(No Model.)

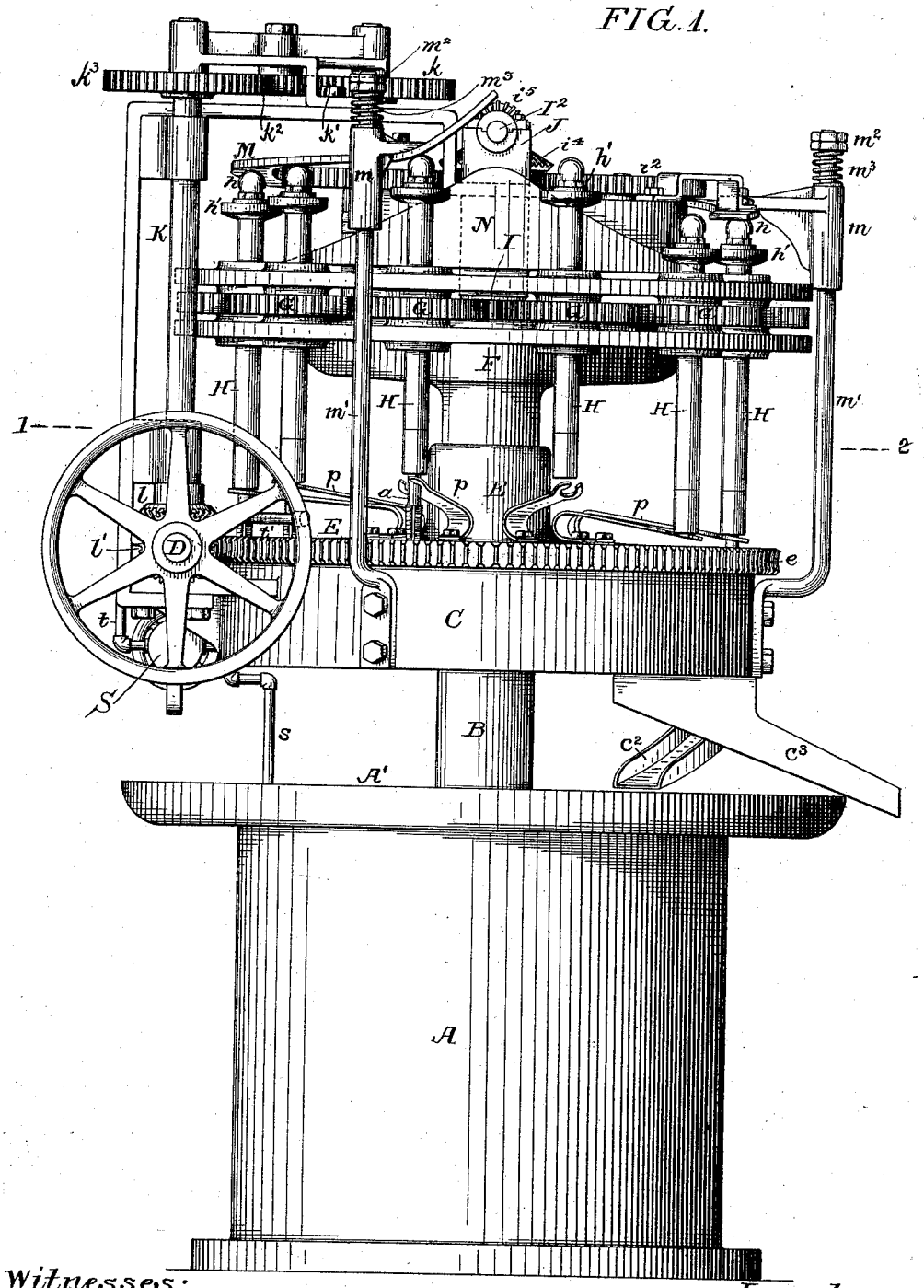
3 Sheets—Sheet 1.

T. S. DISSTON.

NUT TAPPING MACHINE.

No. 504,971. Patented Sept. 12, 1893.

FIG. 1.



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R. Schleicher.

Inventor:
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by his Attorneys
Henry & Howson

(No Model.) 3 Sheets—Sheet 2.

