No. 614,567. Patented Nov. 22, 1898.

F. A. MEISCHNER.

NUT THREADING MACHINE.

(Application filed June 1, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1

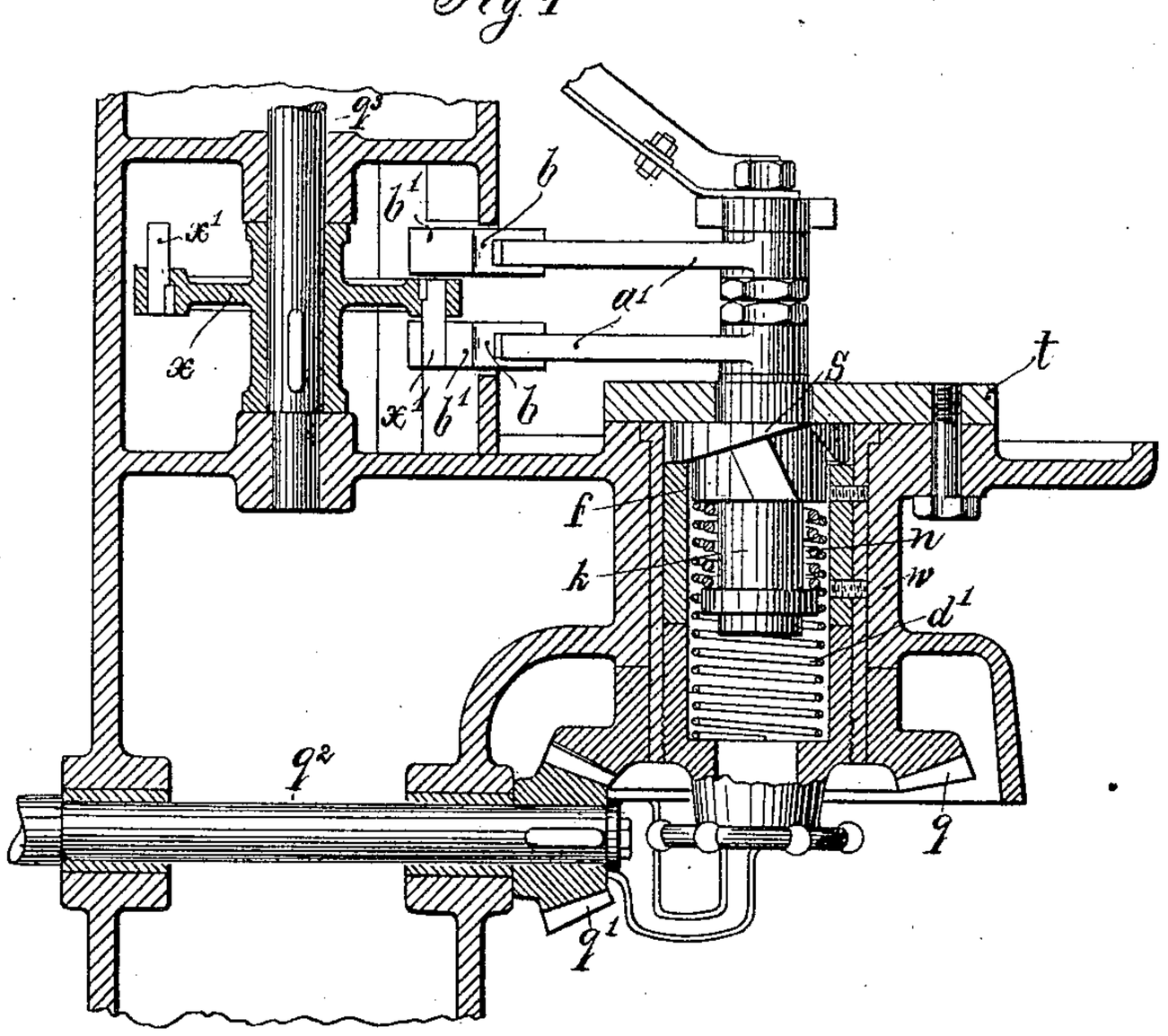
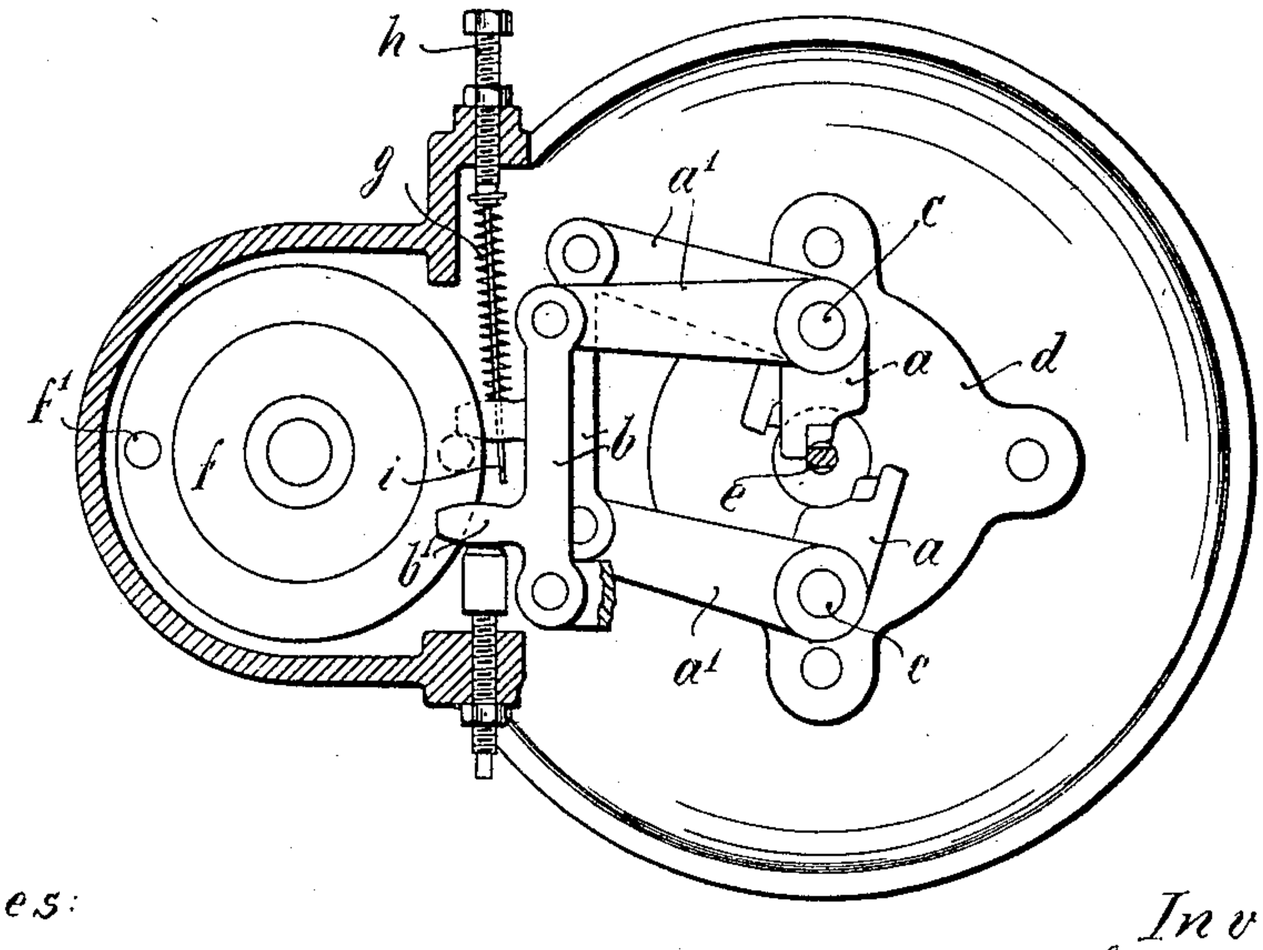


