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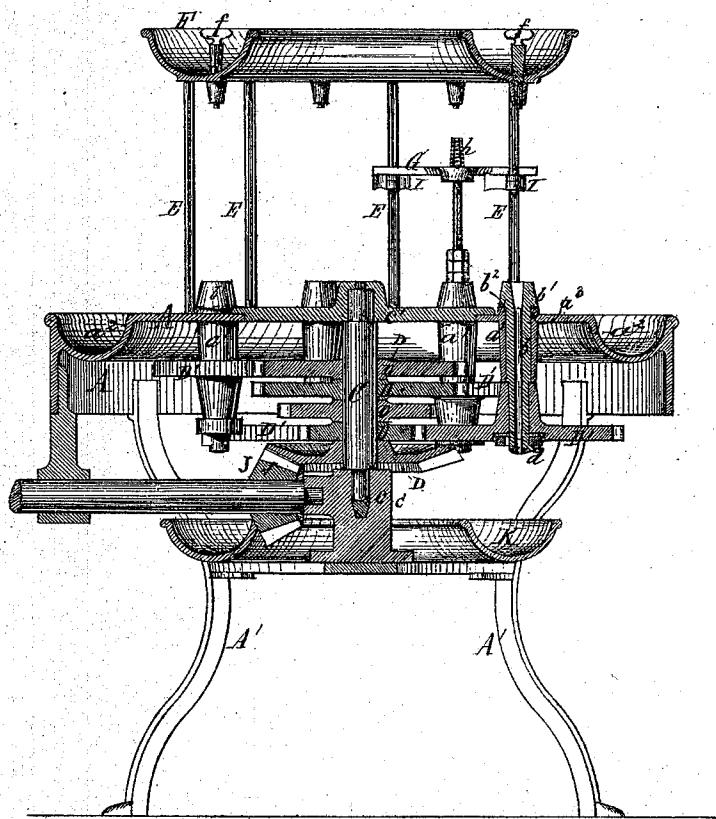
JOHN N. DURRELL,

## Improvement in Machines for Tapping Nuts.

No. 115,451.

Patented May 30, 1871.

Fig. I



Dr. J. Bonner.  
Victor H. Becker. menieres.

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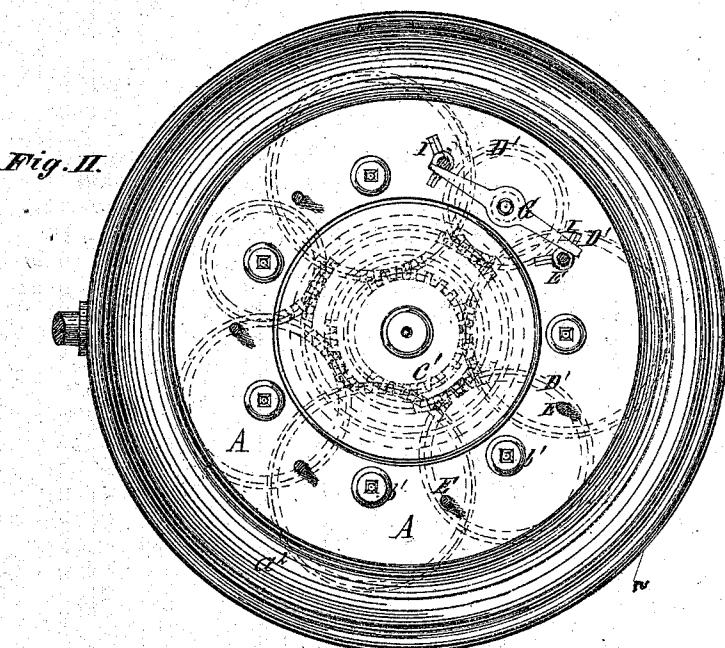
JOHN N. DURRELL.

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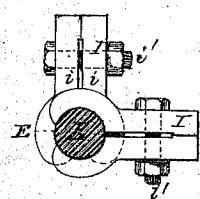
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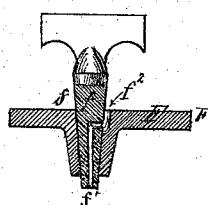
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*Fig. III.*



*Fig. IV.*



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## UNITED STATES PATENT OFFICE.

JOHN N. DURRELL, OF DUNKIRK, NEW YORK.

## IMPROVEMENT IN MACHINES FOR TAPPING NUTS.

Specification forming part of Letters Patent No. 115,451, dated May 30, 1871.

I, JOHN N. DURRELL, of Dunkirk, in the county of Chautauqua and State of New York, have invented certain Improvements in Nut-Tapping Machines, of which the following is a specification:

My invention relates to the mechanism for tapping nuts, in which a series of taps and tap-holders is so arranged that the taps enter the nuts vertically from below, and in which the lubricating material contained in a reservoir above the nuts and taps is made to fall directly into the orifice of the nuts and upon the extremity of the tap; and it consists in certain arrangements and constructions hereinafter specified.

