(No Model.)

R. L. FOSBURGH & J. F. MILLIGAN.

NUT WRENCH.

No. 455,484. Patented July 7, 1891.

Fig. 1.

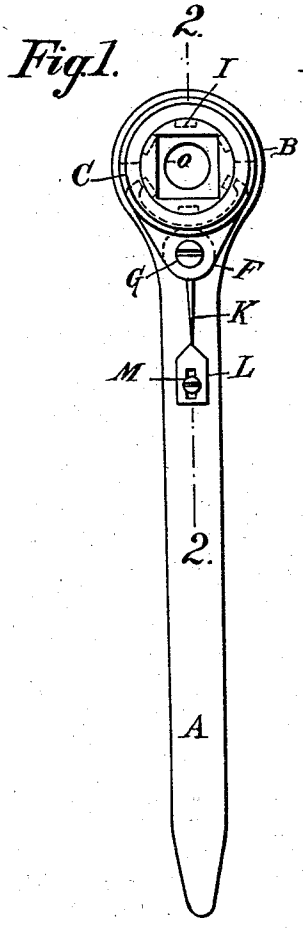


Fig. 2.

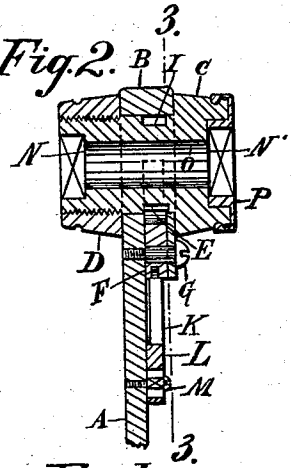


Fig. 3.

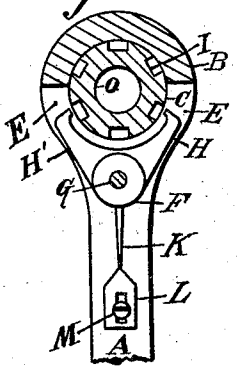


Fig. 4.

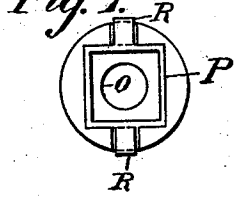
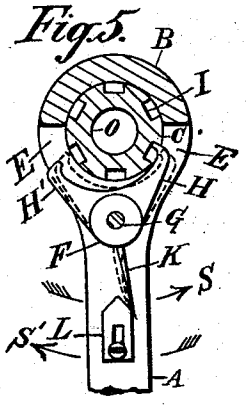


Fig. 5.



Witnesses.
Jos. W. Crooker.
A. Rannel.

Inventors.
Robert L. Fosburgh
John F. Milligan by
Paul Bakewell,
their attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ROBERT L. FOSBURGH AND JOHN F. MILLIGAN, OF ST. LOUIS, MISSOURI.

NUT-WRENCH.

SPECIFICATION forming part of Letters Patent No. 455,484, dated July 7, 1891.

Application filed February 18, 1891. Serial No. 381,931. (No model.)

To all whom it may concern:

Be it known that we, ROBERT L. FOSBURGH and JOHN F. MILLIGAN, citizens of the United States, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Nut-Wrenches, of which the following is a full, clear, and exact description.

Our invention relates to ratchet-wrenches, and has for its object to facilitate the putting on or taking off of nuts in places where it is difficult to get at them; and it consists in novel mechanism in such a wrench adapting it to be operated by a ratchet and pawl in either direction, so that it may be turned continuously in the desired direction without removing the wrench from the nut or bolt to which it is applied by a forward and backward movement of the handle, and in devices as attachable to a non-adjustable wrench, adapting it to be used on different-sized nuts.

In the accompanying drawings, in which like letters of reference denote like parts in the several figures, Figure 1 is a plan view of our improved wrench. Fig. 2 is a longitudinal vertical section taken as on the line 2 2 in Fig. 1. Figs. 3 and 5 are longitudinal horizontal sections of the wrench as shown in Fig. 1, taken as on the line 3 3 in Fig. 2; and Fig. 4 is a plan view of one end of the hub portion of the wrench, showing the application of one of the reducing-dies, hereinafter described.

The handle A is formed with an enlarged end part B, which is somewhat thicker than the rest of the handle, as shown in Fig. 2. The end B is formed with a central circular hole, (see Figs. 3 and 5,) into which is revolubly fitted the radially-reduced portion of the hub-shaped head C, which is secured therein by having the exterior collar D screwed onto or otherwise secured to the reduced portion of the head C, thereby securing the handle between the collar and the shoulder on the head C, as shown in Fig. 2. The thick portion of the handle A is slotted out at E at right angles to the head C when placed therein, as shown in Fig. 2, to a convenient depth toward that end of the handle, as shown in Figs. 3 and 5. Into this slot E is fitted the bifurcated pawl F, and pivotally secured therein, as shown in Figs. 2, 3, and 5, by the pivot bolt or screw G, so that its two legs H and H′ embrace the hub-head C in such manner that the ends of either of the legs can engage with the removable head C by dropping into the recesses I, cut in the circumference of the hub-head C at a point in the length thereof corresponding with the position of the pawl F, when the head C is placed and secured in the handle A, as shown in Fig. 2.