Fig. 2.



Witnesses:
Arthur Walther
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Inventor:
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Fig 3

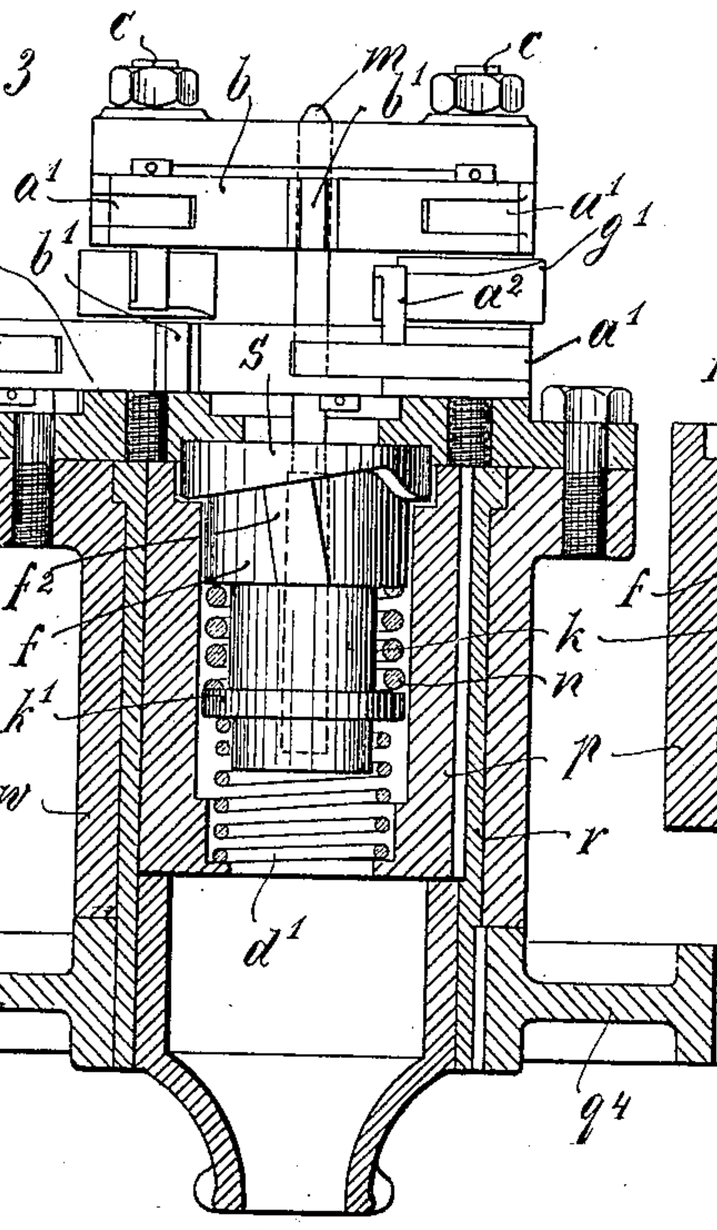


Fig 5

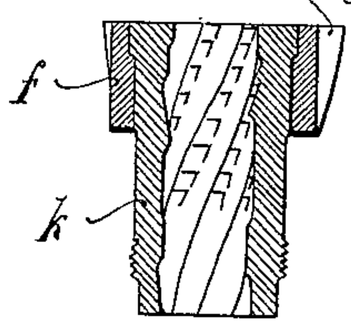


Fig 6

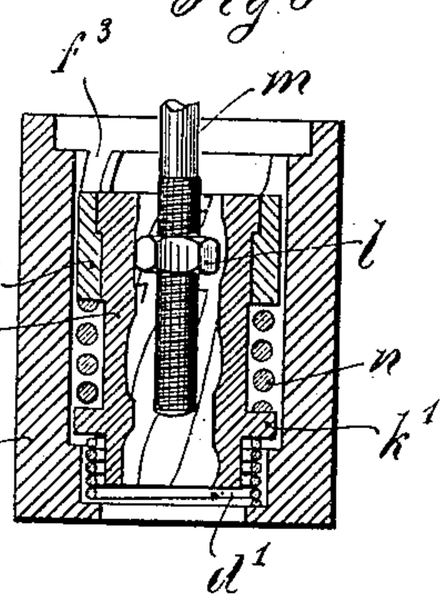


Fig 7

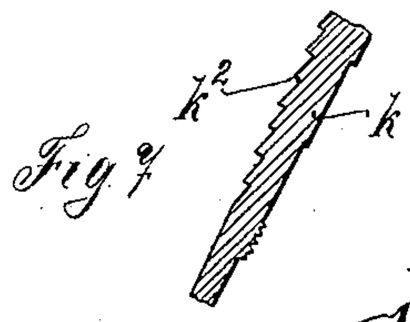


Fig 4

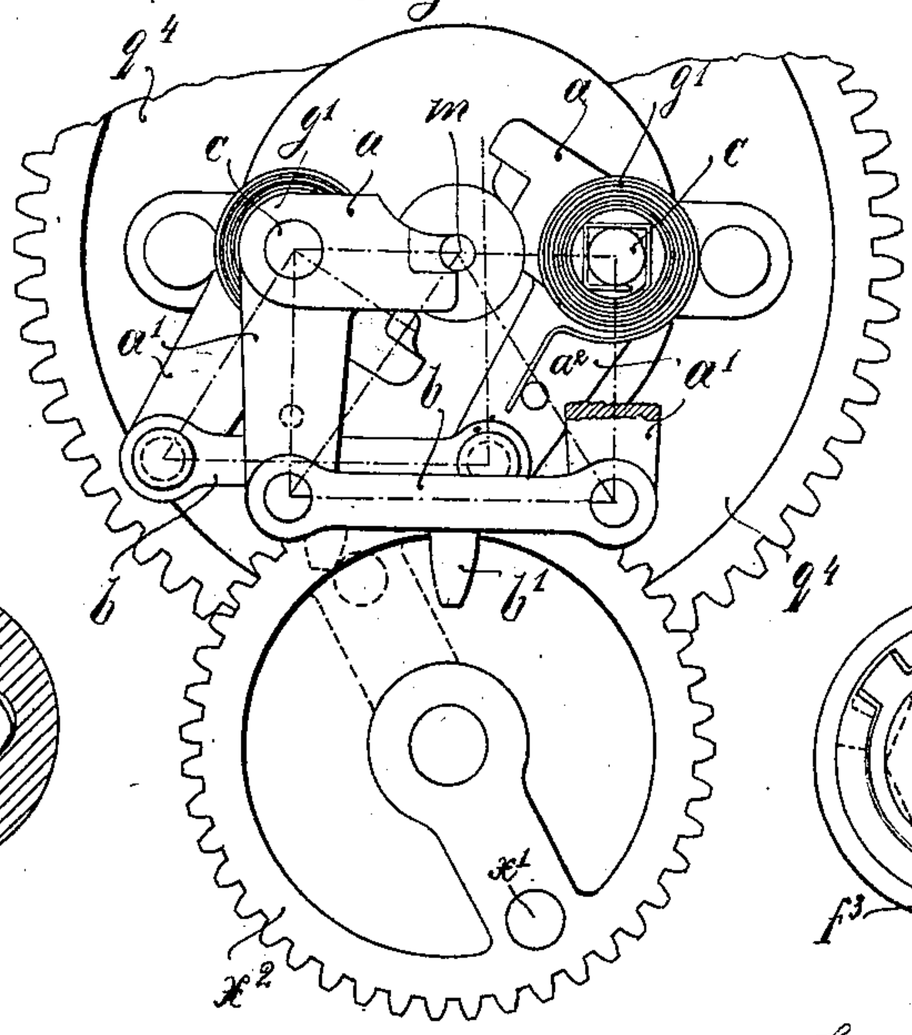


Fig 8.

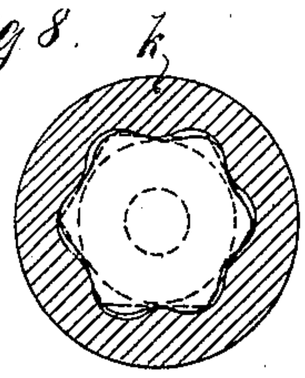
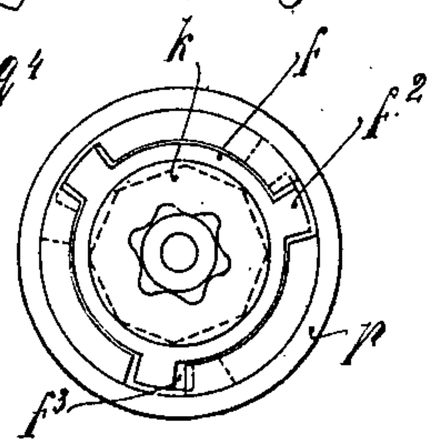


Fig 9



Witnesses:

Paul Seiler

Arthur Walther

Inventor:

Friedrich August Meischner

by Carl Gronert

Attorney

UNITED STATES PATENT OFFICE.

FRIEDRICH AUGUST MEISCHNER, OF CHEMNITZ, GERMANY.

NUT-THREADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 614,567, dated November 22, 1898.

Application filed June 1, 1898. Serial No. 682,312. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH AUGUST MEISCHNER, a subject of the King of Saxony, residing at 120 Zschopauerstrasse, Chemnitz, in the Kingdom of Saxony, German Empire, have invented a new and Improved Nut-Threading Machine, of which the following is an exact specification.

