No. 648,572. Patented May 1, 1900.

J. B. PATTERSON.

RATCHET WRENCH.

(Application filed Nov. 28, 1896.)

(No Model.)

Fig. 1.

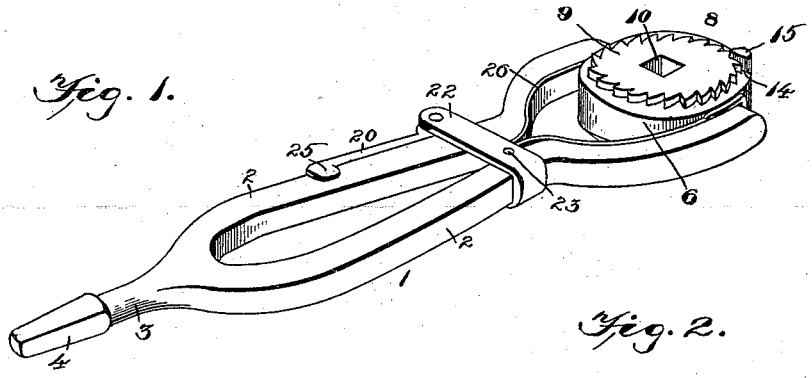


Fig. 2.

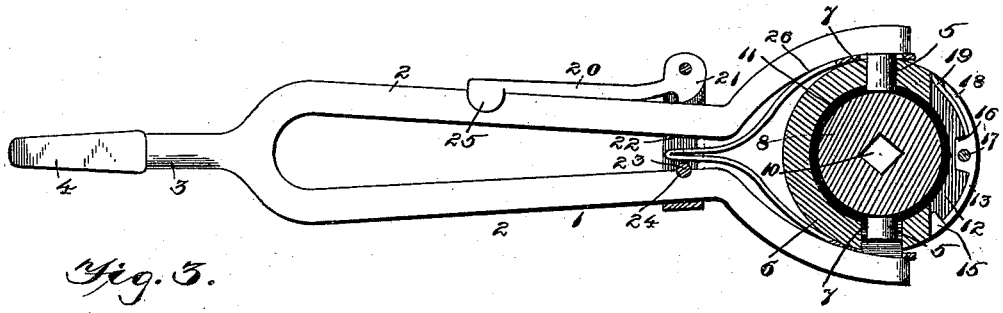


Fig. 3.

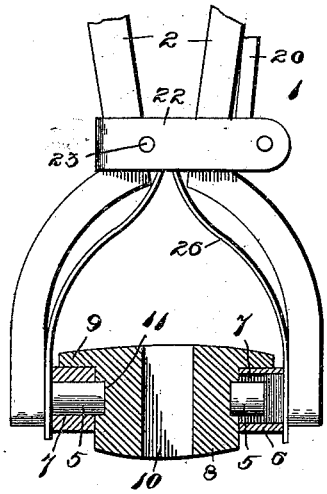
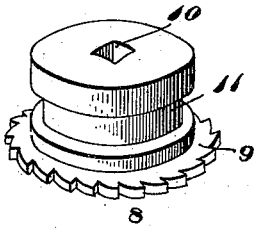


Fig. 4.



WITNESSES

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JABE B. PATTERSON, OF FAYETTEVILLE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOHN W. DULL, OF SAME PLACE.

RATCHET-WRENCH.

SPECIFICATION forming part of Letters Patent No. 648,572, dated May 1, 1900.

Application filed November 28, 1896. Serial No. 613,760. (No model.)

To all whom it may concern:

Be it known that I, JABE B. PATTERSON, a citizen of the United States, residing at Fayetteville, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Ratchet-Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in ratchet-wrenches.

One object of the invention is to simplify the construction of ratchet-wrenches whereby the same shall be rendered simple, durable, and efficient and adapted to quick adjustment to nuts and bolts of varying sizes.

A further object of the invention is to provide a wrench which is adapted to remain upon the nut or bolt until the same is screwed to the desired extent without the necessity of removing the wrench therefrom, as is the case with the ordinary monkey-wrench; and, furthermore, the invention contemplates a wrench which is adapted to be operated either by the direct application of the hand or through the medium of a brace.

With these objects in view the invention consists, substantially, in the construction, combination, and arrangement of parts, as will be hereinafter fully illustrated, described, and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a wrench constructed in accordance with the present invention and illustrated in closed position. Fig. 2 is a sectional plan view thereof. Fig. 3 is a transverse sectional view illustrating the wrench in position for use with a brace. Fig. 4 is a detail perspective view of a die adapted for use with the present invention.

Similar numerals of reference designate corresponding parts in all the figures of the drawings.

Referring to the drawings, 1 designates the handle or stock of the wrench, which comprises a plurality of substantially-parallel spring-arms 2, said arms being connected at one of their ends and having a shank 3 projecting from their point of juncture, said shank 3 having its outer end squared, as at 4, for the purpose of permitting a brace of approved construction being applied thereto.

