W. CRIGHTON.

MACHINE FOR TAPPING NUTS.

No. 187,458. Patented Feb. 20, 1877.

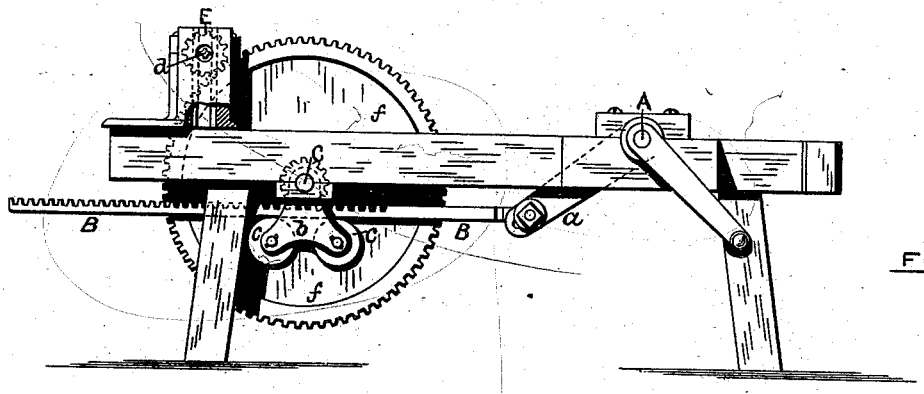

FIG. 1.

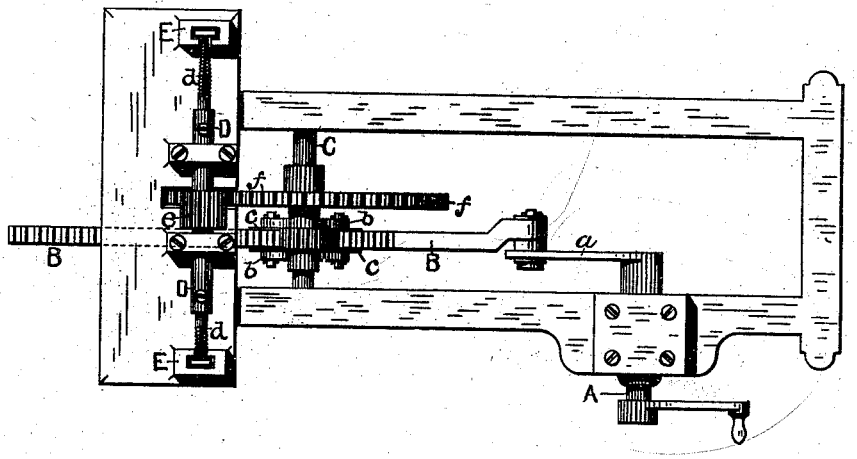

FIG. 2.

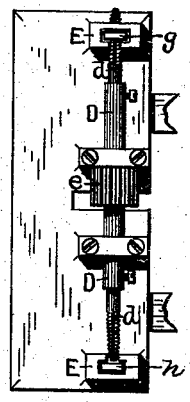

FIG. 3.

WITNESSES.

INVENTOR.

William Crighton

UNITED STATES PATENT OFFICE.

WILLIAM CRIGHTON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO THE AMERICAN SCREW COMPANY, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR TAPPING NUTS.

Specification forming part of Letters Patent No. **187,458**, dated February 20, 1877; application filed January 22, 1877.

To all whom it may concern:

Be it known that I, WILLIAM CRIGHTON, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Machines for Threading Nuts; and I do hereby declare that the following specification, taken in connection with the drawings furnished, and forming a part of the same, is a clear, true, and complete description thereof.

My improvements relate to that class of machines in which a spindle or shaft, having a tap at each end, is reciprocated both longitudinally and rotatively, so that the taps alternate with each other in threading nuts.

The object of my invention is to simplify the double-tap machine, and to secure an easier, smoother motion to the tap-spindle than has heretofore been attained.

My invention partially consists in the combination of two nut-blank holders, a double tap-spindle, which is moved longitudinally, wholly by contact with the threads of nuts, of the taps which cut the threads, a gear mounted on the tap-spindle, and a driving-gear which is intermittingly driven in opposite directions, and meshes with the spindle-gear.

