(No Model.) 2 Sheets—Sheet 1.

T. F. WELLS.

POWER WRENCH.

No. 418,098. Patented Dec. 24, 1889.

FIG. 1.

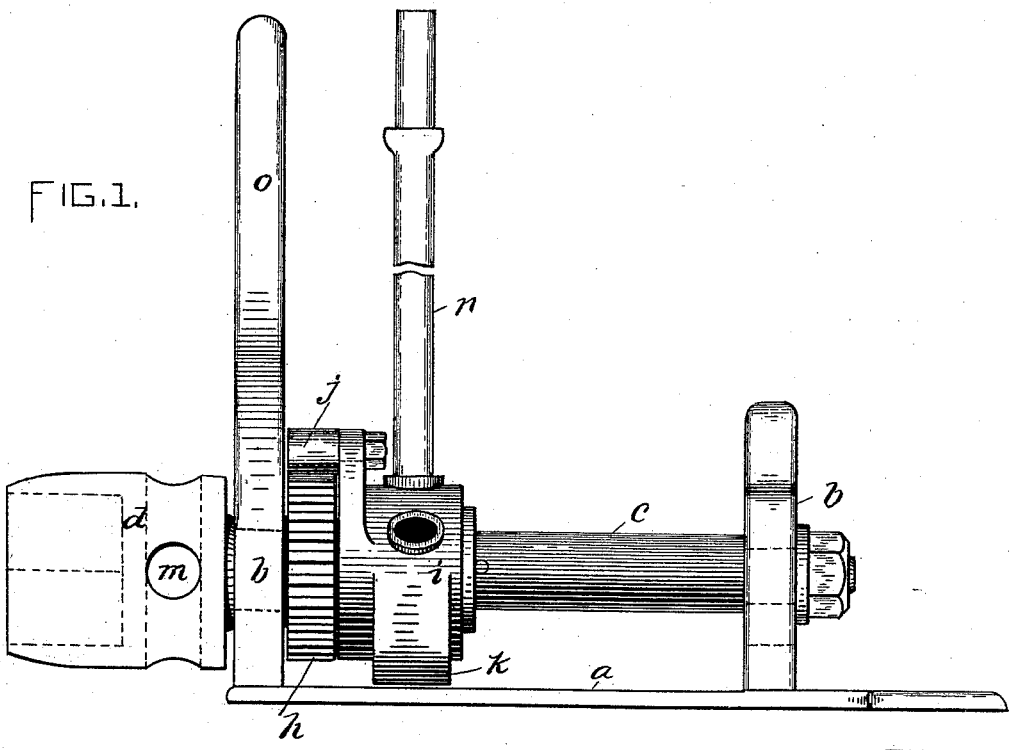
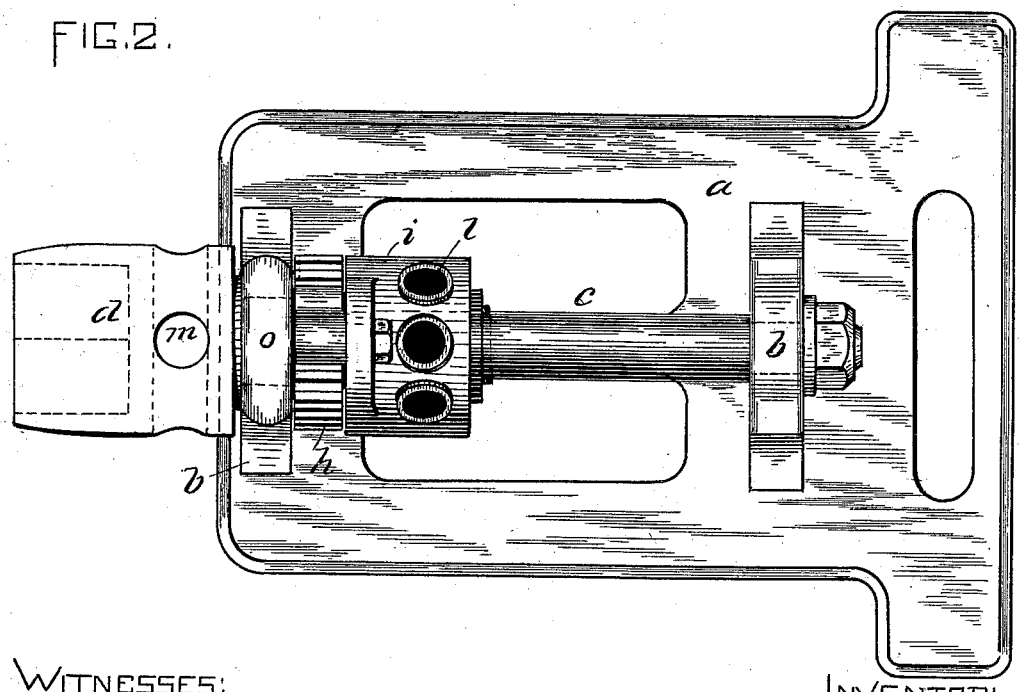


