R. E. JOHNSON.

WRENCH.

APPLICATION FILED JULY 2, 1917.

1,281,020.

Patented Oct. 8, 1918.

Fig. 1.

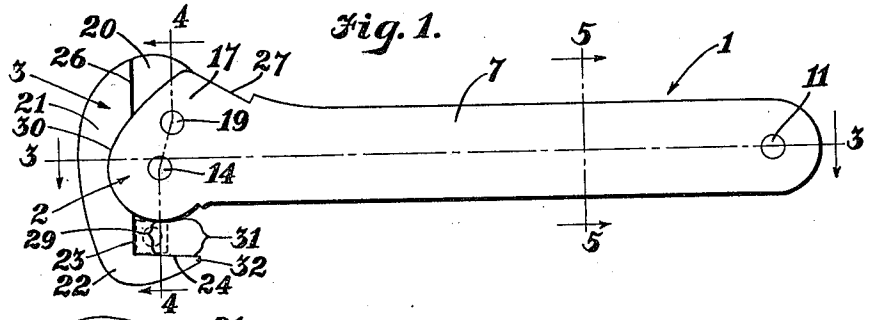


Fig. 2.

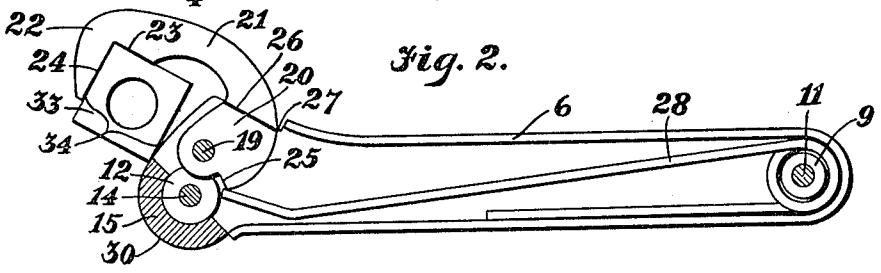


Fig. 3.

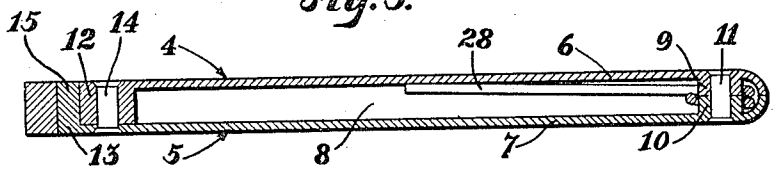


Fig. 4.

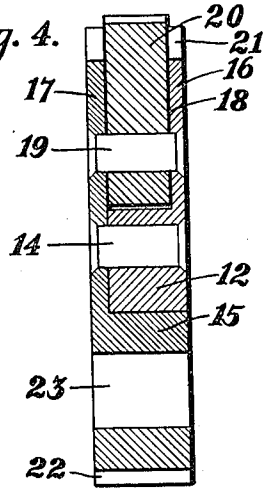
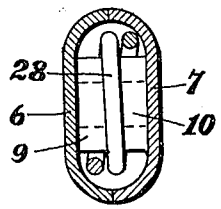


Fig. 5.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

RANSOM E. JOHNSON, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO JO HARDIE AND THOMAS McCALL, BOTH OF LOS ANGELES, CALIFORNIA.

WRENCH.

1,281,020. Specification of Letters Patent. Patented Oct. 8, 1918.

Application filed July 2, 1917. Serial No. 178,249.

To all whom it may concern:

Be it known that I, RANSOM E. JOHNSON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Wrenches, of which the following is a specification.

My invention relates to quick-adjusting wrenches, my object being to improve the lay-out and details of construction; and my invention consists of the novel features herein shown, described and claimed.

In the drawings:

Figure 1 is a plan view of my improved quick-adjusting wrench in normal position for use, as when held in the right hand to grip a small nut.

Fig. 2 is a view from the same point of vision as Fig. 1 with the front half-handle removed to show the details of construction and their arrangement when gripping a large nut.

Fig. 3 is a view in longitudinal section on the line 3—3 of Fig. 1 disclosing details of the handle and jaw mounting.

Fig. 4 is a cross-sectional detail on the line 4—4 of Fig. 1.

Fig. 5 is a cross-sectional detail on the line 5—5 of Fig. 1.

Referring more particularly to the drawings, 1 indicates a handle formed integral with a rigid wrench jaw 2. A pivoted wrench jaw 3 works in opposition to the rigid wrench jaw 2.

The details of the lay-out and construction of the handle 1 and the rigid wrench jaw 2 are as follows:

Mating pieces 4 and 5 are provided and may be malleable or steel castings but are preferably drop forgings. The mating pieces form half-handles 6 and 7 are curved in cross-section with their edges meeting and fitting together to produce the longitudinally extending hollow 8. Bosses 9 and 10 are formed integral with the mating pieces and are disposed at the extreme ends of the half-handles and extend into the hollow 8 where they meet. A handle rivet 11 is inserted through the bosses 9 and 10.

A circular and flat jaw-supporting head 12 is formed upon the half-handle 6, while the rigid jaw-head 13 is formed upon the half-handle 7. The inner faces of the heads 12 and 13 fit together, a rivet 14 being inserted to hold the parts together. A rigid jaw-rim 15 is formed integral with the edge of the jaw-head 13 and projects therefrom at right angles to fit tightly around the jaw-supporting head 12, said jaw-rim being concentric to the rivet 14 and extending around the head 12 substantially half its circumference. At the back edge of the handle and near the heads 12 and 13 are integral bearing plates 16 and 17 spaced apart to form the bearing opening 18 through which a bearing pin 19 is inserted.

