

L. S. STARRETT & J. A. ADELL.

RATCHET WRENCH.

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Patented Mar. 25, 1913.

1,056,848.

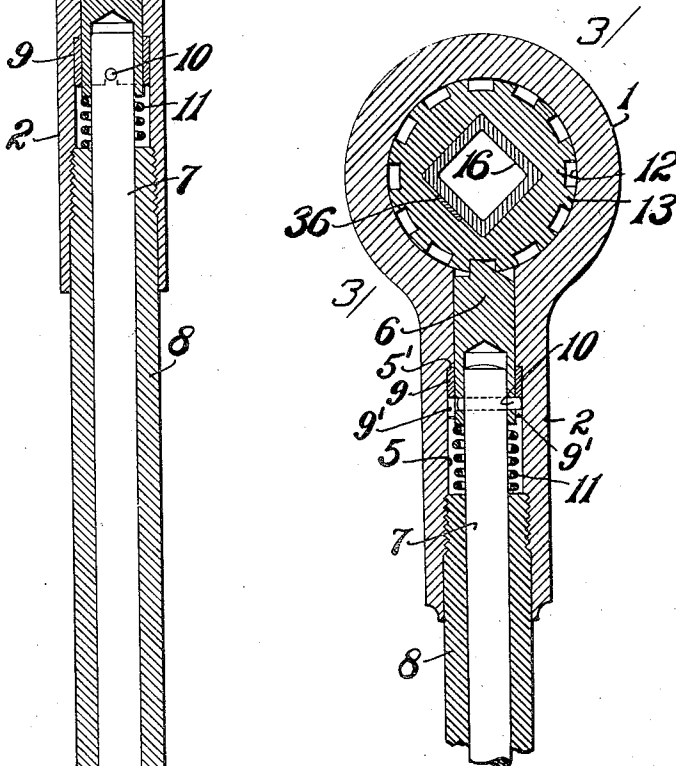
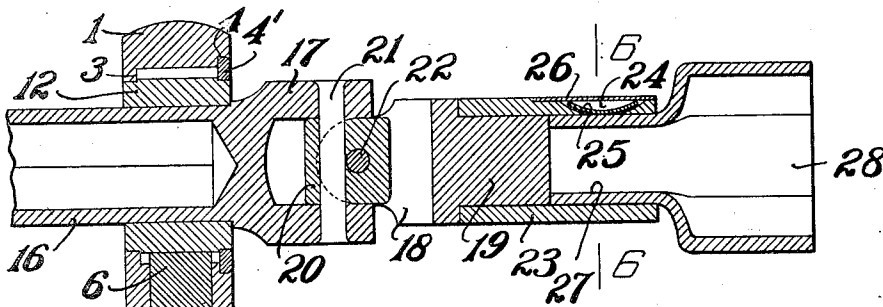


FIG. 2

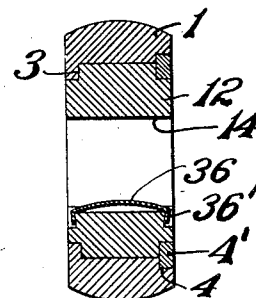


FIG. 3

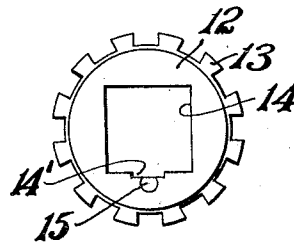


FIG. 4

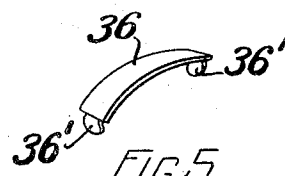


FIG. 5

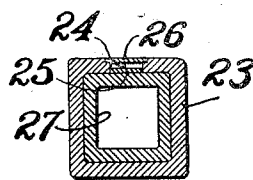


FIG. 6

FIG. 1

WITNESSES

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UNITED STATES PATENT OFFICE.

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RATCHET-WRENCH.

1,056,848.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, LAROE S. STARRETT and JOHN A. ADELL, citizens of the United States, residing at Athol, county of Worcester, Commonwealth of Massachusetts, have invented certain new and useful Improvements in Ratchet-Wrenches, of which the following is a specification.

This invention relates to wrenches, and particularly to a ratchet wrench.

Among the many users of wrenches there are a great number who require a light ratchet wrench adaptable to various positions and conditions of work, and easily shifted for different sized and shaped nuts. This is especially true among automobile users where a large number of different parts have to be reached in various positions, and where the shifting of tools or any complicated adjustment thereof adds additional annoyance to occasions and conditions which are not satisfactory even at the best. To the end, therefore, of providing a ratchet wrench capable of compact storage and easy assemblage, adjustment and readjustment, and yet capable of a great degree of adaptability in use, we have devised our present invention. In this we have provided for a certain construction and arrangement of faucet handle and shank and various improvements in socket and shank fastenings, all of which permit a ready and easy assemblage and a complete and satisfactory operation.

As illustrative of our invention we have shown in the drawings and will describe in the specifications a wrench embodying the principal features in a form which we have found well adapted to practical use. The structure and operation of these parts are fully set forth in the specification, and throughout specification and drawings like reference numerals are employed to illustrate corresponding parts.

In the drawings: Figure 1 is a longitudinal sectional view of our ratchet wrench, Fig. 2 is a longitudinal sectional view taken at right angles to that of Fig. 1, Fig. 3 is a transverse sectional view of the ratchet wrench, Fig. 4 is a detailed plan of the ratchet piece, Fig. 5 is a view of our stem holding spring, and Fig. 6 is a sectional view of the socket on the line 6-6, Fig. 1.