FIG. 2.



WITNESSES:
H. Brown.
A. D. Harrison

INVENTOR:
T. F. Wells.
by Wm. H. Brown & Crossley
" attys.

(No Model.) 2 Sheets—Sheet 2.

T. F. WELLS.

POWER WRENCH.

No. 418,098. Patented Dec. 24, 1889.

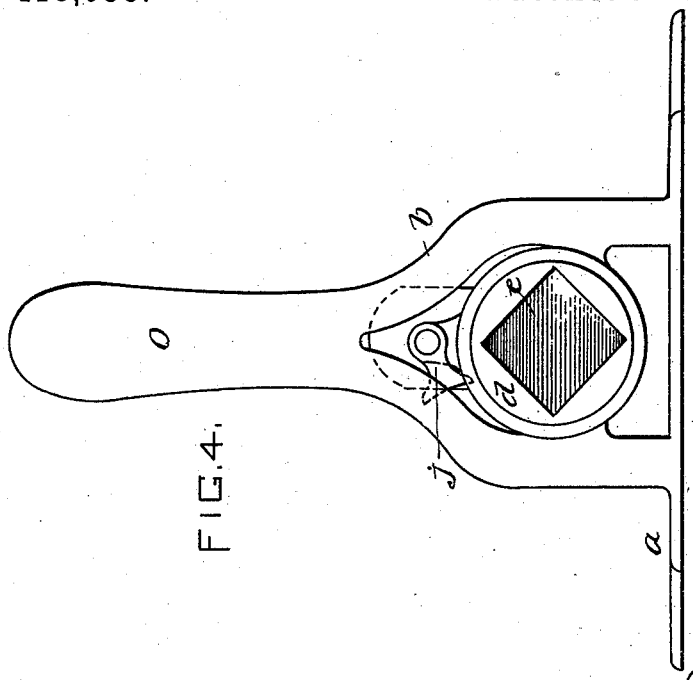


FIG. 4.

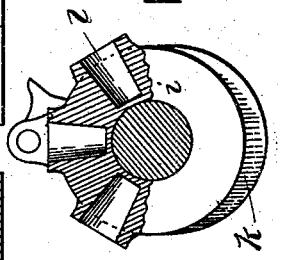


FIG. 6.