Particular attention is directed to the configuration of the bearing plates 16 and 17, which form the working surfaces 30 of the jaw 2. These surfaces are arcuate and are described from the axis of the rivet 14, this axis being slightly off-center from the longitudinal center of the handle, as particularly shown in Fig. 1. The working surfaces are substantially semi-circular and terminate at opposite sides of the rivet 13 and substantially along a line inclined at 45° to the longitudinal center of the handle. The working surfaces of the bearing plates are continued across the end of the mating members and are slightly curved along a line substantially tangent to the arcuate portions 30 of the faces. These portions terminate with square stop-shoulders 26, by which the movement of the pivoted jaw member is limited. The entire working faces of the plates thus form a gradually tapering bearing face which terminates with a rapidly tapering face adapted to co-act with the gripping faces of the pivoted jaw member, as will be hereinafter described.

The details of the pivoted wrench jaw 3 are as follows:

The jaw 3 may be a steel casting but is preferably a drop forging, and comprises the shank 20 fitting in the bearing opening 18 between plates 16 and 17 and held pivotally by the pin 19. A spacing-arm 21 extends from the shank 20 and, in closed position, fits against the periphery of the head 13 and the rim 15; and the two-third nut-seat frame 22 at the free end of the spacing arm and carrying the nut-seat faces 23 and 24.

A spring-seat shoulder 25 is formed upon the inner end of the shank 20. Stop-shoulders 26 are formed at the juncture of the shank 20 with the spacing arm 21 to engage the rear edges 27 of the bearing plates 16 and 17 and limit the opening or backward

swing of the jaw 3. The spacing-arm 21 and the two-third nut-seat frame 22 are the same thickness as the rigid jaw 2 so that the upper and lower faces are flush as shown in Figs. 3 and 5.

The wire spring 28 is coiled to fit within the hollow 8 and extend twice around the bosses 9 and 10. The short end of the spring engages the wall of the handle 1 while the long end engages the spring-seat shoulder 25, the tension of the spring being exerted to swing the jaw 3 to the normal position shown in Fig. 1, with the complete nut-seat 29 to receive a small nut.

The bearing pin 19 around which the pivoted jaw 12 swings is positioned at an accurately determined point upon the opposite side of the longitudinal axis of the handle from the center of the rivet 14 and rearwardly from the head of the tool. The distance from the longitudinal axis of the handle to the center of the bearing pin substantially equalizes the width of the entrance 31, to the seat 29, when the fixed and movable jaws are in the position shown in Fig. 1. This peculiar eccentric mounting of the pivoted jaw causes its gripping end to describe an arc eccentric to the working surfaces 30 of the fixed jaw and also tangent and parallel to the gradually tapered faces of the working surfaces. Furthermore, due to the design shown, the nut seat faces 23 and 24 will always accommodate the corner of a square nut, while the working surfaces of the rigid jaw will bear against the side of the nut opposite the face 24. This will insure that the nut will be rigidly held without mutilation.

The entrance 31 to the nut-seat 29 is enlarged the point 32 being longer than needed for small nuts, so that said point 32 may serve as a hook to engage the corner of a large nut 33. Pressure upon the handle 1 toward the nut 33 will cause the jaw 3 to swing backwardly until the nut 33 will enter the seat 34 between the face 24 and the face 30.

In operation, the wrench is grasped in one hand and the point 32 drawn around one corner of the nut to be gripped. The handle is then drawn in opposition to the movable jaw and will cause it to swing upon its center and gradually recede from the working surfaces of the fixed jaw, thus forming an enlarged throat into which the nut will pass. When the two jaws have separated sufficiently to accommodate the nut, adjacent faces of the nut will be seated against the seat faces 23 and 24, while the face of the nut opposite the nut seat face 24 will bear against the working surface 30. When the nut has been thus seated the handle is swung in a direction to force the movable and fixed jaws together. This action will cause the nut to be forcefully gripped upon three sides, attention being directed to the fact that the gripping faces of the movable jaw and the fixed jaw are so disposed in relation to each other as to cause the working surfaces of the fixed jaw to wedge in along the face of the nut against which they bear and thus automatically increase the gripping power of the wrench during operation.

It will thus be seen that the wrench here disclosed, while formed of few parts of simple construction which may be readily assembled, also provides easily operated means for automatically gripping a nut and thereafter forcefully holding it within its gripped position during its rotation.

I claim:

1. In a wrench, a handle comprising mating pieces curved in cross-section with their edges meeting and fitting together to form a longitudinally extending hollow; bosses at the outer ends of the pieces and extending into the hollow and meeting; a circular flat jaw supporting head formed upon one mating piece, a rigid jaw head formed upon the other mating piece and fitting against the jaw supporting head, a rigid jaw rim formed integral with the edge of the jaw head and fitting tightly around the jaw supporting head, a spring in the hollow and coiled to fit around the bosses, one end of the spring engaging the wall and the other end of the spring extending freely through the hollow to the other end of the handle; a rivet inserted through the bosses and a rivet inserted through the jaw supporting head and through the rigid jaw head to hold the mating pieces together; bearing plates extending from the mating pieces and from the jaw supporting head and from the rigid jaw head and spaced apart, a bearing pin through the bearing plates, a wrench jaw pivotally mounted upon the bearing pin, and a spring seat shoulder extending from the pivoted jaw and engaging the free end of the spring.

2. In a wrench, a handle formed of two pieces; a circular flat jaw supporting head formed upon one of the pieces, a rigid jaw head formed upon the other piece and fitting against the supporting head; a rigid jaw rim formed integral with the edge of the jaw head and fitting tightly part way around the jaw supporting head; and a rivet inserted through the jaw supporting head and through the rigid jaw head to hold the pieces together.

In testimony whereof I have signed my name to this specification.

RANSOM E. JOHNSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."