The free ends of the parallel arms 2, near their extremities, diverge, and the extreme ends of said divergent portions are provided with inwardly-extending lugs 5, said lugs being at right angles to the divergent portions of the arms 2 and designed to form pivots for a purpose to be presently stated.

Arranged between the divergent portions of the parallel arm 2 is a die-holder 6, said die-holder preferably being in the form of a ring, and formed in the sides of the die-holder 6 are alined openings 7, which openings are adapted to receive the inwardly-projecting lugs 5, formed on the arms 2. It will be noted at this point that one of the lugs 5 immediately adjacent to its point of connection with the arm 2 is substantially cylindrical in form, and said cylindrical lug enters one of the openings 7, which opening is correspondingly shaped to enable the die-holder 6 readily turning thereon. The other lug 5, as it will also be noted, at its connection with its arm 2 is squared or of polygonal shape, and the opening 7 which this lug enters is correspondingly shaped, so that when the arms 2 are compressed to lock the die-holder into a rigid position the squared or polygonal portion of the lug 5 is forced into the square or polygonal opening 7, thereby preventing rotation of the die-holder 6 and holding the same in a rigid position.

Disposed within the die-holder 6 is a die 8, the latter being of a greater thickness than said die-holder, and one end of said die, as will be clearly seen, is of a greater diameter than the remaining portion of the same, and the edge of said enlarged portion is serrated to provide a ratchet-wheel 9, the central portion of the die 8 having an opening 10 for the reception of a bolt or nut to which the wrench is applied. The length of the lugs 5 is sufficient to project beyond the inner sides of the die-holder 6, and the die 8 is provided with a peripheral recess 11, which recess is designed

to receive the inner ends of the lugs 5 when the arms 2 are compressed, and by reason of said lugs entering the peripheral recess 11 said lugs will securely hold the die 8 within the die-holder 6.

In the outer side of the die-holder 6 a channel 12 is cut, in which is disposed a pawl 13, and one of the walls of the channel 12 is provided with a notch 14, through which projects a stud 15, carried by the pawl 13, adapted to engage with the teeth of the ratchet-wheel 9, and for this purpose said stud extends a sufficient distance beyond the die-holder 6 to insure positive engagement of said stud with said teeth.

The pawl 13 is provided with a shoulder 16, through which passes a pivotal pin 17, which pin also passes through the die-holder 6, and thus provides a secure connection for the pawl 13 with the die-holder. Projecting from the shoulder 16 of the pawl 13 is a shank 18, and interposed between said shank 18 and the inner wall of the channel 12 is a leaf-spring 19, said spring being designed to normally force the shank 18 outwardly, and hence press the stud 15 into engagement with the teeth of the ratchet-wheel 9, a rivet or its equivalent securely connecting the shank 18 with the spring 19.

For the purpose of compressing the spring-arms 2 and retaining the same in their compressed position a lever 20 is employed, said lever having at one of its ends a cam 21, which cam is pivotally secured between a U-shaped bracket 22, said bracket straddling the spring-arms 2, and in order that the bracket 22 may be held in a rigid position upon said arms a securing-pin 23 is passed through the sides of said bracket and enters a notch 24 on the inner side of one of the spring-arms 2. The open end of the bracket 22 projects beyond the outer sides of the arms 2, and in this opening the cam 21 is pivotally secured, and formed on the opposite end of the lever 20 is a pair of outwardly-projecting parallel ears 25, which embrace one of the arms 2 when the lever is in locked position and are designed for the ready manipulation of said lever. For further increasing the spring of the arms 2 a substantially U-shaped leaf-spring 26 is disposed therebetween, the central portion of said spring being formed into a point designed to pass between the arms 2 at substantially the point where the same diverge, and the outer ends of the spring 26 are provided with perforations through which the inwardly-projecting lugs 5 pass.

The operation and application of the herein-described wrench will be readily understood by those familiar with such devices.

When the wrench is desired for use by the direct application of the hand to the stock 1, the wrench is caused to assume the position shown in Fig. 1, and when in this position it is apparent that the die 8 may be easily turned by simply moving the stock 1 in the direction wherein the stud 15 of the pawl 13 will engage the teeth of the ratchet-wheel 9, thereby carrying said ratchet-wheel with the stud 15 and screwing the nut or bolt, as the case may be. By reversing the direction in which the stock 1 is operated the stud 15 will readily slide over the teeth of the ratchet-wheel 9 and the die 8 will remain in a stationary position, the die-holder 6 rotating with the arms 2, and thus being movable independently of the die 8. When it is desired to employ the wrench in connection with a brace, the lever 20 is swung open and away from the spring-arms 2, thereby releasing the cam 21 and permitting said arms to recede from each other. This will enable the die-holder 6 to be easily rotated upon the lugs 5 to a position at right angles to that shown in Fig. 1 or similar to that illustrated in Fig. 3, and by simply closing the lever 20 said lugs will be forced into the openings 7, and by reason of one of the said lugs being squared the same engages with its correspondingly-shaped opening and locks the die-holder in the position described, when a brace may be attached to the shank 3 of the arms 2 and the wrench be employed therewith. To remove the die from the holder 6 and replace the same by another, it is simply necessary to release the lever 20 similar to the operation just described and permit the arms 2 to recede from each other. By such operation the lugs 5 are caused to pass out of the peripheral recess 11 of the die, and thus enable the latter to be removed from the holder.

