E. F. CAMUS.

SOCKET RATCHET WRENCH.

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1,106,545. Patented Aug. 11, 1914.

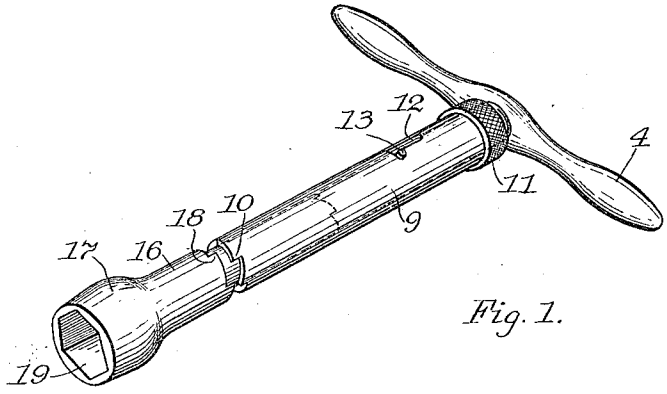


Fig. 1.

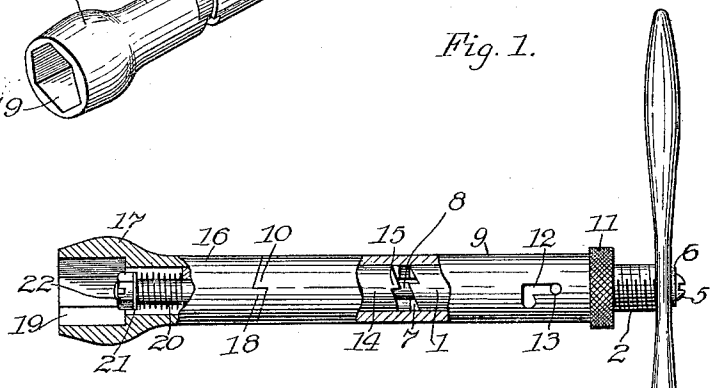


Fig. 2.

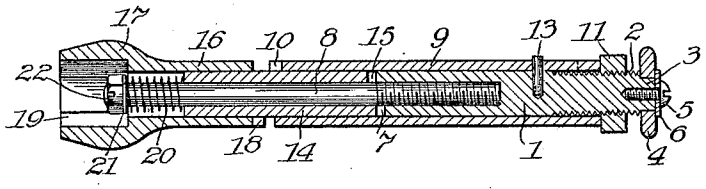


Fig. 3.

WITNESSES

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SOCKET RATCHET-WRENCH.

1,106,545. Specification of Letters Patent. Patented Aug. 11, 1914.

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To all whom it may concern:

Be it known that I, EMILE F. CAMUS, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Socket Ratchet-Wrenches; and I do 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, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to socket ratchet wrenches, and consists in the construction and arrangement of parts as hereinafter more fully set forth and pointed out particularly in the claims.

The object of the invention is to provide a simple and efficient socket wrench to be used by hand in setting up or withdrawing nuts on threaded bolts, in which the construction is such as to enable an intermittent rotation of the nut in either direction through an oscillatory movement imparted to the handle of the wrench, in such manner as to obviate the necessity for withdrawing the socket head of the wrench from the nut, or the shifting of the hand upon the handle of the wrench in effecting the rotation of the nut in either direction.

A further object of the invention is the provision of means for quickly effecting an adjustment of the ratchet driving means whereby the driving direction of the wrench may be reversed at will by the operator so as to direct the rotation of the nut in either a right or left-hand direction while in operation.

The above objects are attained by the employment of the structure illustrated in the accompanying drawings, in which,

Figure 1 is a perspective view of the wrench as it would appear when set for operating the socket head in the right-hand direction. Fig. 2 is a plan view of the wrench adjusted for operation in rotating the nut in the left-hand direction, a portion of the body and socket of the wrench being broken away to show the internal arrangement of the parts. Fig. 3 is a central longitudinal section taken through the wrench when set to operate in the right-hand position, as shown in Fig. 1.

Referring to the drawings by the characters of reference marked thereon, 1 designates the driving stem of the wrench which is exteriorly screw threaded as at 2 at one end and terminates in a squared shank 3 adapted to be received by a squared aperture in the handle 4, upon which said handle is rigidly secured and held against withdrawal by means of a screw 5 threaded into the end of said stem and engaging a washer 6 in contact with the outer face of said handle. The inner end of the stem 2 is provided with a series of ratchet teeth 7 formed longitudinally and circumferentially therein, and extending into the body of said stem is a screw threaded aperture into which one end of a screw threaded stem 8 is rigidly secured to form a reduced extension with the stem 1.

Mounted to slide freely upon the driving stem 1 is a shell or sleeve 9, one end of which projects beyond the inner ratchet toothed end of said stem and is provided with a series of ratchet teeth 10 therein, which are disposed in reverse relation circumferentially of said stem with respect to the teeth of the stem 1. The rear end of the sleeve 9 is adapted to abut against a knurled thumb nut 11 mounted on the screw threads 2 of the stem 1. Extending through the wall of the sleeve 9 near the rear end thereof is an L-shaped aperture 12 through which a pin 13 passes that is rigidly secured at one end in the body of the stem 1. Said pin together with the L-shaped aperture 12 limits the longitudinal movement of the sleeve 9 and serves in the manner of a bayonet lock in conjunction with the nut 11 for confining said sleeve against movement upon the stem 1 when shifted and engaged with said nut and pin at either end of said L-shaped aperture.

