with an opening 13 which is alined with the opening of the tubular shank and which is pref-

erably polygonal for a purpose which will hereinafter more fully appear.

An inner jaw 14 is operatively associated with the outer jaw. The inner and outer jaws constitute the coacting jaws of the wrench. The inner jaw 14 is provided with a shank designated generally at 15 and slidably arranged in the opening 13 of the body portion. The shank comprises sections 16 and 17 both of which are of general polygonal cross section whereby the shank is constrained to rectilinear movement through the opening of the body portion. As shown in Figure 2, the section 17 is provided with an axial opening or bore 17^c which extends entirely therethrough. The section 16 is provided with a reduced extension 16^a and the section 17 is provided with a complementary reduced extension 17^a. These reduced extensions are provided with complementary recesses 16^b and 17^b respectively.

A removable plate 18 normally closes an elongated opening 10^a provided in the front face of the body portion, the plate being secured in position by means of screws 19 or the like. When the plate 18 is removed and the jaws of the wrench are closed as shown in Figure 2, the inner jaw 16 may be removed together with the section 16^a of the shank thereof, the opening 13^a being of sufficient extent to permit this operation.

Operating means for the coacting jaws is provided and includes a travelling screw 20 preferably hollow and having its threads operatively engaged with internal threads 21 provided on the inner wall of the tubular shank 12. These internal threads 21 thus constitute a threaded bearing for the travelling screw. A spindle 22 is carried by the travelling screw and is arranged in the opening 17^c of the shank section 17. A head 23 is rotatably arranged in the recess defined by the complementary recesses 16^b and 17^b and is connected to the spindle 22 by means of a neck 24 suitably secured to the head and to the spindle. The spindle, neck and head, together with the complementary recesses of the reduced extensions thus constitute common means for transmitting the linear motion of the screw to the inner jaw

for coupling the sections of the shank to each other. In this manner the travelling screw has a swivelled connection to the shank of the inner jaw.

5 A thimble 25 is rotatably arranged on an enlarged extension 12^a provided on the tubular shank 12 and its outer periphery is milled as shown in the drawings to facilitate gripping. The adjacent periphery of the
10 tubular shank is also milled. Means is provided for connecting the thimble to the travelling screw and includes a headed screw 26 engaged in a threaded opening provided in an extension 20^a of the travelling screw
15 and in an alined threaded opening provided in the thimble. The head of the screw 26 arranged within the wrench and the outer end of its shank is provided with a diametrical slot 26^a whereby it may be operated
20 upon by a screw driver or similar tool. The extension 20^a is provided with a longitudinal slot 20^b which extends from the outer end thereof to the threaded opening and it is also provided with a pair of bosses 20^c
25 struck from the material of the extension. The extension 20^a also presents an annular shoulder 20^d which engages the outer end of the tubular shank 12 to limit the inward movement of the travelling screw.

30 In assembling the wrench the section 17 of the shank of the inner jaw is mounted on the spindle 22 and the travelling screw is then inserted in the tubular shank, engaged with its threaded bearing and turned until
35 the inner section of the shank and the head and neck are alined with the opening 10^a of the body portion. The plate 18 is, of course, not in position at this time and the outer section 16 of the shank 15 and its inner jaw
40 14 are then slid into position. By this operation the sections of the shank 15 are coupled together as the head 23 is now confined in the recess defined by the complementary recesses of the sections. The only manner
45 in which this coupling may be broken down is by a lateral displacement of the section 16 and this is precluded by securing the plate 18 in position by means of its screws 19. The thimble is next positioned on the
50 wrench. This is accomplished by first threading the screw 26 into its opening from the interior of the extension 20^a, then sliding the thimble onto the extension 20^a and turning the screw 26 home by means of a
55 tool operating upon its slot 26^a.

In operation, the wrench is readily and easily adjusted to fit various sizes of work. The thimble 26 provides a means susceptible of receiving the full grip of the hand of the
60 operator and the turning thereof is thus greatly facilitated and the jaws may thus be brought to bear against the work with the proper degree of force. Moreover, all of the parts are readily accessible for pur-
65 poses of lubrication and repair. The thim-

ble may be easily removed or the sections of the shank of the inner jaw may be easily disassociated for purposes either of lubrication or of repair.

I claim:—

70 1. In a wrench, a body portion, an outer jaw carried at one end of said body portion, a tubular shank carried at the other end thereof, said body portion having a poly-
75 gonal opening extending therethrough, an inner jaw coacting with said outer jaw, a shank carried by the inner jaw and slidably extending through the opening of the body portion, said shank consisting of sections
80 having reduced extensions provided with complementary recesses, and operating means for said jaws comprising a threaded bearing formed on said tubular shank, a travelling screw coacting with said thread-
85 ed bearing, common means for transmitting the motion of the screw to the inner jaw and releasably coupling the sections thereof including a spindle secured to the travelling
90 screw, a head rotatably engaged in the complementary recesses and a neck connecting said head and said spindle, a thimble rotatably carried by the tubular shank and connecting means between said thimble and said
95 travelling screw.

2. In a wrench of the character described, 95 coacting jaws, shanks carried by said jaws and telescoping within each other, one of said shanks comprising sections having complementary recesses and operating means for
100 said jaws including a threaded bearing carried by one of said shanks, a travelling screw coacting with said bearing, common means for transmitting motion of said screw to said jaws and coupling the sections includ-
105 ing a spindle secured to the screw, a head rotatably engaged in the recess and a neck connecting the head and the spindle, a rotatable thimble and connecting means between the thimble and the travelling screw.

3. In a wrench of the character described, 110 coacting jaws, shanks carried by said jaws and telescoping within each other, one of said shanks comprising sections having complementary recesses and operating means for
115 said jaws including a threaded bearing carried by one of said shanks, a travelling screw coacting with said bearing, common means for transmitting the motion of said screw to said jaws and coupling the sections includ-
120 ing a spindle secured to the screw, a head rotatably engaged in the recess and a neck connecting the head and the spindle.

4. In a wrench of the character described, 125 coacting jaws, a tubular shank connected with one of said jaws, a second shank connected with the other of said jaws and oper-
130 ating in said tubular shank and operating means for said jaws comprising a threaded bearing formed on said tubular shank, a travelling screw coacting with said threaded

bearing and having swivelled connection with said second shank, and a thimble rotatably carried by the tubular shank and connected with said travelling screw.

5 5. In a wrench of the character described, coacting jaws, telescoping shanks carried by said jaws, one of said shanks comprising sections and operating means for said jaws

including a threaded bearing carried by one of said shanks, a rotatable travelling screw 10 coacting with said bearing and common means for transmitting only the rectilinear motion of said screw to said jaws and coupling the sections of the shank.

JOHN ARTHUR JOHNSON.