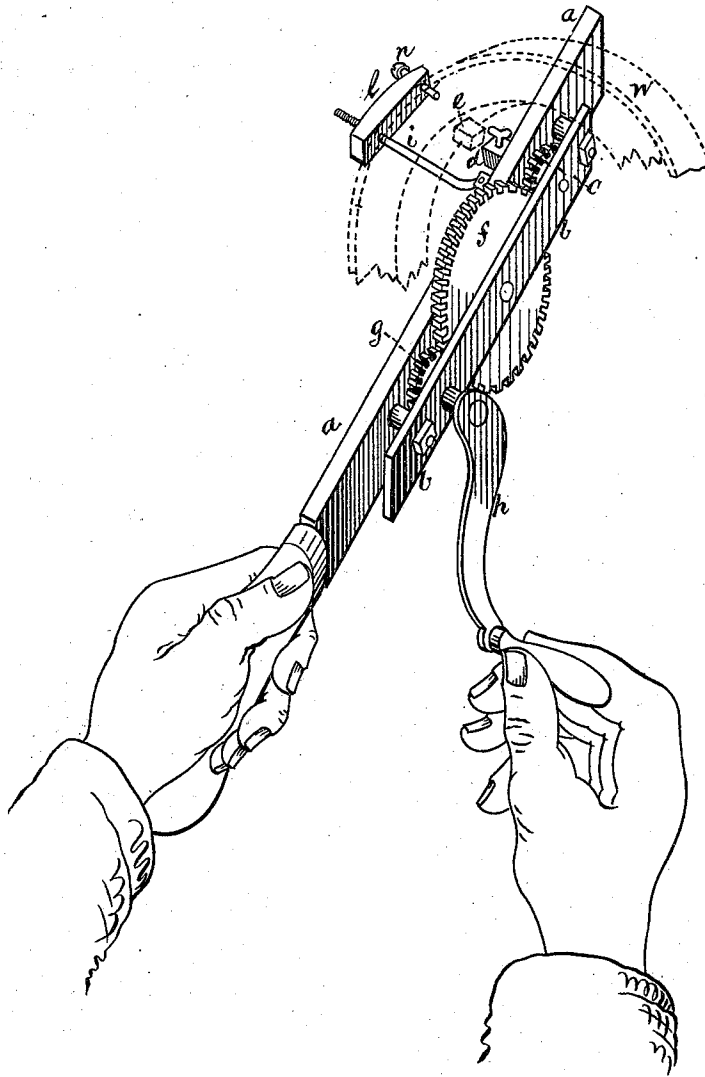


W. HILL.

WRENCH.

No. 173,467.

Patented Feb. 15, 1876.



Witnesses;
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Att'y

UNITED STATES PATENT OFFICE.

WALTER HILL, OF SOUTH EASTON, MASSACHUSETTS.

IMPROVEMENT IN WRENCHES.

Specification forming part of Letters Patent No. **173,467**, dated February 15, 1876; application filed November 18, 1875.

To all whom it may concern:

Be it known that I, WALTER HILL, of South Easton, in the county of Bristol and State of Massachusetts, have invented an Improved Gear-Wrench, of which the following is a specification:

The object of my invention is to produce an instrument for readily removing the nuts from bolts by which the tires are secured to the fellys of a carriage or wagon wheel.

The usual method of removing the nuts is by means of an ordinary wrench; but as the nuts are somewhat inaccessible, the fellys being curved, and the spokes being liable to interfere with the free movement of the wrench, it is necessary to make a frequent change in the position of the wrench while taking off the nut, thus rendering the process slow and tedious.

By means of my invention the nut is removed much more easily and rapidly, thus effecting a great saving of time and labor in the operation of removing the tire and replacing it.

My invention consists of a nut holder or head having a square opening, made to fit the nut to be operated upon, the said head or holder to be secured on the end of a projecting arbor of a pinion-wheel, journaled in a frame composed of two parallel flat bars of metal, in which frame are also journaled a cog-wheel and another pinion, the three gearing together, and receiving motion from a crank secured to the other pinion. The nut holder or head is held in position on the nut by means of an adjustable brace on an arm, which is pivoted or hung to the frame, the said brace being provided with a screw-bolt or a hook, which bears against the tire and side of the felly, to keep the brace in position.

The accompanying drawing represents a perspective view of an instrument embodying my invention.

a a represent a metal bar provided with a handle, by which the instrument is held when in use. To the bar *a a* is bolted at each end a shorter bar, *b b*, a space being left between the two bars for the accommodation of a cog-wheel, *f*, and two pinions, *c* and *g*, all gearing together. To the outer portion of the arbor

of the pinion *c*, which projects from the frame *a*, is attached, so as to move with the arbor, a nut holder or head, *d*. This nut-holder is provided with a square cavity in its outer end made to fit the nut *e*, which latter fits on the inner end of the tire-bolt projecting through the felly.

The head of the nut may be secured within the holder *d* by means of a thumb-screw, if desirable.

The holder *d* may be made detachable, so as to adapt holders to nuts of different sizes when required.

To the outer side of the bar *a* of the frame, and near the nut-holder *d*, is hung or pivoted a metal arm or bar, *i*, having a screw-thread on its outer end, and on the screw portion of the swinging arm *i* is fitted a brace, *l*, provided on its free end with a bolt, *n*, which is made adjustable. The bolt *n* is designed to pass over the tire, and hold the brace firmly in place opposite the nut-holder *d* while the nut is being turned.

Instead of the swinging arm, a rigid brace having a curved or hooked end may be attached to the side piece *a*, so as to be removable, by which means braces of different sizes may be adjusted to wheels of various sizes.

Motion is imparted to the nut-holder by means of a crank, *h*, attached to the shaft of pinion *g*. By applying the power to pinion *g* it will be seen that the crank *h* can be readily turned without interfering with the felly, or any part of the wheel, and the motion being continuous, no change in the position of the instrument being necessary, the nut is rapidly and easily unscrewed from the bolt, and thus a great saving of time and labor is effected.

w represents a portion of the felly and tire of a wheel from which the nut *e* is to be removed.

In operation, the wheel from which the tire is to be removed is placed in a horizontal position upon a suitable support. The instrument being then held in a perpendicular position, the head or nut-holder *d* is fitted to the head of the nut to be removed. The brace *l n* is then fitted to bear against the tire and felly, so as to give it a steady hold. Motion being then imparted to the gear-wheels, the nut is

speedily removed from the bolt, and the operation repeated until all the bolts are removed.

What I claim as my invention is—

The combination of the nut-holder *d*, operated by means of the gearing *f c g* and crank *h*, with the adjustable brace and bolt *i l n*, substantially as and for the purpose set forth.

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

WALTER HILL.

Witnesses:

JOHN O. DEAN,
J. H. ADAMS.