From the foregoing it is obvious that I have provided a ratchet-wrench which is durable and efficient and adapted for quick adjustment to nuts and bolts of varying sizes. It is further apparent that the wrench may remain upon a nut or bolt until the same is screwed to the desired extent without the necessity of removing the wrench therefrom, as is the case with the ordinary monkey-wrench, and finally that the wrench may be either operated by direct application of the hand or through the medium of a brace, all liability of the wrench slipping and thereby causing injury to the operator being overcome.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a wrench, the combination, with a plurality of arms, of a die-holder carried thereby, a die carried by said holder and provided with a peripheral recess, lugs formed on said arms and adapted to enter the die-holder and engage the peripheral recess of said die, and means for holding the arms in locked position, substantially as set forth.

2. In a wrench, the combination, with a plurality of arms, of a die-holder carried thereby, a die carried by said holder and having one of its edges serrated, a pawl carried by the die-holder and adapted to engage the

serrated edges of the die and impart motion thereto, and means for holding the arms in locked position, substantially as set forth.

3. In a wrench, the combination, with a plurality of arms, of a die-holder carried thereby and provided with alined openings, lugs formed on said arms and adapted to enter said alined openings, a die carried by said holder and adapted to be locked therein by said lugs, and means for holding the arms in locked position, substantially as set forth.

4. In a wrench, the combination, with a plurality of arms, of a die-holder carried thereby, a die carried by said holder and provided with a peripheral recess, lugs formed on said arms and adapted to enter said peripheral recess to lock the die within the holder, said die having its edges serrated, a spring-pressed pawl pivotally secured to the die-holder and adapted to engage the serrated edges of the die, whereby motion is imparted to said die, and means for compressing the arms to force the lugs into engagement with the die, substantially as set forth.

5. In a wrench, the combination, with a die-holder having a channel provided in its outer side, of a die carried by said holder and having one of its edges serrated, a pawl pivotally secured in the channel of the die-holder and provided with a stud adapted to engage the serrations of the die, whereby motion is imparted to the latter, said pawl also having a shoulder and a shank extending therefrom, and a spring interposed between said shank and the inner wall of the channel, whereby said shank is normally pressed outwardly and the stud of the pawl forced into engagement with the serrated edge of the die, substantially as set forth.

6. In a wrench the combination, with a plurality of arms having divergent portions provided with inwardly-projecting lugs, of a die-holder disposed between the divergent portions of said arms and provided with alined openings adapted to receive said lugs, a die carried by said holder and having one of its edges serrated, said die also being provided with a peripheral recess adapted to receive the lugs, whereby the latter are adapted to lock said die within said holder, a spring-pressed pawl carried by the holder and adapted to engage the serrated edge of the die to impart motion to the latter, and means for compressing the arms and holding the same in locked position, whereby the die-holder may be held at different angles to said arms, substantially as set forth.

7. In a wrench, the combination, with a plurality of arms having divergent portions provided with inwardly-projecting lugs, of a die-holder disposed between the divergent portions of said arms and provided with alined openings adapted to receive the said lugs, a die carried by said holder and having one of its edges serrated, said die also being provided with a peripheral recess adapted to receive the lugs, whereby the latter are adapted to lock said die within said holder, a spring-pressed pawl carried by the holder and adapted to engage the serrated edge of the die to impart motion to the latter, a U-shaped bracket straddling the arms and rigidly secured to one of the latter, and a cam-lever pivoted in the open end of said bracket and adapted to compress said arms and hold the same in locked position, substantially as set forth.

8. In a wrench, the combination, with a plurality of arms having divergent portions provided with inwardly-projecting lugs, one of said lugs being cylindrical and the other polygonal, of a die-holder disposed between the divergent portions of said arms and provided with alined openings adapted to receive said lugs, said alined openings conforming to the shape of the inwardly-projecting lugs, a die carried by said holder and having one of its edges serrated, said die also being provided with a peripheral recess adapted to receive the lugs, whereby the latter are adapted to lock said die within said holder, a spring-pressed pawl carried by the holder and adapted to engage the serrated edge of the die to impart motion to the latter, a U-shaped bracket straddling the arms and rigidly secured to one of the latter, and a cam-lever pivoted in the open end of said bracket and adapted to compress said arms and hold the same in locked position, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JABE B. PATTERSON.

Witnesses:
JOHN W. DULL,
J. NEVIN POMEROY.