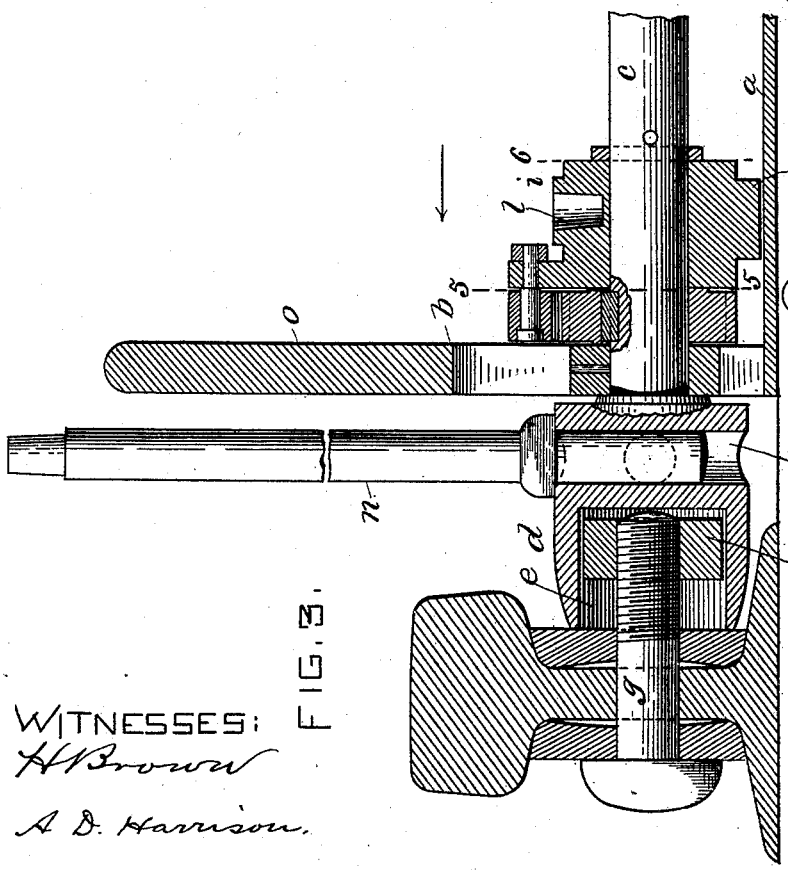


FIG. 3.

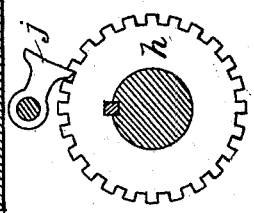


FIG. 5.

WITNESSES:
H. H. Brown
A. D. Harrison.

INVENTOR:
T. F. Wells.
by Wright, Brown & Crosby
his attys.

UNITED STATES PATENT OFFICE.

THOMAS F. WELLS, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO THE MECHANICAL MANUFACTURING COMPANY, OF NASHUA, NEW HAMPSHIRE.

POWER-WRENCH.

SPECIFICATION forming part of Letters Patent No. 418,098, dated December 24, 1889.

Application filed July 1, 1889. Serial No. 316,141. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. WELLS, of Winchester, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Power-Wrenches, of which the following is a specification.

My invention has relation to "power-wrenches," so called, and particularly to wrenches designed for turning the nuts of fish-plate bolts and other nuts and bolts requiring great power to "start" them or to make them tight.

It is the object of my invention to provide a power-wrench for the purposes mentioned which shall be comparatively light in weight and small in bulk, so that it may be readily transported from point to point or place to place, and at the same time possess maximum strength and efficiency.

As is well known by those skilled in the art, the force required to make nuts wrench-tight on the bolts of fish-plates and to start them out after they have once become rusted on to any considerable extent is very great, and oftentimes more than can be exerted by one man with an ordinary device, and in order to render a machine capable of withstanding the strain that is put upon it it must be made very strong. As these machines when in use must be moved about frequently from place to place, it is desirable that they should be as light in weight and small in bulk as may be, and that they may not get out of order easily or be readily broken it is necessary that their structure should be as simple as possible.

In contriving my invention the foregoing and other necessities, discovered by experience, were kept in mind, and the difficulties and objections noted have been avoided or overcome by my improvements, which consist of a construction, as hereinafter described and claimed, whereby the power applied to the machine is exerted directly upon the wrench and as near the nut as possible in making a nut wrench-tight or starting it out on a bolt, and in the work running a nut on or off a bolt the strain is likewise brought near the wrench, so that only the latter and its adjacent part or parts need be made of great strength or weight. At the same time the power expended is more effectively employed when applied directly upon the wrench than when received from a remote point of such machine as it is practical to employ.

Reference is to be had to the annexed drawings and to the letters of reference marked thereon, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is a side elevation of my improved power-wrench. Fig. 2 is a top plan view of the same. Fig. 3 is a longitudinal vertical section of a part of the same and of a railway-rail, fish-plates, bolts, and nut, showing the manner of using the device. Fig. 4 is a front end view. Fig. 5 is a sectional diagram taken on the line 5 5, Fig. 3, looking in the direction of the arrow. Fig. 6 is also a sectional diagram taken on the line 6 6, Fig. 3, and also looking in the direction of the arrow.

