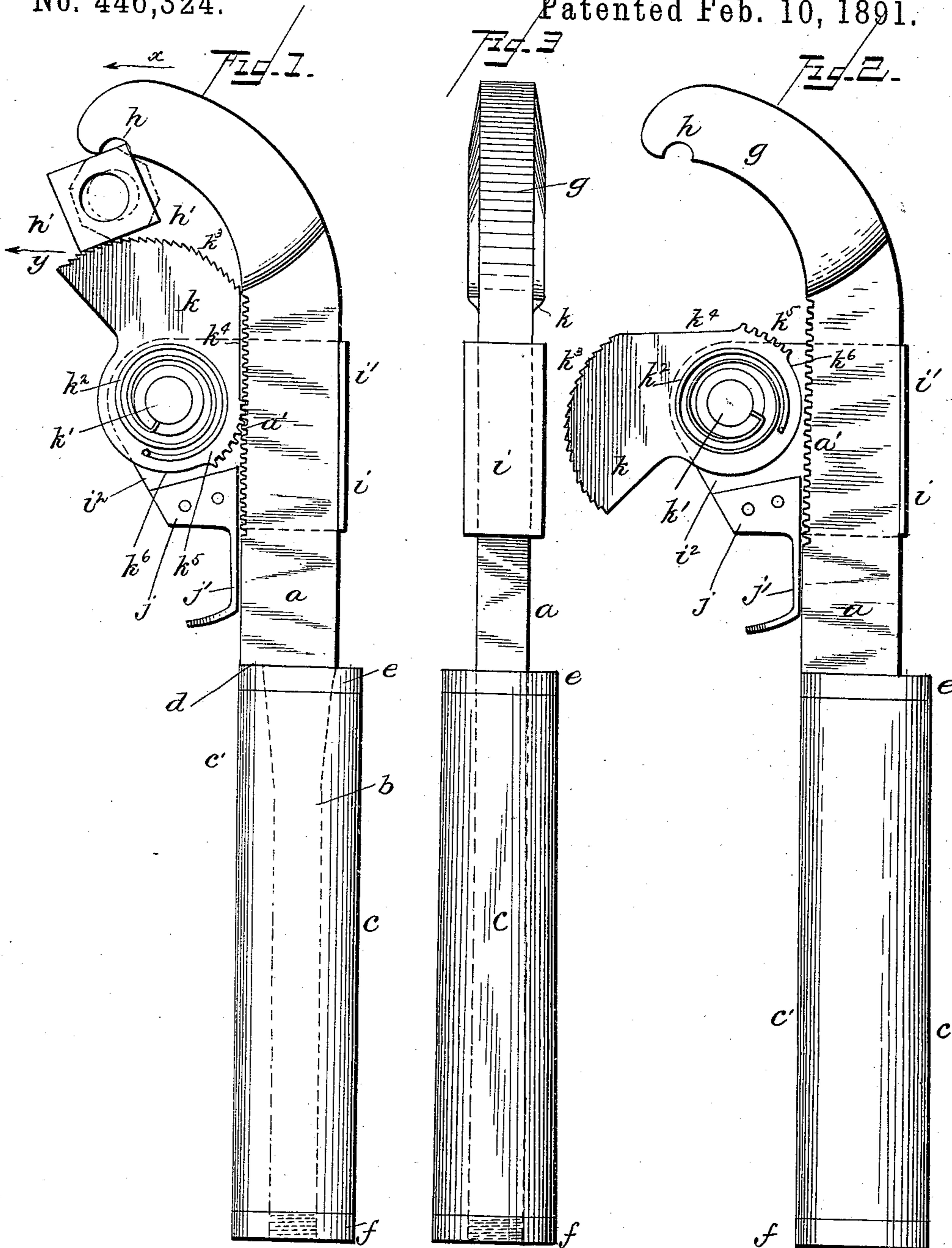


(No Model.)

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COMBINED NUT AND PIPE WRENCH.

No. 446,324.

Patented Feb. 10, 1891.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

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## COMBINED NUT AND PIPE WRENCH.

SPECIFICATION forming part of Letters Patent No. 446,324, dated February 10, 1891.

Application filed October 7, 1890. Serial No. 367,359. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL H. CARPENTER, a citizen of the United States, residing at Orlando, in the county of Orange and State of Florida, have invented a certain new and useful Improvement in Combined Nut and Pipe Wrenches, of which the following is a full, clear, and exact description.