To the middle portion of the pawl F is secured the flat spring K, extending lengthwise to the handle A. The free end of the spring K is in a position to engage with and be pushed to one side or the other by the wedge-shaped tilting-block L, which is secured to the handle A so that it can be slipped longitudinally toward and from the spring K. The retaining-screw M is made square-bodied, as shown in Fig. 2, in order to prevent the block L from twisting thereon for the reasons that will obviously appear from the following description of the operation of our wrench. Both ends of the head C are formed with flat-bottomed countersunk square holes N N′, as shown in Fig. 2. These holes are of a different size relatively, the difference being preferably that which it would not be convenient to make by the insertion of the reducing-dies, as hereinafter described. The head C is also formed with a central hole O, preferably circular, extending from end to end, as shown in Figs. 1 and 2.

Each of the countersunk holes N and N′ is fitted with a set of reducing-dies P of different thicknesses. These dies are retained in position within the countersinks by any convenient means, preferably by forming the dies with or securing thereto laterally-extending bent clip-springs R, adapted to overlap the end of the head C, and their ends be sprung into a circumferential groove cut in the side of the head C, as shown in Figs. 2 and 4. The object of the dies P is to adapt the same wrench to be used on different-sized nuts.

The object in having the central hole O extend from end to end of the head C is twofold—first, in order to make provision for the end of the bolt if it projects beyond the nut when the nut is screwed home, and, second, in order to adapt the wrench to be used as a drill-wrench, permitting the shank of the drill to

be inserted in the same, allowing its ends to project from either end of the head C, forming the shank of the drill, with a square to fit into the countersinks N or N′, whereby the same can be turned.

The operation of our wrench is as follows: Having applied the wrench to the nut to be screwed on or off the bolt, the nut being entered in one of the countersunk recesses N or N′, (the one which it more nearly fits,) and, if necessary, a die P being secured therein to make the wrench fit the nut, the head C and the handle A will be relatively independent—that is, the handle can be revolved without turning the head as long as the tilting-block L is withdrawn from the spring K, permitting the spring K to assume a normally central position, and with it the bifurcated pawl F a position of non-engagement with the ratchet notches or recesses I, formed in the circumference of the head C, the position shown in Fig. 3. When it is desired to turn the head, and with it the nut let therein, the spring K is pushed over to one side, (to the right, as shown in Fig. 5, when it is desired to turn the head with the handle in that direction—that of the arrow S in Fig. 5,) and the slipping tilting-block L is pushed forward. (See Fig. 5.) When it is desired to get a new hold or bite on the head, the handle A is swung backward, (in the direction of the arrow S′ in Fig. 5,) the elasticity in the spring K permitting the end of the pawl-leg H to slip out of the recess I over the relatively raised portion of the body of the head C into the next recess, as is indicated in dotted lines in Fig. 5. If it is desired to turn the head C with the handle A in the other direction, (that of the arrow S′ in Fig. 5,) the tilting-block L is withdrawn and the spring K thrown to the other side, the tendency then being to throw the end of the pawl H′ into the recess I and carry the head C with the handle A in that direction.

As will be obvious from the description and the uses to which we expect to put our wrench, as implied by the specification, the form of the countersunk recesses N and N′ is a matter of convenience, and that they could as well be hexagonal or octagonal as square, as shown; and, further, it is obvious that the spring K and the tilting-block L might be dispensed with and the pawl F be operated by hand, some handle convenient to operate the pawl being secured thereto.

We claim—

1. In a ratchet nut-wrench, a handle in which is revolubly secured a nut-turning head, a bifurcated pawl pivotally secured to said handle with its two legs embracing said head and adapted to engage with said head in recesses formed in the circumference of the same, in combination with a spring attached to said pawl and a wedge-shaped sliding block secured on said handle capable of engaging with said spring, combined and operating substantially as described, and for the purposes specified.

2. In a nut-wrench, a handle to which is secured a double-ended nut-turning head formed with relatively different-sized non-adjustable countersunk nut-receiving recesses, in combination with the reducing-dies removably secured within said recesses, and retaining clip-springs secured to said reducing-dies, adapted to be sprung into a recess or groove formed therefor in the said head-piece, combined and operating substantially as described, and for the purposes specified.

3. In a ratchet nut-wrench, handle A, head C, collar D, bifurcated pawl F, recesses I, spring K, tilting-block L, and retaining-screw *m*, combined and operating substantially as described, and for the purposes specified.

In testimony whereof we have affixed our signatures, in presence of two witnesses, this 12th day of February, 1891.

ROBERT L. FOSBURGH.
JOHN F. MILLIGAN.

Witnesses:
A. RAMES,
JOS. W. CROOKES.