A novel feature in the operation of my machine consists in the alternate longitudinal control of the tap-sprindle by each nut after the thread is cut, and while it is being released from the tap, the spindle having no longitudinal movement whatever except that which is due to the contact of one of the taps with the threads last cut by it in a nut; and my invention further consists in the combination, with the blank-holders, of a tap-spindle which is longitudinally controlled wholly by nuts within the holders.

To more particularly describe my invention, I will refer to the accompanying drawings, in which—

Figure 1 represents in side elevation a machine embodying my invention. Fig. 2 represents the same in plan or top view. Fig. 3 represents a top view of the tap-spindle, its taps, gear and bearings, with the spindle wholly disengaged from one of the nuts.

The frame of the machine is of simple construction, and requires no specific description.

The driving-shaft at A is provided at its inner end with a crank-arm, *a*, to which one end of a rack-gear, B, is connected by a crank-pin. C denotes a shaft, parallel with the driving-shaft. On it is a swinging hanger, *b*, which is provided with two friction-rollers, *c*, on which the free end of the rack-gear B is supported. The rack-gear engages with a pinion on the shaft C. D denotes the tap-spindle. It is supported by two boxes, which permit the spindle to slide freely therein, while revolving. It is provided with sockets and set-screws at each end for receiving and securing the two taps *d*. It has also between the two boxes a gear, *e*, which engages with its driving gear *f* on the shaft C.

From the description thus far, it will be seen that the rotation of the driving-shaft will impart a longitudinal reciprocating movement to the rack-gear, and that this will impart to the gear *f* and the tap-spindle a reciprocating rotary movement.

It is unnecessary to herein refer to the relative speed of the parts, or the number of revolutions made by the tap-spindle. It is obvious that the number of revolutions of the spindle will be varied according to the character of the thread required, and of the taps employed for cutting it. An adjustable connection of the rack-gear with the crank will be of practical value, because, by moving the crank-pin on the crank, the number of revolutions of the tap-spindle may be readily varied.

The two blank-holders are shown at E. They are located at opposite ends of the spindle. They are vertical, open at the top for receiving a blank, and at the bottom for discharging a finished nut.

It is to be understood that these holders are employed in connection with any well-known mechanism, by which an automatic feed of blanks is effected, and which presents each blank with its hole in a line with the tap.

A nut fully tapped is shown in one of the holders at *g*, Fig. 3, and a blank is shown in the opposite holder at *h*. The aggregate

length of the spindle and the taps when in position for service is so proportioned to the distance between the holders, plus the longitudinal movement of the spindle requisite to cut a thread that when one tap has completed its cutting service the other tap is wholly free from the nut just threaded by it, and therefore each nut, as soon as the thread is cut therein, serves to drive the spindle and the opposite tap into the next succeeding blank, and by the time the thread has been cut therein, the nut last threaded is wholly free from the tap which threaded it, and it falls downward in the holder, and is followed by another blank.

As compared with the weighted lever machines, it is obvious that mine operates with greater smoothness and without shock. It is also obvious that my machines are much simpler in construction than those embodying a leading-screw.

Each threaded nut in my machine operates as a temporary leading-screw until the opposite tap is fully under the control of the thread which it has partially cut in the nut occupying the opposite holder, and this last nut draws the tap from the opposite nut, and, when the spindle is reversed, leads that tap back into the next succeeding blank, and so on, as long as the supply of blanks is maintained in both holders.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with two nut-blank holders, a double tap-spindle, which is longitudinally controlled wholly by the contact of its taps with threads just cut by them in nuts within the holders, of a gear on the spindle, and a driving-gear which is intermittingly rotated in opposite directions, and meshes with the spindle-gear, substantially as described.

2. In a double-tap nut-threading machine, the combination, with the blank-holders, of a tap-spindle, which is longitudinally controlled wholly by nuts just threaded within the holders, substantially as described.

WILLIAM CRIGHTON.

Witnesses:
GEO. W. HARPER,
GEORGE FULLER.