The object of this invention is to provide a wrench equally applicable upon nuts and pipes, and which is capable of being moved to get a fresh hold upon the object being acted upon without removing the wrench from such object.

The invention consists, broadly, in a wrench having one jaw, and preferably its fixed upper jaw, constructed with a transverse notch or groove having salient edges to bite and engage a surface of an object to be turned, combined with a lower jaw, which may be either fixed or movable, and is eccentric relatively to the other jaw to engage an opposed surface of the object to be turned.

The invention also consists of a wrench having a fixed jaw provided with a transverse groove or notch, combined with a yielding or adjustable eccentric in the lower jaw.

The invention also consists of a wrench having a fixed jaw and also a movable jaw, which latter is constructed as a spring-cam having a mutilated pinion which co-operates with a rack on the wrench-bar.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation showing one form of my invention with the parts in position in engagement with a nut. Fig. 2 is a similar view showing the parts in position to effect an adjustment of the movable jaw, and Fig. 3 is a rear view.

In the form of wrench selected to illustrate my invention and shown in the drawings, the bar *a* is by preference of bar-steel, and one end is made with a shank *b* to receive a wooden or other handle *c*, the said bar being provided with a shoulder *d*, which rests upon or in a step *e* on top of the handle, and the end of the shank being screw-threaded to receive a nut *f* to bind it and the handle together. The front *c'* of the handle is flush with the edge of the bar for a purpose presently ap-

pearing; but I do not limit my invention to any construction of handle or manner of providing the wrench with a handle. The bar terminates at its other end in a hook or jaw *g* of substantially the curvature shown, and in this jaw and near the outer end thereof is made the transverse notch or groove *h*, which is a main feature of this invention.

While I do not limit my invention to any form, size, number, or proportions of the notches or grooves, still I prefer a semicircular groove of considerable depth and sufficient to receive within itself the angle or corner of a nut and have its salient edges *h'* and *h''* bite the sides of the nut at a considerable distance from the angle or corner, so as not to wear off the corners or angles. I have shown a square nut in full lines and a hexagonal nut in broken lines in position in Fig. 1 to illustrate the manner of the engagement of the notched or grooved jaw therewith, and it will be observed that the nut is not engaged by its angles or corners, but, on the contrary, that the wrench takes hold of the sides of the nut.

The rest for the nut may be a fixed jaw or a movable jaw, and as both are old I have shown a movable jaw, forming a feature of the invention herein described. This movable jaw comprises a yoke *i*, which embraces the bar *a*, so as to be capable of longitudinal movement thereof, and having a rear wall *i'* and two parallel side walls *i''*, which respectively embrace the rear edge and sides of the bar and project forward of the front edge of the said bar. The side walls *i''* are united by a block *j*, riveted or otherwise secured to and between them, and having a depending hook or finger-hold *j'*, by which the yoke and its appurtenances may be moved.

*k* is a cam or eccentric secured in the yoke between its side walls by a pivot or shaft *k'*, and normally held up against and stopped by the bar by means of a volute or coiled spring *k''*, set or sunk in a recess in the side of the cam and secured by one end to the cam and by its other end to a fixed part of the yoke. This spring is concealed and protected by the side wall of the yoke. The upper and cam surface proper *k'''* of the cam is toothed or roughened. The rear edge *k''''* of said cam is made straight, and its lower end is made as

or provided with a mutilated pinion  $k^5$  to engage the toothed rack  $a'$  on the front edge of the bar  $a$  to hold the movable jaw in adjusted position. When the cam is turned out by rotation on its pivot until the plain portion  $k^6$  of its mutilated pinion comes opposite the toothed rack, the movable jaw may be adjusted lengthwise of the bar either by pull or push on the finger-hold  $j'$  or by grasping the yoke, so as to vary the distance between the jaws to adapt the wrench to the size of the object to be acted upon, and when such adjustment is secured by releasing the hold on the cam its spring will return its pinion's teeth to engagement with the toothed rack and put the wrench in condition to act upon the said object. The finger-hold  $j'$  plays up and down against the bar  $a$  and handle, the front of the handle being made flush with the bar at  $c'$ , as before stated, for this purpose, and hence the yoke may be made to fit the bar quite snugly and no interposed spring is needed. It will be observed of this movable jaw that its cam has a double or compound movement, which may be illustrated best by the following description of the operation.