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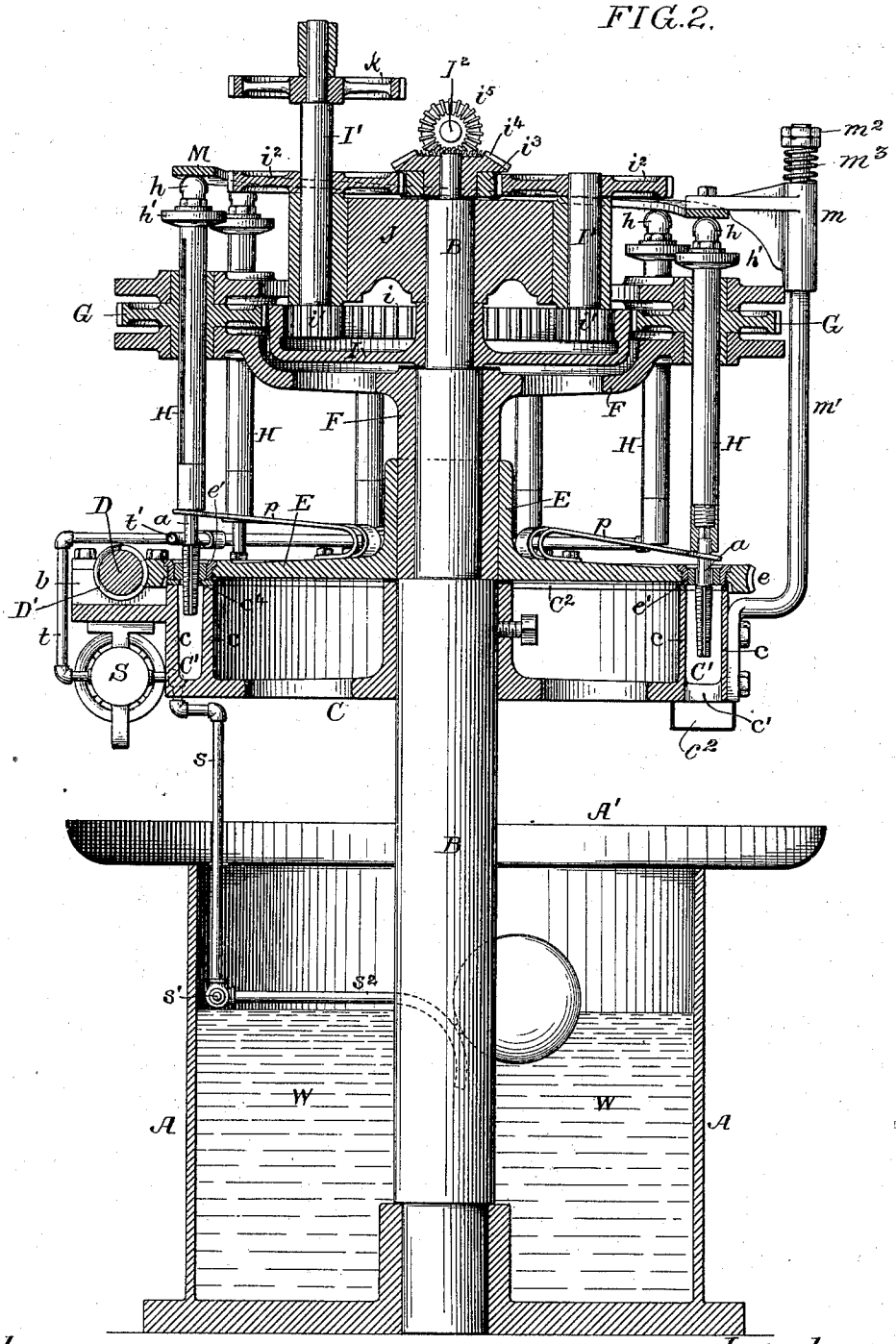
FIG. 2.



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(No Model.) 3 Sheets—Sheet 3.

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FIG. 3.

