W. W. Hubbard.

Screw-Cutter.

No. 44,954. Patented Nov. 8, 1864.

Fig. 1.

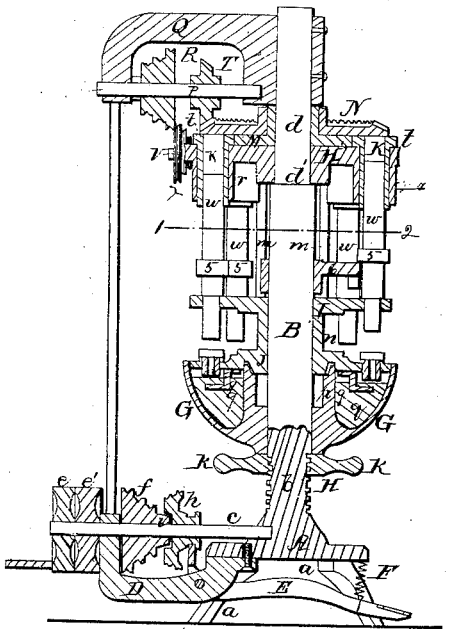


Fig. 2.

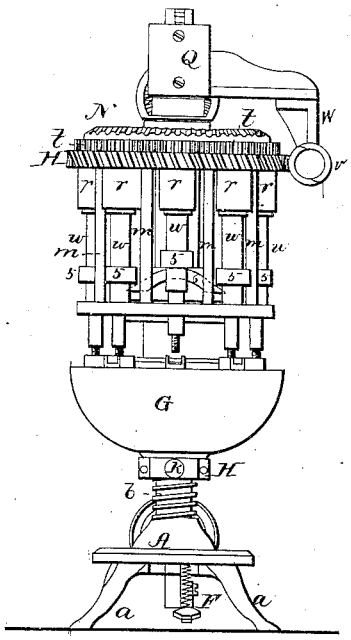


Fig. 3.

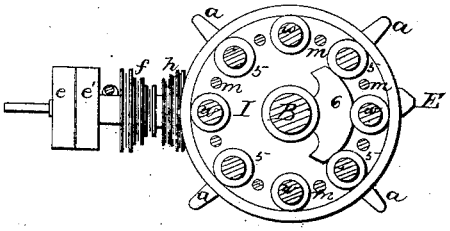
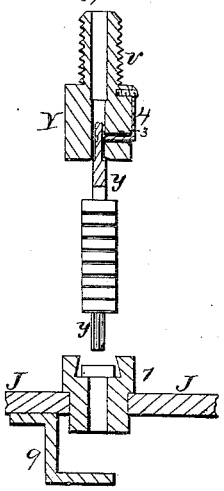


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM W. HUBBARD, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVED MACHINE FOR CUTTING THREADS IN NUTS.

Specification forming part of Letters Patent No. **44,954**, dated November 8, 1864.

To all whom it may concern:

Be it known that I, WILLIAM W. HUBBARD, of Philadelphia, Pennsylvania, have invented an Improved Nut-Screwing Machine; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of certain mechanism, fully described hereinafter, for rapidly cutting screw-threads in the nuts of bolts.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings which form a part of this specification, Figure 1 is a vertical section of my improved nut-screwing machine. Fig. 2 a front view. Fig. 3 a sectional plan on the line 1; 2, Fig. 1 and Fig. 4 a view, partly in section, of a detached portion of the machine drawn to an enlarged scale.

Similar letters refer to similar parts throughout the several views.

A is the base of the machine, resting on suitable legs, *a*, and from this base projects the cylindrical column B, a portion of which at *b* has screw-threads cut on it, the remaining portion being plain, and the upper end being reduced in diameter at *d*, where a collar *d'* is formed.

C is a shaft, turning at one end in the base A, and near the opposite end in a bracket, D, which is secured to the under side of the said base. This shaft is furnished with the fast and loose pulleys *e* and *e'*, a cone-pulley, *f*, and another cone-pulley, *h*, the pulley *f* being fast on the shaft, and having a conical hub or projection, *i*, adapted to a conical recess in the pulley *h*, the latter being loose on the shaft and being under the control of a lever or treadle, E, which is hung to a pin on the bracket D, and the long arm of which is connected to the base A by a coiled spring, F, which, tending to raise the long arm of the treadle E, causes the short arm to maintain the pulley *h* in such intimate contact with the pulley *f* that both must revolve together.

G is a hemispherical cup or reservoir, fitted snugly, but so as to slide freely, on the plain portion of the column B, the reservoir resting on a collar, H, which has internal screw-threads adapted to the threads *b*, and which has suitable handles, *k*, by means of which the collar can be turned, and, acting as a nut, serve to raise or lower the reservoir.

H' is a circular plate, the central hub of which fits the reduced portion of the column and rests on the collar *d'*, and this plate H is connected to a lower plate, I, by a series of vertical rods, *m*, arranged in a circle concentric with the column, and best observed on reference to the plan view, Fig. 3.

Another plate, J, fits loosely on the central column, and this plate is connected to the plate I by the tube *n*.

The circular plates H', H, and J are thus permanently connected to each other, and are arranged to revolve together on the central column, B, the weight of the plate and the appliances connected therewith being supported by the collar *d'*.

It will be seen on reference to Fig. 1 that there is a tubular projection, *p*, in the interior of the reservoir G, and that the upper edge of this tube projects into an annular space formed on the under side of the plate J. A receptacle, *q*, is thus formed to receive a supply of oil or other suitable fluid necessary in operating with the machine.