Instead of grasping parallel sides of the nut, my wrench is designed to engage the nut obliquely, as shown in Fig. 1; but it is necessary only that the notch  $h$  shall engage or take hold of the sides of a corner, for the cam will bite an opposed side sufficiently to grasp the nut tight and hard enough to effect the turning of the nut. The nut is turned on or off by moving the wrench in the direction of the arrow  $x$ , Fig. 1. The thrust on the cam will be toward the bar, and the teeth of its pinion thereby will be held hard and fast in engagement with the toothed rack on the bar. As a fresh hold on the nut is desired, the wrench is rotated in the reverse direction, when the spring  $k^2$  permits the cam to yield or rotate in the direction of arrow  $y$ , the nut at the same time, by the stress of its hold on its bolt, slipping on the cam; but as the cam rotates in the direction of arrow  $y$  its pinion  $k^5$  will ride up the rack  $a'$ , and in doing so the eccentricity of the cam will be compensated for and so a fast hold on the nut will be retained. Then as the fresh hold on the nut is gained and the wrench again moved in the direction of arrow  $x$  the cam will be returned toward the bar  $a$ , both by stress of such movement and also by the action of its spring, and the jaw, through the action of the pinion, will be returned to proper position. The contact of the flat face  $k^4$  of the cam with the front edge of the bar arrests and limits the movement of the cam toward the bar, and so, also, assists the engaged teeth of the pinion and rack in holding the cam in position.

When the cam is rotated on its pivot in the direction of arrow  $y$  until the plain part  $k^6$  of its mutilated pinion comes opposite the toothed rack on the bar  $a$ , the movable jaw

may be slid freely along the bar to secure any desired proximity of the two jaws. This movement of the jaw may be effected by engaging the finger-hold  $j'$  or the yoke. The spring will return the cam and its pinion into re-engagement with the bar. The finger-hold is a convenient device for releasing the wrench from engagement with a nut.

In using my wrench on round objects, such as pipes, it is preferable to throw out the cam in the direction of arrow  $y$ , so as to allow the stress of the spring to act upon the cam in insuring a grip of the object; otherwise no alteration of the construction of the wrench is necessary.

I do not limit my invention in the movable jaw to the combination of such movable jaw with a fixed jaw having the transverse groove or notch, as obviously it may be applied to wrenches having other forms of fixed jaw; and I do not limit the invention in movable jaws to a cam having a spring to return it, since the spring may be omitted and the cam returned by hand until its pinion engages the toothed rack.

Some of the many advantages of my wrench are its quick and secure engagement with the object to be acted upon, and too much importance cannot be given the value of the notch or groove  $h$  in this connection, the absence of adjusting screws and springs, the compactness of parts, low cost of production, and extreme durability.

What I claim is—

1. A wrench having a jaw provided with a transverse notch or groove having a salient edge to bite and engage the surface of an object to be moved, combined with an opposing rest which is eccentric relatively to the jaw and between which and the said jaw the object is grasped, substantially as described.

2. A wrench having a jaw provided with a transverse notch or groove of sufficient size and depth to receive within itself an angle or corner of an object to be moved and having its salient edges in engagement with the sides of such angle or corner at a considerable distance from it, combined with a rest for an opposed side of such object, substantially as described.

3. A wrench having a fixed jaw provided with a transverse notch or groove, combined with an adjustable eccentric in an opposing jaw or rest, substantially as described.

4. A wrench having a fixed jaw provided with a transverse notch or groove, combined with an opposing movable jaw comprising a cam having a mutilated pinion which engages a toothed rack on the bar of the fixed jaw, substantially as described.

5. A wrench having a fixed jaw provided with a toothed rack, combined with a movable jaw constructed with a cam which has a mutilated pinion to engage said toothed rack, substantially as described.

6. In a wrench, a movable jaw having a cam, a spring to return it to operative position, a

mutilated pinion, and a yoke supporting the cam and its appurtenances, combined with a toothed rack on the wrench-bar, substantially as described.

- 5 7. In a wrench, a jaw freely fitted to the wrench-bar and having movement lengthwise of the wrench-bar, and provided with a gripping-surface, such as a cam, moving with the jaw, and also having an independent move-  
10 ment, by means of which it may be engaged

with and disengaged from the object being acted upon and at the same time move the jaw bodily toward and from the said object, substantially as described.

In testimony whereof I have hereunto set 15 my hand this 1st day of October, A. D. 1890.

DANIEL H. CARPENTER.

Witnesses:

WM. H. FINCKEL,

E. A. FINCKEL.