In the accompanying drawing forming part of this specification, Figure I is a sectional elevation of a machine embodying my said improvements; Fig. II is a sectional plan of same; Fig. III is a detail view of nut-holder stops; and Fig. IV is a detail view of drip-plug.

Like letters refer to like parts in each of the figures.

A is a circular table, supported on suitable legs A', and forming the main frame of the machine. It is cast with a trough, a<sup>2</sup>, near its outer edge, and with a number of circularly-arranged bosses, a<sup>1</sup>, which project below the face of the table, as shown, and form the bearings for the tap-spindles b, which pass vertically through them. These spindles are hollow, and are provided at their upper ends, which project above the table, with an enlargement, b<sup>1</sup>, constructed on its under side with an annular groove, b<sup>2</sup>, in which fits the upper projecting end a<sup>3</sup> of the bearing a<sup>1</sup>. This construction prevents chips and dust which fall on the table from working between the spindles and their bearings. C is the central main driving-shaft, supported at its lower end in a step, c, which rests on a cross-tree between the legs A', and having its upper bearing formed in a plate, c', which is bolted over a central opening in the table A. D D' are four gear-wheels, of different sizes, rigidly keyed to the shaft C, being let down through the opening in the main table. D' D' are the changeable gear for the tap-spindles, of sizes to correspond with those on the main shaft. They are secured on the spindle by nuts d at their lower ends, which permit the substitution of one size of gear for another, as may be required. It

is evident that the speed of the spindles can be regulated to the kind of work to be performed by using therewith such size of gear as will correspond and engage with one of the larger or smaller of the gear-wheels D, the hubs of these changeable gears being made of varying lengths, and formed on the one or the other side, so as to retain them at a proper height on the spindles to engage with the corresponding ones on the main shaft. E E are the nut-holder slides, arranged equidistant between the tap-spindles, and supporting on their upper ends the annular oil trough or reservoir F. f f are the taper-drip plugs, arranged vertically over the taps, constructed with an oil-passage, f<sup>1</sup>, which receives the oil at one side of the plug and discharges it through the plug at its lower end. They are fitted in taper holes in the bottom of the reservoir, a small recess, f<sup>2</sup>, being formed in one side of this hole, extending down from the top so as to open into the passage in the plug, when the latter is turned so as to cause them to coincide, as is clearly shown in Fig. IV. G represents a nut-holder; h, a tap; and I, stops secured and adjusted on the nut-holder slides. These stops are constructed of two pieces or halves, i i, fastened together by a screw, i', which also operates to clamp them to the slide. As two of these stops are required to be arranged on the same slide, and sometimes at the same elevation, I form the ends or jaws which encircle the slide with offsets on the contiguous edges of one-half their width, which permit the required adjustment, as shown in Figs. I and III. Motion is communicated to the main shaft by means of a bevel-pinion, J, on a horizontal shaft, meshing with a bevel-wheel on the lower end of this upright shaft. K is an annular oil-collector, similar to the reservoir F, arranged beneath the main table, so as to receive the oil and finer portion of the chips which descend through the hollow tap-spindles above.

In Fig. I the nut-holder is shown in the position in which it is arrested by the stops after it has passed the head of the tap, which permits the now threaded nut to slide down in the shank of the tap. The nut-holder being now elevated by the attendant, another blank is arranged in place, and the operation repeated till the shank is filled, when the nuts are

removed by withdrawing the tap from its spindle, in which it loosely fits. The nut-holders and stops are arranged with the slides, as shown in Fig. I, each holder resting against two slides, and each slide receiving the ends of two holders. The trough  $a^2$  serves as a receptacle to hold the blanks, so that they may be readily taken up by the attendant as he passes from one tap to the other.

The general operation of my machine, and the advantages which it possesses as to compactness, simplicity, and cheapness of construction, facility, and convenience in operating it, are sufficiently obvious.

What I claim as my invention is—

1. In machines for tapping nuts, the annular groove  $a^2$  in the bed A, arranged with a series of taps and tap-spindles, the former pointing upward and the latter arranged in the bed A, as hereinbefore set forth.

2. The arrangement, in relation to one another, to the table A, and central shaft C, of the series of tap-spindles, the series of fixed

gear-wheels, and the several series of interchangeable gear-wheels, substantially as described.

3. The connection of the upper reservoir F with the table A by means of the slides E placed respectively between and equidistant from the tap-spindles, as described, for the twofold purpose of supporting said reservoir and guiding the nut-holders, substantially as hereinbefore set forth.

4. The construction of the tap-holders with a hole in each extending from end to end, and, jointly therewith, the arrangement of them in the table in a circular series, as described.

5. The stops I, constructed in halves  $i$ , formed with offsets, and secured to the slides by a clamp-screw,  $i'$ , in the manner and for the purpose hereinbefore set forth.

JOHN N. DURRELL.

Witnesses:

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S. M. NEWTON.