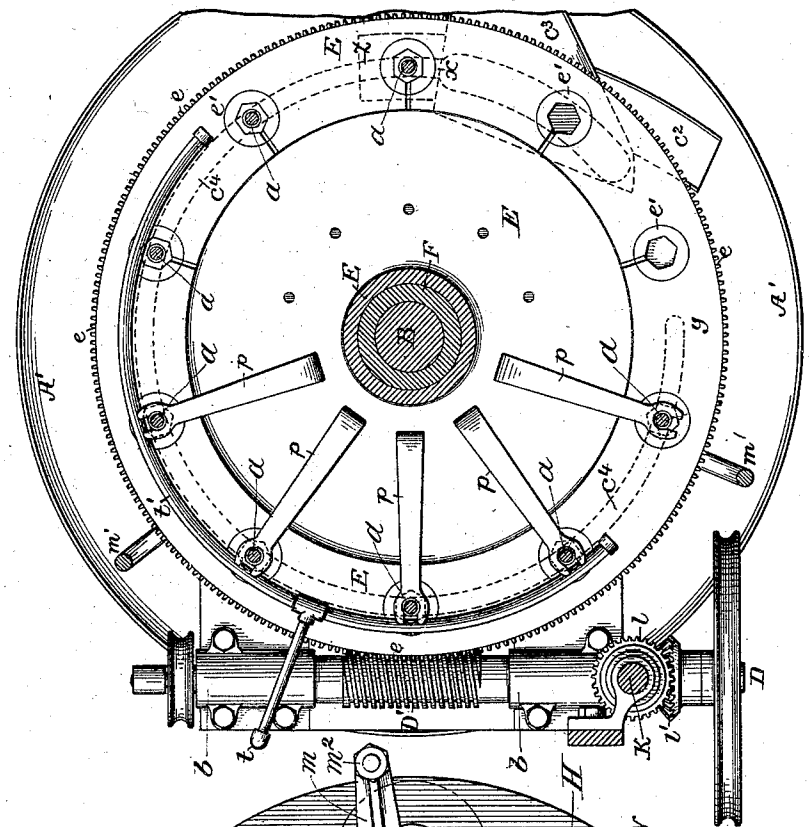
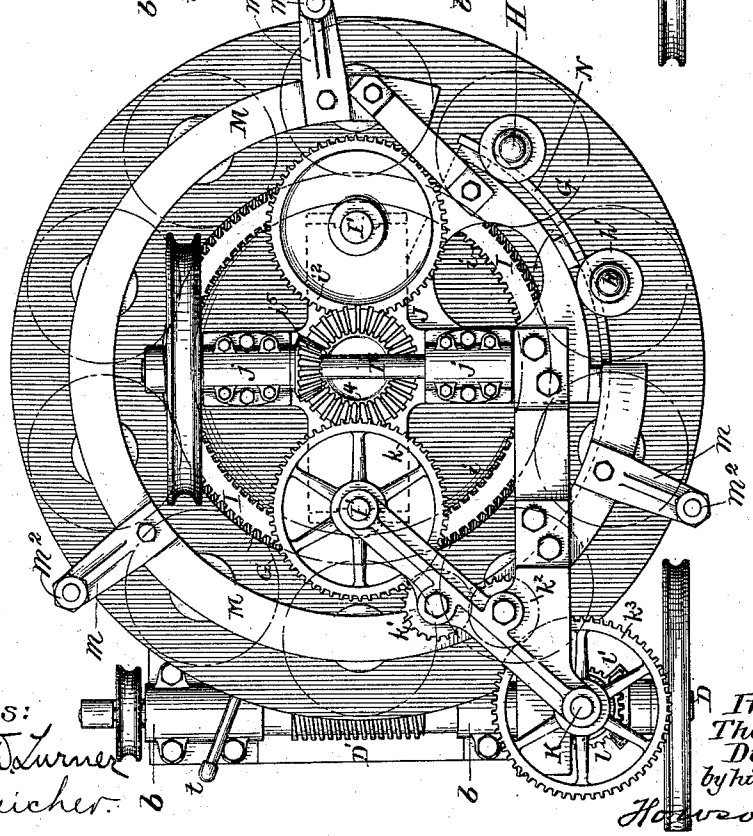


FIG. 4.



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UNITED STATES PATENT OFFICE.

THOMAS S. DISSTON, OF PHILADELPHIA, PENNSYLVANIA.

NUT-TAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 504,971, dated September 12, 1893.

Application filed November 12, 1892. Serial No. 451,759. (No model.)

To all whom it may concern:

Be it known that I, THOMAS S. DISSTON, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Nut-Tapping Machines, of which the following is a specification.

My invention relates to nut tapping machines in which a series of nuts are tapped in succession.

The object of my invention is to construct a machine in which the nuts are carried with the tap, and both tap and nut are discharged after the thread has been cut upon the nut, the tap being again mounted in the machine to cut another nut. By this means I am enabled to rapidly and accurately cut the threads in the nuts in an economical manner.

Referring to the drawings:—Figure 1, is a side view of my improved nut tapping machine. Fig. 2, is a vertical sectional view. Fig. 3, is a sectional plan view on the line 1—2, Fig. 1. Fig. 4, is a plan view of the machine.

A is the base of the machine, and projecting from this base is a central standard B upon which the mechanism is mounted. I would state here that I utilize the base A as a chamber for lubricants, used for lubricating the taps as the taps must be abundantly supplied with oil or other lubricants at all times, and by providing an oil tank at the base, I am enabled to use the oil over and over again, the drippings from the machine passing into the tank, and from there it is pumped up and flows to the several taps. The detail of this mechanism will be described hereinafter.

