No. 714,586. Patented Nov. 25, 1902.

F. F. LANDIS.

RATCHET WRENCH.

(Application filed Feb. 7, 1902.)

(No Model.)

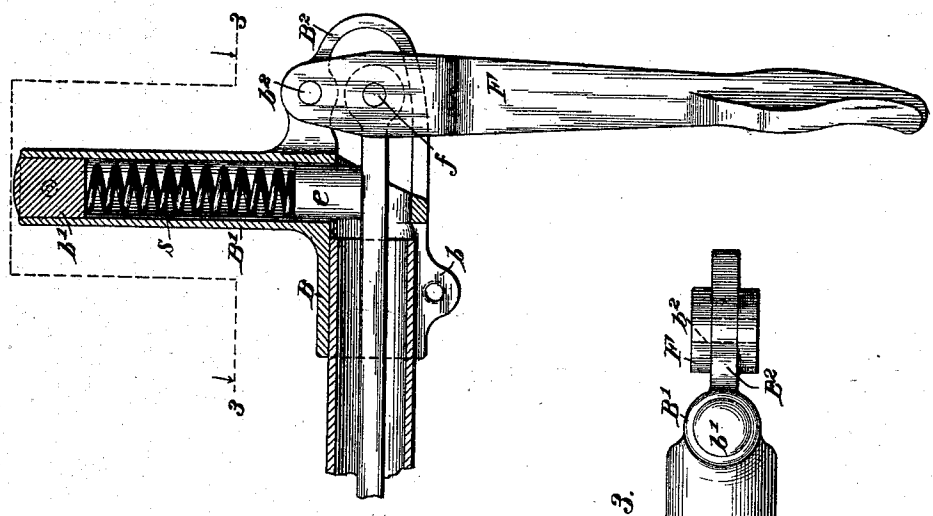


Fig. 3.

Fig. 2.

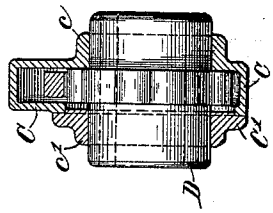
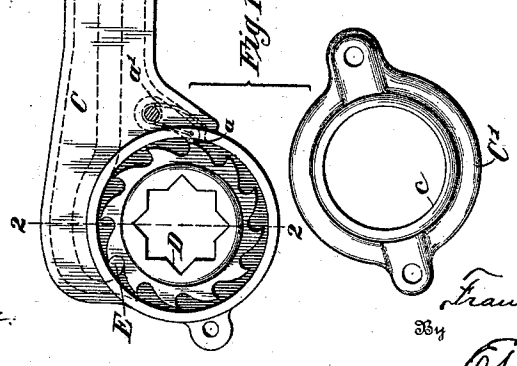


Fig. 1.



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UNITED STATES PATENT OFFICE.

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RATCHET-WRENCH.

SPECIFICATION forming part of Letters Patent No. 714,586, dated November 25, 1902.

Application filed February 7, 1902. Serial No. 93,016. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. LANDIS, a citizen of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Ratchet-Wrenches, of which the following is a specification.

My said invention consists in various improvements in the construction and arrangement of parts of ratchet-wrenches, the object being to provide a wrench of this character which shall be capable of convenient operation, possessed of great power, and especially adapted for use in manipulating nuts difficult to reach with an ordinary wrench, such as the nuts on the shanks of the teeth of a threshing-machine cylinder, which are inside said cylinder and are manipulated with great difficulty and inconvenience with an ordinary wrench.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a view, partly in section and partly in side elevation, showing one of my improved wrenches, a portion of the stem being broken out to permit the parts to be shown on a larger scale and the cap of the lower housing being removed to show the interior construction more clearly; Fig. 2, a cross-section on the dotted line 2 2 in Fig. 1, the ratchet being shown in elevation; and Fig. 3, a view looking downwardly from the dotted line 3 3 in Fig. 1.

In said drawings the portion marked A represents the middle or main portion of the stem; B, a housing on its outer end for supporting the handle and operating-lever; C, a housing on its other end containing the wrench-spool; D, said spool; E, the pawl, and F the operating-lever.

The part A is a tube of whatever length desired to make the tool of the proper length for the work for which it is designed. It may be any character of tube suitable for the purpose, such as ordinary gas or water pipe. The housing B is attached to the outer end of said tube or stem by any suitable means, such as being split on one side and having ears *b* for a clamping-bolt. On one side is formed a handle B′, projecting at right angles thereto, being preferably hollow, with a plug *b′* in its outer end. A bow-shaped brace B^2 projects from its outer end, extending from one side to the other of said housing and preferably cast in piece therewith. The housing C is also a hollow casting attached to the other end of the tube A by a screw-threaded or any other suitable connection. It is of appropriate form and has one side open and provided with a cap C′, secured thereto by bolts extending through ears formed on the respective parts, as shown. An opening is formed in said cap and the center of the opposite wall of the housing, forming bearings for the ends of the wrench-spool, flanges *c* and *c′* being formed around these openings, respectively, to afford better bearing-surfaces for the journals of the spool.

The wrench-spool D has a central opening which is of an octagon shape and allows spool D to be in position to pass over the nut at any of the eight points or every forty-five degrees of the revolution of the spool D. This form of opening in said spool gives double the number of surfaces which can be brought into use on a square nut, and the wrench will wear twice as long as one with only four corners. This form of opening will also make it much less tedious to place the spool over a nut when at a difficult place to operate such nut. Around the outside of said spool and at its center is formed the circular ratchet *d*. On each side of said ratchet are formed the journals *d′*, which are mounted in the bearings *c* and *c′* of the housing C. A spring-pawl *a* is pivoted inside the housing C and normally held by the spring *a′* into engagement with the ratchet and holds the spool against backward movement.