Mounted to slide freely on the body of the stem 8 and adapted to enter freely within the end of the sleeve 9 is a bushing 14, which is provided at its inner end with a

series of ratchet teeth 15 adapted to register and mesh with the ratchet teeth 7 of the stem 1. The outer end of the bushing 14 is secured rigidly within a stem 16 of a socket wrench head 17. The end of the stem 16 of said head is provided with a series of ratchet teeth 18 adapted to register and mesh with the ratchet teeth 10 of the sleeve 9. The outer end of the socket head 17 is provided with an aperture 19 of suitable shape and size to receive the nut to be turned.

As a means of holding the socket head and its bushing 14 against withdrawal from the stem 8, and to yieldably hold the ratchet teeth thereon in contact with the ratchet teeth of the stem 1 and sleeve 9, a coiled spring 20 is interposed between the outer end of the bushing 14 and a washer 21 secured on the end of said stem by means of a lock nut 22 thereon, whereby the expansive force of the spring 20 exerts an outward tension upon the stem 8 and an inward tension upon the bushing 14 carrying the ratchet teeth thereon into yielding contact with the ratchet teeth of the stem 1, when the sleeve 9 is shifted to the position with the pin 13 in engagement with the foot portion of the L-shaped slot 12, as shown in Figs. 1 and 3. In this position the wrench is set to rotate the socket head in the right-hand direction through the succesive engagement of the ratchet teeth 7 with the ratchet teeth 15 by an oscillatory motion imparted to the stem 1 through the handle 4.

To reverse the driving direction of the socket head of the wrench, the nut 11 is backed away from the end of the sleeve 9 and said sleeve is slightly rotated to disengage the pin 13 of the stem 1 from the foot of the L-shaped slot 12 in said sleeve. The nut is then screwed against the end of the sleeve to force said sleeve longitudinally of the stem 1 and carrying the ratchet teeth 10 thereon into engagement with the ratchet teeth 18 of the socket head 17. The bushing 14 of said head will be carried against the tension of the spring 20 longitudinally upon the stem 8, causing the ratchet teeth 15 thereon to disengage from the teeth 7 of the stem 1, as said sleeve reaches the limit of its end movement by contact of the pin 13 with the end of the L-shaped aperture 12. Said sleeve will then be locked extended against the tension of the spring 20, through engagement of its ratchet toothed end with the ratchet teeth of the socket head 17, by contact with the face of the knurled nut 11; thus the right-hand ratchet teeth 7 and 15 will be held out of engagement and the left-hand ratchet teeth 10 and 18 of the sleeve and socket head, respectively, will be held in yielding engagement under the tension of the spring 20, whereby an oscillating movement of the handle 4 will impart a left-hand rotary movement to the socket head 17 of the wrench, as clearly shown in Fig. 2.

It will be apparent from the foregoing description of the construction and arrangement of parts, that by merely shifting the sleeve 9 longitudinally of the stem 1, and engaging the L-shaped aperture therein in contact with the pin 13 by jamming the knurled nut 11 against the end of said sleeve, the wrench may be quickly and conveniently set to drive in either direction or reversed to drive in the opposite direction without necessitating the removal of the wrench from the nut or changing the position of the hand upon the handle of the wrench.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. A socket ratchet wrench comprising a stem having ratchet teeth thereon, a sleeve having ratchet teeth thereon mounted to slide longitudinally on said stem, a bushing slidably mounted in the end of said sleeve and having ratchet teeth adapted to engage the ratchet teeth of said stem, a socket head on said bushing having ratchet teeth adapted to engage the ratchet teeth of said sleeve, means for holding said bushing slidably with tension against outward movement in said sleeve, means for limiting the longitudinal movement of said sleeve on said stem, and means for locking said sleeve against movement on said stem.

2. A socket ratchet wrench comprising a stem having ratchet teeth thereon and adapted for attachment to a wrench handle, a sleeve slidably mounted on said stem and having ratchet teeth in one end thereof, a bushing slidably mounted on said stem and having ratchet teeth in one end thereof adapted to engage the ratchet teeth of said stem, a socket head on said bushing having ratchet teeth adapted to engage the teeth of said sleeve, means for holding said bushing slidably against tension on said stem, means for permitting a limited longitudinal movement of said sleeve on said stem, and means for locking said sleeve at the limit of its longitudinal movement with said stem.

3. A socket ratchet wrench comprising a stem having ratchet teeth thereon and adapted for attachment to a wrench handle at its outer end and having a reduced extension at the inner end thereof, a sleeve slidably mounted on said stem and having ratchet teeth on one end thereof projecting beyond the ratchet teeth on said stem, a bushing surrounding the reduced portion of said stem slidably mounted in the end of said sleeve and having ratchet teeth in the end thereof adapted to engage the ratchet teeth of said stem, a socket head on said bushing having ratchet teeth adapted to en-

gage the ratchet teeth of said sleeve, a slot in said sleeve, a pin in said stem engaging said slot, a threaded nut on said stem adapted to engage the end of said sleeve, a spring on the reduced extension of said stem engaging at one end with said stem and at its opposite end with the end of said bushing, whereby said bushing and head are slidably held in yielding engagement with said stem and sleeve.

In testimony whereof, I sign this specification in the presence of two witnesses.

EMILE F. CAMUS.

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