Mounted securely on the standard B is a fixed table C, having two flanges c, c forming a channel C′ in which travel the taps a as they pass through the nuts. A portion of the base of the channel is cut away as shown at c' in Fig. 2, to allow for the discharge of the taps and nuts into their respective receptacles through the chutes c^2, c^3. The chute c^2 is for the tap, and the chute c^3 catches the nuts and carries them away from the machine. The taps are discharged upon the platform A′ in easy reach of the operator who picks up a nut blank and a tap and mounts them in position in the machine.

Carried by the table C are the bearings b for the driving shaft D which rotates the nut carrier and spindle supporting frame around the central axis. The driving shaft D has a worm D′ which engages with the teeth e of the carrier E. This carrier is mounted on the hub of the spindle supporting frame F which can turn upon the standard B, the standard being reduced in diameter forming a shoulder upon which the frame F rests. The carrier E and frame F are secured together, and are driven from the shaft D.

Mounted at suitable distances apart in the frame F, are the wheels G in which are the spindles H carrying the several taps a, the taps being mounted in orifices in the lower portion of the spindle. The several spindles are splined to the wheels G so that they turn with the wheels; and the wheels in turn gear with the gear wheel I, which is mounted loosely upon the standard B, and has an internal set of teeth i which mesh with the pinions i' on the vertical shafts I′ which carry gears i^2 meshing with pinion i^3 mounted on the hub of the bevel wheel i^4. This bevel wheel is mounted on the upper end of the standard B and meshes with the bevel pinion i^5 on the driving shaft I^2 which is adapted to suitable bearings j on the frame J which not only carries the driving shaft bearings, but also the bearings for the vertical shafts I′. This frame J is attached to the standard B. In some instances the two driving shafts may be used, both being driven by belting or gearing, but I prefer to drive from one shaft, for instance the driving shaft I^2, and communicate motion to the shaft D through the medium of the gear wheel k carried by one of the shafts I′, intermediate wheels k', k^2, and gear wheel k^3 mounted on a vertical shaft K, which has a bevel gear wheel l at its lower end meshing with the bevel gear wheel l' on the shaft D. Thus the revolving frame is driven at the same speed as the spindle, and the parts are consequently in time.

Adapted to the carrier E are a series of nut sockets or clamps e', which receive the nuts to be tapped. These sockets are interchangeable and are screwed into the carrier frame so that by simply unscrewing the several sockets, other sockets may be mounted in the frames to receive nuts differing in size.

Resting on the table C is a platform C^2 which has a narrow channel c^4 in which the

several taps travel, this platform supporting the nuts during their passage through the machine. When the nuts reach the point x Fig. 3, the channel c^4 is enlarged allowing the nuts to fall away from the control of the carrier and drop into the chute c^3. The taps drop into the chute c^2 at a point in advance of the point x shown in Fig. 3. In some instances the taps will feed themselves into and through the nuts, but to insure the proper feeding of the taps, and to make the machine more reliable, I arrange directly above the several spindles H, an inclined way M which bears upon the heads h of the spindles, and this inclined way is of such a pitch as to correspond with the pitch of the tap. Consequently as the spindles with their taps are traversed from the feeding point y to the discharge x they are gradually forced into the nuts insuring accuracy in the cutting. After the spindles have left the point x they are transferred to the control of a cam N which is shaped as shown in Fig. 1, so as to raise the spindles up their full height, the cam acting upon the enlarged portion h' of the heads of the spindles, so that when the spindles reach the point y they are at their full height with ample room between the ends of the spindles and the nut carrier to receive both the tap and the nut to be tapped.

The inclined way M is supported by brackets m mounted on vertical rods m' attached to the table C, and between the brackets and nuts m^2 on the rods are springs m^3 which tend to press the inclined way M down upon the spindles, and also act as cushions in the event of an accident happening to one of the taps. Under each spindle is a spring steadying guide p for the taps; these guides are forked so as to span the shanks of the taps and steady them until the spindle passes over the ends of the taps and are in position to turn them and tap the nut, the guides yielding to the pressure of the spindles and returning to their raised position when released ready to receive another tap.