On the under side of the plate H are a series of hollow projections, *r*, arranged in a circle concentric with the column, and into each projection a sleeve, K, fits snugly, but so as to revolve freely, the upper end of each sleeve terminating in a pinion, *t*, which gears into the central cog-wheel, M, the latter being secured to a bevel-wheel, N, so that both may revolve together and independently of the plate H'.

A shaft, P, is arranged to turn in a bracket, Q, secured to the upper end of the column, this shaft being provided with a cone-pulley, R, similar to and driven from the pulley *f* on the shaft C. The shaft P has also a bevel-pinion, T, arranged to gear into the wheel N.

On the edge of the circular plate H' are formed inclined teeth, adapted to the threads of a worm, U, on the shaft V, which is arranged to turn in a bracket, W, secured to the bracket Q—this shaft being furnished with a cone-pulley, *x*, similar to and driven from the pulley *h*.

In each of the sleeves K the upper end of a spindle, *w*, is arranged to fit snugly, a key being secured to the sleeve and fitting into a groove in the spindle, so that while the latter can move freely in a vertical direction it cannot turn independently of the sleeve.

The lower portion of each spindle passes through and turns in the plate I, below which it is furnished with the screw-tap *y*, which is attached to the spindle in the manner best observed on reference to the enlarged view, Fig. 4, in which Y represents a chuck, the stem V of which is arranged to be screwed into one of the spindles *w*. A square opening is made in the lower end of this chuck for the reception of the square upper end of the screwing-tap *y*, the end of the tap which enters the chuck having a notch on each of the four sides, so that a pin, 3, acted on by a spring, 4, can penetrate any one of the said notches, and thus retain the screwing-tap in its place. It should be understood that the end of this pin is so rounded and the notches so formed that the tap can be readily withdrawn by a slight effort.

Threads are formed on the screwing-tap *y* on the lower portion only of the same, the tap throughout the greater portion of its length being plain and less in diameter than the screwing portion.

Each spindle is provided with a collar, 5, which is arranged to come in contact with and slide over the inclined surface of a stationary cam, 6, which is secured to the central column, this cam being of such a length and so formed as to raise each spindle in succession and maintain it in an elevated position for a short time during the operation of the machine.

Directly beneath each spindle and in the plate J is secured a chuck, 7, Fig. 4, in which a dovetailed recess is formed for the reception of one of the nuts to be screwed, this recess being of sufficient width at the top to permit the nut to pass vertically in and out of the recess.

A bent plate, 9, is secured to the under side of the plate J, adjacent to the chuck 7, for the purpose of preventing the taps from falling from the spindles and through the chucks 7 into the reservoir *q*.

The operator is seated on a stool placed directly in front of the machine, so that the treadle E is accessible to one of his feet, and near him is a tray or other suitable receptacle containing the nuts to be screwed.

As the machine turns, the spindle directly in front of the operator is elevated to its highest position by the cam 6, the end of the tap being above the chuck in the plate J, so that the operator can slide one of the nuts horizontally into the above-described dovetailed recess of the chuck. As the machine continues to turn, the spindle, which had been elevated, gradually moves away from and becomes free from the control of the stationary cam 6, and consequently the spindle falls and the tap enters the opening of the nut. In the mean time, as the machine continues to revolve, another chuck presents itself for the reception of another nut, and this is continued as the machine turns.

The screwed portion of every tap passes through each nut and into the oil in the reservoir, so that it is in a proper lubricated condition to act on another nut.

The plain portion of each top gradually becomes loaded with screwed nuts, as seen in Fig. 4, and when it will hold no more the attendant withdraws the tap from the chuck 4, and after stripping off the nuts replaces the tap in the chuck.

As the tap enters the nut in the first instance it has a tendency to turn it round and pull it out of the recess, but this is prevented by the dovetailed form of the said recess, for as the nut turns its corners become jammed in the inclined sides, and is rendered incapable of either turning round in the recess or being withdrawn therefrom.

The depth to which the tap is caused to penetrate the lubricating-fluid in the reservoir G is regulated by the altitude of the same, and this can be adjusted at pleasure by the nut H.

When the machine is in full operation each spindle turns on its own axis, and at the same time the whole of the spindles turn together round the central column B, but it may be necessary to retard the last movement while the former continues. In order to do this, the operator presses the treadle E and throws the wheel *h* out of gear with the wheel *f*, so that the further rotation of the spindles round the central column is arrested, to be renewed, however, the moment the operator removes his foot from the treadle.

It will now be seen without further description that the operation of screwing the nuts is continuous and that it is accomplished with the greatest rapidity.

I claim as my invention and desire to secure by Letters Patent—

1. A series of taps, arranged in a circle, and caused to revolve round the center of the same and round their own axis.

2. The plate J, with its chucks 7 and the dovetailed recess in the same, in combination with the said revolving taps.

3. The combination of the spindles and their taps with the adjustable reservoir G.

4. The plate 9, arranged beneath the plate J, substantially as and for the purpose set forth.

5. The plate H′, with its inclined teeth, tubular projections *r*, and spindles *w*, in combination with the worm U.

6. The pinion T on the shaft P, the bevel-wheel N, and cog-wheel M, and sleeves K, with their pinions *t*, the whole being arranged and operating substantially as set forth.

7. The shaft C, with its wheels *f* and *h*, adapted to each other, as set forth, in combination with the spring-treadle E.

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

WILLIAM W. HUBBARD.

Witnesses:

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EDWARD WINSLOW.