

No. 853,930.

PATENTED MAY 14, 1907.

C. MILLER.
RATCHET WRENCH.
APPLICATION FILED OCT. 14, 1906.

Fig. 1.

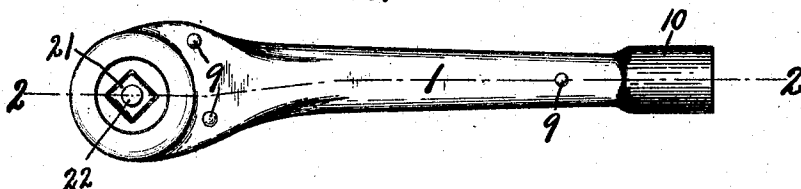


Fig. 2.

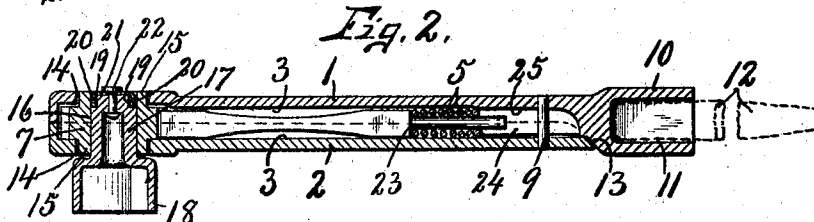


Fig. 3.

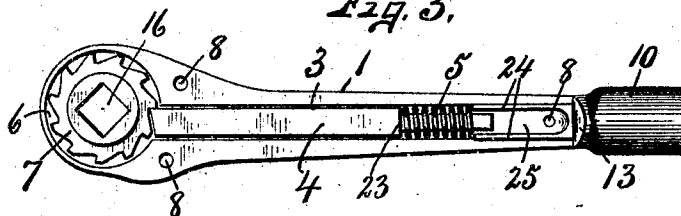


Fig. 4.

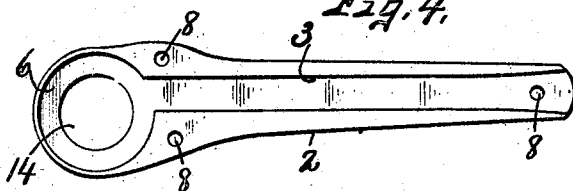


Fig. 5.



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RATCHET-WRENCH.

No. 853,930.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES MILLER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Ratchet-Wrenches, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in ratchet wrenches in which the handle is made hollow and composed of two opposite longitudinal sections secured together for inclosing and retaining the ratchet, pawl and its actuating spring.

I am aware that it is not broadly new to make the handle of a ratchet wrench in two parts containing the ratchet and its pawl and actuating spring, but I believe that I am the first to produce such a wrench in which one of the handle sections has an enlarged tubular end integral therewith for receiving various devices, such as sockets, screw drivers and other working tools, the use of which brings more or less torsional and lateral strains upon the walls of the tubular head.

I also believe that I am the first to provide the ratchet wheel and tubular head with openings of substantially identical form capable of receiving the shank of the same tool whereby such tool may be used in the ratchet wheel or in the tubular head.

A further feature of the novelty consists in providing the shank of the tool with a simple friction spring whereby the tool is frictionally held in its opening in the ratchet wheel or tubular head to prevent accidental displacement of the tool and also to permit it to be inserted into either end of the opening in the ratchet wheel.

My object, therefore, is to inclose the ratchet wheel, pawl, and its actuating spring within the split handle composed of two pieces riveted together in such a manner as to retain the operating parts and still leave a solid tubular head integral with one of the parts to receive tools and prevent any strains which would tend to separate the handle sections from each other.

Another object is to make the parts of the ratchet wrench as simple and compact with as few parts as practicable so as to reduce the cost of manufacture and still enable the wrench to be adapted to a variety of uses. I have, therefore sought not only to increase the utility of the wrench but also to strengthen its parts in the manner previously described

and also by affording a comparatively long longitudinal bearing for the pawl without adding materially to the length of the handle, this being accomplished by reducing the end of the pawl which is encircled by the spring and providing a groove in which the adjacent end of the pawl may play endwise.

Other objects and uses will appear in the following description.

In the drawings,—Figure 1 is a top plan of my improved ratchet wrench. Fig. 2 is a longitudinal sectional view taken on line 2—2 of Fig. 1. Fig. 3 is an inner face view of one of the handle sections having the tubular head and showing in operative position the ratchet wheel, pawl and actuating spring. Fig. 4 is an inner face view of the shorter opposite handle section. Fig. 5 is a perspective view of the detached friction plate and washer with which each tool is provided.