I will now describe the mechanism by which the oil is pumped from the reservoir to the several taps. Suspended from the table C is a pump S driven in any suitable manner; in the present instance I have shown a belt wheel mounted on the pump spindle. s is the suction pipe extending into the reservoir W formed in the base A. This suction pipe terminates in a float valve s' which cuts off the supply of oil when the float is at a certain level; the oil entering the pipe s^2, which also forms a float lever, passes up to the pump and is discharged through the pipe t to the curved pipe t' which has openings in its inner face so as to allow the oil to pass into the path of the taps, thus keeping the taps at all times lubricated when doing the greater portion of the work.

The operation of the machine is as follows: The operator is supplied with a given number of taps, sufficient to keep the machine charged to its full capacity, and the blanks are presented to the machine shaped and having the orifice of the given size. The operator takes a blank in one hand and a tap in the other and adjusts the tap to the blank, and mounts the tap and blank in the machine at the point y. The tap and blank are then carried around the machine, and at the same time the tap is turned upon its own axis while the nut is held and the tap consequently cuts the thread in the nut. When the tap reaches the point z it is released from the nut, having passed through it, and drops into the chute c^2, and the chute guides it onto the platform A′ in a position in easy access of the operator so as to be again used to tap another blank. The nut travels until it reaches the point x where owing to the enlarged opening, it is unsupported and consequently falls onto the chute c^3, and is directed to a suitable receptacle.

It will be understood that in some classes of work it is necessary to ream the nuts before tapping and by simply inserting reaming tools in the machine it can be used as a reaming machine without departing from my invention.

I claim as my invention—

1. The combination in a machine for tapping or reaming nuts, of the central standard upon which the mechanism is carried, the table fixedly mounted on said standard, the tap carrying frame sleeved upon said standard, the nut carrier sleeved upon and secured to said tap carrying frame, with mechanism for revolving the frame and carrier around the standard, and mechanism for revolving each spindle around its own axis, and with mechanism for feeding the taps into the blanks as they are traversed, substantially as described.

2. The combination of the central standard, the table fixed on said standard, a feed shaft mounted on said table, a worm on said feed shaft, a nut carrier, adapted to revolve around the standard, teeth on said carrier with which the worm engages, the carrier having sockets adapted to receive the nut blanks, the spindle supporting frame sleeved on the standard, and adapted to travel around said standard, said carrier being sleeved upon and secured to the said frame so as to travel therewith, wheels G, mounted on said frame, spindles mounted in said wheels and carrying taps, a driving shaft and intervening gearing between the shaft and the wheels G by which the several spindles are turned as they are traversed around the standard, substantially as described.

3. The combination in a machine for tapping or reaming nuts, of a central standard upon which the mechanism is carried, the table fixedly mounted on said standard the carrier for the nuts, a tap-carrying frame, and spindles carried by said frame and adapted to receive taps, with the mechanism for revolving the frame and carrier around the standard, the mechanism for revolving the

spindles, and the platform having a slot enlarged at one end, through which the nuts and taps are discharged, substantially as described.

4. The combination of the standard B, the table C, the slotted platform C^2, the nut carrier E, sockets therein for receiving the nut blanks to be tapped, spindle carrying frame mounted on the standard and secured to the nut carrier, mechanism for revolving the nut-carrier and spindle carrying frame, the tap spindles, wheels in which the spindles are so mounted as to turn with the wheels and slide therein, and a gear wheel having external teeth engaging with the several spindle wheels, and internal teeth engaging with the driving gear, substantially as described.

5. The combination in a nut tapping machine, of the nut carrier, the platform thereunder for supporting the nuts, the tap carrying spindles, a carrier therefor traveling with the nut carrier, the mechanism for revolving the nut and tap carriers around a common axis, and the mechanism for revolving the spindles around their own axes, with an inclined plane or cam for depressing the spindles, and cushions above said cam, substantially as described.

6. The combination of the table, the platform slotted to receive the taps, and adapted to support the nuts, the tap carrying frame and the nut carrier secured thereto and mounted upon the central standard, the mechanism for revolving the tap and nut carriers around the standard, the mechanism for revolving the spindles, and the devices for feeding the taps into the nuts independent of the nuts themselves, with the cam for raising the tap carriers, substantially as described.

7. The combination of the nut carrier and tap carrier, moving in unison, with a yielding guide p mounted under the tap carrier to steady the taps so that the carrier can pass over and engage with the taps, substantially as described.

8. The combination in a nut tapping machine, of the taps and carrier therefor and nut carrier, with an oil discharge pipe situated so as to oil the taps, a feed pump attached to the side of said machine, a reservoir in the base of the machine and a float carried by the suction pipe and operating a valve to control the flow of oil to the pump, substantially as described.

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

THOMAS S. DISSTON.

Witnesses:
HENRY HOWSON,
JOSEPH H. KLEIN.