In the drawings, *a* designates the bed or base plate, which should be of sufficient strength and breadth to support the parts of the machine and afford a support for the operator's feet, when necessary, as hereinafter explained.

b are upright standards supported on the bed, in which standards is suitably journaled the wrench-shaft *c*, provided on its forward end with a strong wrench *d*, having a socket *e* of suitable size and form to receive the nuts *f* on the fish-plate bolts *g*.

h is a ratchet-wheel keyed upon or otherwise affixed to the wrench-shaft *c*, as near the wrench *d* as may be convenient, desirably next to the forward standard *b* on the side opposite that upon which the wrench operates, as shown.

i is a strong collar adapted to turn loosely on the shaft, to an appropriate part of which collar is pivoted a reversible pawl *j*, arranged to engage the teeth of the ratchet-wheel *h*. The collar *i* may be weighted at its lower side, as at *k*, to normally keep the side to which the pawl is pivoted upward, and this

upper side of the collar is provided with radial sockets *l*.

The wrench *d* is provided with radial sockets *m*.

n designates a lever adapted to be inserted in the socket of the wrench *d* or collar *i*. I find it convenient to construct one end of this lever so that it will fit the sockets *m*, and adapt the other to the sockets *l*.

In the use of my improved machine, supposing a nut is to be screwed upon a fish-plate bolt, the device is placed upon the ground or sills or ties, and so as that the wrench-socket may engage the nut, which may have been started on the bolt by hand. The lever *n* is now placed in one of the sockets *l* of the collar *i*, and the pawl *j* being properly adjusted, the operator by merely oscillating the lever may turn the nut home. In order to make the nut tight, or as tight as is desirable or essential on work of this kind, great force is necessary, and a force, too, greater than the means used to run on or turn up the nut, or than the torsional strain of the wrench-shaft will withstand, and to meet the exegencies of the case and effect the mentioned necessary end the operator may remove the lever *n* from the collar *i* and insert it in the radial sockets *m* of the wrench *d*, when one or more persons taking hold of said lever may turn up the nut with powerful force, as will be understood without further description.

In taking off nuts from the bolts of fish-plates the same operation will be performed as in turning them on, excepting that the wrench-shaft and wrench will be operated in the reverse direction, the adjustability of pawl *j* being provided for this dual work.

One of the standards *b*, preferably the forward, may be made longer than the other, or be extended, as at *o*, so as to afford a handle or means for steadying the machine while being operated by the lever *n*, particularly when the same is inserted in the collar *i*. In practice I have employed other means than that shown and described for quickly turning the nut on or off the bolt; but that shown has been found efficient for the purpose. By my improved machine it will be seen that but few parts are necessary in its construction, and the strain in its operation being brought as near as may be to the nut being operated upon only these parts need be of great weight or bulk.

The means whereby I am enabled to apply force or leverage directly upon the wrench in making the nut-wrench tight is particularly important, since I am thereby enabled to fully utilize the power or force exerted, avoid any torsional strain on the wrench-shaft as well as undue strain on other parts of the machine not capable of withstanding the same.

I do not herein broadly claim the mechanism shown and described for securing a rapid movement of a nut and increased power to start or tighten such a nut, since the same forms part of a pending application for patent, Serial No. 332,066, filed November 29, 1889. This mechanism includes the socketed wrench-head, the wrench-shaft having a ratchet-wheel, and a collar provided with sockets having connection with said ratchet-wheel.

Having thus explained the nature of my invention and described a way of constructing and using the same, I declare that what I claim is—

1. The combination, with the wrench, wrench-shaft and its support, of a ratchet-wheel fast on the shaft, a collar provided with radial sockets and weighted in its lower part, as at *k*, loose on the shaft, a reversible pawl pivoted upon said collar and adapted to engage said ratchet-wheel, and a lever insertible in the sockets of said weighted collar to operate the latter, as set forth.

2. The herein-described improved wrench, comprising the combination, with the bed or base, of the wrench having a series of radial sockets, a wrench-shaft having its supports connected with said bed, the ratchet-wheel fast on said shaft, a collar loose on the shaft and weighted in its lower part and provided with a series of sockets, a reversible pawl pivoted upon said collar and adapted to engage said ratchet with said collar, and the lever insertible in the sockets of said wrench and weighted collar, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 28th day of June, A. D. 1889.

THOMAS F. WELLS.

Witnesses:
ARTHUR W. CROSSLEY,
C. F. BROWN.