In carrying out the objects stated I provide a hollow handle consisting of two parts—1— and —2—, each having a lengthwise groove—3—in which is seated and guided a suitable pawl—4—and spring—5—, the corresponding end of each section being enlarged and provided with a circular recess—6— forming an annular chamber in which is rotatably mounted a ratchet wheel—7—, Figs. 2 and 3. These handle sections—1— and —2— are provided with registering apertures—8— receiving suitable fastening means, as rivets—9— by which said handle sections are permanently secured together face to face and both being of the same depth it is evident that they meet in a longitudinal plane substantially midway between their upper and lower faces, the handle being thus divided through its longitudinal center through the greater portion of its length. The end of the section—1— opposite to that in which the ratchet wheel—7— is mounted is enlarged forming a tubular head—10— having an opening or socket—11— extending inwardly from its outer end a suitable distance for receiving and supporting a tool, as a screw-driver—12—, indicated by dotted lines in Fig. 2. This tubular head—10— is formed integral with the handle section—1—, and extends laterally beyond the meeting faces of the handle sections and also beyond the adjacent end of the handle section—2— thereby forming an abutting face or shoulder—13— against which the adjacent end of the handle section—2— abuts. It, therefore, follows

that the handle section —2— is somewhat shorter than the handle section —1— and that by forming the tubular head —10— integral with the handle section —1— the longitudinal division of the handle terminates short of the tubular head thus avoiding any division or joints in such head and materially increasing its strength to resist torsional and lateral strains incidental to the use of a tool in the socket —11—.

The ends of the handle sections —1— and —2— in which the ratchet wheel —7— is located are formed with registering circular openings —14— of the same size or diameter and the ratchet wheel —7— is formed with opposite reduced hubs —15— which are journaled in said openings —14—, thus permitting the ratchet wheel to be reversed end for end if desired. This ratchet wheel is provided with a central angular (usually square) opening —16— for receiving a similarly formed angular shank —17— of a wrench socket —18—. The upper end of the shank —17— is reduced in width forming recesses —19— in the opposite faces for receiving the turned ends —20— of a spring friction washer —21—, which latter is secured to the top of the shank —17— by suitable fastening means, as a rivet —22—.

The spring ends —20— of the washer —21— are convexed and tensioned outwardly so as to normally lie a slight distance beyond the planes of the adjacent sides of the shank —17—. It is, therefore, obvious that when the shank —17— is inserted endwise into the opening —16— the ends of the spring —21— will be compressed by the sides of the said opening thereby frictionally holding the wrench socket —18— in operative position and at the same time permitting it to be easily removed when desired.

In like manner any other tool which it may be desired to insert into the opening —16— or —11— may be equipped with a similar friction washer —21—.

It will be seen upon reference to Figs. 2 and 3 that the pawl —4— is of considerable length and that its outer end nearest the tubular extension —10— is reduced in diameter forming a shoulder —23— against which one end of the spring —5— abuts, while the other end of the said spring bears against the ends of the opposite ribs —24— which are integral with the handle section —1— and project into the groove —3— of the handle section —2—, thereby locking the two handle sections together against independent lateral displacement and at the same time these ribs are spaced apart a sufficient distance to form a lengthwise groove —25— in which the reduced end of the pawl —4— may freely play.

In assembling the parts of my invention

the working parts, such as the ratchet wheel —7—, pawl —4— and spring —5— are placed in operative position in the groove —3— of the handle section —1—, with the spring —5— interposed between the shoulder —23— of the pawl —4— and adjacent ends of the ribs —24—, after which the shorter handle section —2— is placed in operative position upon the handle section —1—, with the ribs —24— projecting into its groove —3—, whereupon the rivets —9— are inserted in their respective apertures —8— and upset to permanently secure the two handle sections together leaving the tubular extension —10— undivided and without joints. The ratchet socket —18— may then be inserted in the opening —16— and hold by friction the washer —21— or such wrench socket may be inserted in the opening —11— of the enlarged tubular extension —10— at the opposite end of the handle. This latter opening —11— forms a convenient means for receiving and supporting various tools which may be used to give additional leverage to the wrench or may be adapted for special work.

Having thus fully explained my invention, what I claim and desire to secure by Letters Patent is:

1. A device of the character described comprising a handle, a head provided with ratchet teeth rotatably mounted in one extremity of said handle, said handle comprising two members each of which is provided with a longitudinal groove extending throughout the greater part of the length of said members, a pawl having a reduced end slidably mounted in said groove, a coil spring surrounding the reduced portion of said pawl, said coil spring bearing against a shoulder formed on said pawl, and oppositely disposed ribs arranged within said grooves, near the rear extremity thereof.

2. A device of the character described comprising a handle, a head provided with ratchet teeth rotatable in said handle, said handle comprising two members, each of which is provided with a longitudinal groove extending throughout the greater portion of its length, a pawl mounted in said groove and engaging with the ratchet teeth on said rotatable head, a plurality of oppositely disposed ribs carried in the rear end of said groove, and means engaging with said pawl and said rib for retaining said pawl in engagement with said ratchet teeth.

In witness whereof I have hereunto set my hand this 11th day of September, 1905.

CHARLES MILLER.

Witnesses:

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