1 is a circular head having a radial neck. The head 1 is formed with a transverse

bore about one end of which a shoulder 3 is formed, and at the opposite end a channel or seat 4 is cut. Within the neck 2 is a radial bore 5, within which is located a reversible pawl 6 attached to a stem 7.

8 is a tubular handle screwed into the end of the radial neck 2. The stem 7 runs through this handle, and has its milled end 7' projecting slightly beyond the end of the handle.

Adjacent to the head 1 the radial opening of the neck 2 is enlarged to form a shoulder 5'. Against this shoulder a ring 9 is set having two oppositely disposed notches 9'.

The stem 7 is pinned to the pawl 6 by a pin 10 which projects slightly beyond the pawl, and is adapted to be engaged in either of the notches 9' of the ring 9 to hold the ratchet in either of its two operative positions.

11 is a coiled spring disposed about the stem 7 and abutting at one end against the end of the tubular handle 8 and at the other against the rear side of the pawl 6. The pawl 6 is therefore normally pressed in toward the transverse bearing, but is yieldable rearwardly.

12 is a ratchet piece having external ratchet teeth 13 and a central internal squared socket 14 passing through it from side to side. The pieces 12 is rotatably supported in the transverse bearing of the head 1 between the shoulder 3 and the beveled ring or washer 4' which is swaged on the seat 4.

14' is a vertical channel or groove on one of the inner faces of the socket 14 and adjacent to the end of this groove on the upper and lower face of 12 are bored small recesses 15 which are preferably slightly slanted or tipped away from the opening 14. This will be seen in Fig. 3. Within this groove 14' is laid a bowed leaf spring 36 of slightly less width than the channel 14' so as to be contained and guided therein. The spring 36 has at each end an ear 36' turned at an angle thereto. This ear is preferably somewhat circular to fit the recess 15. The spring 36 will, therefore, lie within the groove 14', having its central bowed portion exposed within the bearing 14, thus affording a frictional grip upon anything thrust therein.

16 is a stem of any desired length squared to fit the socket 14 of the ratchet piece 12.

17 are a pair of jaws having rounded ends formed on the stem 16, and 18 are similar jaws with similarly rounded ends formed on the stem 19.

20 is a cubical block to which the jaws 17 are pivoted on a bearing 21 slightly above its center, while the jaws 18 are similarly pivoted at 22 slightly below its center. This forms between the stem 16 and shank 19 a universal joint.

23 is a squared sleeve driven over the stem 19 to form a socket thereon.

24 is a kerf or slot cut through one wall of sleeve 23, and 25 is a bowed spring held in said slot by a cover piece 26 swaged into a groove surrounding the slot 24. As the slot passes through the inner face of the wall 23 the spring 25 frictionally engages anything thrust within the socket 23 as the stem 27 of a wrench 28. Only one socket carrying element 28 is shown, but obviously a great variety of shapes and sizes may be provide for different uses. It is not deemed necessary to illustrate all of these varieties.

The stem 16 may be of any length desired. This stem is made the same size as the socket 14 of the ratchet piece 12, so that the stem 27 of any socket carrying element 28 might be inserted directly into the socket 14, or might be set in the socket of a holder whose shank fitted the socket 14.

On account of the adjustability of the socket 14 with relation to the shank 16, or any similar shank, it will be seen that the ratchet can be adapted to a great variety of positions.

In use, the pawl 6 is set in either right or left hand position, according to whether the nut is to be screwed or unscrewed. This is accomplished by pulling on the end 7' of the stem 7 and giving the stem a rotation of 180°; the pawl will then assume the opposite phase and present its beveled end so that it will ride in the opposite direction. In each of its true positions it will be locked by the engagement of the pin 10 in the notches 9' of the ring 9.

In use the wrench may be used with the socket carrying element shown or the socket carrying element 28 may be applied to the wrench by inserting its stem 27 directly into the socket 14 of the ratchet piece 12. In doing this, the spring 36 would be com-

pressed within the groove 14', and to some extent the ears 36' would be slightly raised. They will not, however, be wholly disengaged from the recesses 15. We find in actual practice that it is very easy to place the spring 36 in its position in the groove 14' with its ears in the recesses 36', but it is practically impossible without the assistance of tools to again remove it from this engagement.

If the work to be accomplished has to be reached through intervening parts, it is desirable to introduce a stem piece. This may be a plain stem piece or a joined piece. We have shown in Fig. 1 a stem piece including between its ends a universal joint. In this case, therefore, the stem 27 of the socket carrying element 28 would be inserted within the socket 23, within which it would be held by the frictional engagement of the spring 25 exposed through the bottom of the slot 24. The ratchet piece 12 would be adjusted on the stem 16 at any position desired. On account of the frictional engagement of the spring 36 the stem 16 may similarly be pushed through the socket 14 and will be held at any point by the frictional engagement of the spring.

Various modifications may be made in the construction and operation of our ratchet, the nature and variety of the tools, and in the manner of assemblage and use of the same, all without departing from the spirit of our invention, if within the limits of the appended claim.

What we therefore claim and desire to secure by Letters Patent is:

In a ratchet wrench comprising a head having a ratchet piece, a pawl disposed for positive engagement with said ratchet piece, an operating member fastened to said pawl by a transverse pin, and a fixed member having a plurality of notches in one of which an end of the fastening pin is adapted to engage and lock said pawl in operative position.

In testimony whereof, we affix our signatures in presence of two witnesses.

LARROY S. STARRETT.
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Witnesses:

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