The pawl E is of a hook form, adapted to slide over the backs of the teeth of the ratchet and engage under said teeth. It is formed on the end of a rod of a length to extend back to near the outer end of the housing B, where it is pivotally connected to lever F. Adjacent to the hollow handle B′ it is provided with a transverse projection *e*, which extends into said handle somewhat and furnishes a yielding bearing for one end of a coiled spring S, the other end of which bears against the plug *b′*, or the said projection *e* forms a yielding bearing between the inner end of spring S and the side of the shank of the pawl E.

The tension of the spring S in handle B′ being thus against the pawl E at a point near the pivot *f* in handle F, in addition to the elasticity of the shank of the pawl itself (on account of its length) gives a very durable, simple, and positive means for holding the pawl onto the teeth of the ratchet and offers very little resistance when the pawl is moved over the backs of the teeth.

The lever F is of any appropriate form, being shown as bifurcated and mounted straddle of the brace B^2, to which it is pivoted on the pivot b^2 at a point adjacent to the handle B′. Between the sides of brace B^2 it is pivoted to the end of the shank of pawl E on the pivot *f*. The outer end or loop of said brace serves as a stop to limit the motion of said pawl and lever, being arranged to stop the motion before the pawl shall pass back of the point where it will have a secure engagement with the tooth of the ratchet, and thus avoid danger of breaking the parts.

The center of the spool D being to one side of the body on connection A, between the operating end of the complete wrench and the spool D, is of very great advantage in a wrench of this class, as the nuts in threshing-machine cylinders are always placed in rows parallel with the axis of the cylinder, and in order to place the spool D over the nuts to be tightened the body A of the wrench must be parallel with the different rows, while the center of the spool D must be around the nut or on the center of the rows of nuts. A wrench of this character, having the center of body A in line with the center of spool D, would be of little or no value for the work for which this wrench is particularly intended, the nuts being in rows in the direction that you must enter the wrench the bolts and nuts in advance of the one operated on would always interfere with the body of the wrench unless the spool D would be of sufficient length to project beyond the side of the housing C to raise the body above the ends of the bolts which receive the nuts. Such a construction would require too much length of the spool D to admit it being used in many places where a wrench is necessary.

In use, in putting on nuts, the wrench is placed over the nut, the operator holds the tool in one hand by the handle B′ and with the other hand manipulates the lever F until the nut is driven up as tightly as desired. In removing them the wrench is simply turned over and its other side engaged, when the manipulation of the lever will rapidly draw off said nut. Any back motion of the spool is prevented by the pawl *a*. By means of such a tool the operator can stand at one end of a threshing-machine cylinder and put in place or remove every nut belonging therein rapidly and conveniently, and by reason of the great power afforded can with ease secure the nuts more tightly than it has been possible to do with the old form of wrenches and remove nuts easily and quickly which have heretofore required much time and annoyance to remove with hammer and cold-chisel.

While I regard this invention as of particular value for the use indicated, there are of course many other places where it can be used to great advantage not necessary to enumerate.

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

1. A ratchet-wrench comprising a hollow stem or body, a wrench-spool journaled in one end thereof and having a ratchet-face, a pawl adapted to engage with said ratchet and having a shank extending through said hollow body to its other end, and a lever pivoted at one end to one side of said body and extending across its end and pivotally attached to said shank, substantially as set forth.

2. In a ratchet-wrench, the combination, of the hollow body, the wrench-spool journaled in one end thereof and provided with a circular ratchet, a pawl for engaging said ratchet having a shank which extends through said hollow body to its other end, a lever pivoted to said body and to the end of said shank, a transversely-extending handle, and a spring mounted therein and bearing against said shank to hold the pawl normally in engagement with said ratchet, substantially as set forth.

3. In a ratchet-wrench, the combination, of the hollow body, the wrench-spool journaled in one end thereof, a spring-pawl for holding said spool against back motion, an operating-pawl engaging with the ratchet on said spool and having a shank pivoted to an operating-lever, said lever pivoted to one side of said body, and a stop to limit the outward motion of said lever and pawl, substantially as set forth.

4. In a ratchet-wrench, the combination of the hollow body composed of the central part A of the stem, the housing B on its outer end for supporting the handle and operating-lever and the housing C on the other end for containing the wrench-spool, the wrench-spool mounted in appropriate bearings in part C, the pawl E adapted to engage a ratchet on said spool, the part B being provided with an appropriate handle and a brace B^2, and the lever F pivoted to one side of said brace and attached to the shank of said pawl within said brace, substantially as set forth.

5. In a ratchet-wrench, the combination, of the body, the wrench-spool journaled in one end thereof, a ratchet on said spool, a pawl adapted to reciprocate in said handle and to engage said ratchet, and a lever for operating said pawl.

6. A ratchet-wrench formed with a hollow stem having a housing for the wrench-spool on one end thereof, its center being set off to one side of the center of said stem, the wrench-spool with ratchet thereon journaled in bear-

ings in said housing, a pawl engaging said ratchet, and a lever for operating said pawl, substantially as set forth.

7. A ratchet-wrench comprising a housing for the wrench-spool, a stem thereto, a wrench-spool having a circular ratchet, journaled in said housing, a pawl engaging with one side of said ratchet, and a lever for operating said spool, said spool being formed to engage the nuts from either side, whereby by reversing sides of the wrench the nut may be driven in either direction, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Waynesboro, Pennsylvania, this 16th day of January, A. D. 1902.

FRANK F. LANDIS. [L. S.]

Witnesses:
MARK H. LANDIS,
ALF. N. RUSSELL.