This invention relates to a nut-threading machine in which the nuts to be threaded are shoved upon one end of the screw-tap and are moved over the whole length of the latter, the nuts being set in rotation by a rotary box as soon as they arrive at the threaded portion of the screw-tap.

My invention consists in certain arrangements and combinations of parts, as are described hereinafter, and in order to make my invention more clear I refer to the accompanying drawings, in which similar letters denote similar parts throughout the different views, and in which—

Figure 1 is a vertical longitudinal section through the main working parts of my improved nut-threading machine. Fig. 2 is a plan of the mechanisms for holding the screw-tap. Fig. 3 is a side view, partly in section, of a slightly-modified form of construction, the modifications referring especially to the mechanisms aforementioned. Fig. 4 is a plan of said mechanisms. Fig. 5 is a longitudinal section through the box. Fig. 6 shows the box combined with some other parts and being just about to move a nut over the threaded portion of the screw-tap. Fig. 7 is a longitudinal section through the wall of the aforementioned box. Fig. 8 is a horizontal section through the same, and Fig. 9 is a plan of the said box with its neighboring parts.

The box k, which moves the nut l over the threaded portion of the screw-tap m, is provided with a collar k', against which bears a spiral spring n. The latter supports a sleeve f, which is so connected with the box k that it cannot be turned around the same. A rotation of the sleeve f will thus cause a rotation of the box k, but a longitudinal movement of the sleeve f will cause a similar movement of the box k only if the resistance which the latter finds in moving the nut over the threaded portion of the screw-tap is smaller than the strength of the spring n. If that resistance is greater, the box k will be displaced either but little or not at all, and the spring n will consequently be more or less put under tension.

The parts aforedescribed are located in a casing p, which is connected with a bevel-wheel q by means of a piece of tube or hollow shaft r. The bevel-wheel q is secured to the outer surface of said part r, and the casing p is secured to the inner surface of the same. The casing p is connected with the sleeve f by ledges or feathers f^2, which take into corresponding recesses or grooves f^3. I prefer to let these grooves and the feathers have an inclined position, so that said parts resemble parts of a screw with a very high pitch.

The bevel-wheel q gears with a bevel-wheel q', keyed to a shaft q^2. The bearings for the latter form parts of the frame of the machine, and said frame carries above the horizontal shaft q^2 a vertical shaft q^3, which will further be referred to hereinafter.

While the box k is rotated it is continually moved up and down by the action of a ring s upon the sleeve f or upon the ledges f^2 of the same, respectively. Said ring has as many inclined portions as there are ledges f^2 upon the sleeve f and is secured to a plate t, which in its turn is secured to the cylinder w, that serves as a bearing for the piece of tube or hollow shaft r.

The screw-tap m is located concentrically with regard to the box k and the threaded portion of the tap extends down into said box. The mounting device for the screw-tap consists of four bell-crank levers having each a shorter arm a and a longer arm a'. These levers are arranged in pairs, and the arms a' of each pair are connected by a link b, having a lateral projection b'. The levers are fulcrumed upon pivots c, projecting forth from the plate t aforementioned, and the arrangements of said pairs of levers upon said pivots is such that one pair is located above the other and the two short arms a of each pair move simultaneously in opposite directions when the arms a' or the connecting-link b are or is moved in one or the other direction. In the position shown in Figs. 2 and 4 the lower arms a have left the screw-tap m, but the upper arms a (one of the upper levers is left away in these figures in order to rep-

resent more distinctly the position of the respective lower lever at that time) have grasped the screw-tap between them, so that the latter remains in proper working position. In order to continually secure the screw-tap in this position, it is of course necessary that the screw-tap be always held by at least one pair of the lever-arms a, and each pair of levers should therefore be opened only after the other pair has been closed. To effect such a manner of operation of the levers, I make use of a rotary disk x, secured to the vertical shaft q^3, aforementioned, and having two projections or pins x'. The latter are located upon diametrically opposite sides of the disk x, and one pin extends in an upward, the other in a downward, direction. The plane of the disk x is located between the planes of the pairs of levers, and the positions of the projections b' of the connecting-links b of said levers is such that the lower projection may be actuated by the lower pin x', whereas the upper projection may be actuated by the upper pin. The direction of rotation of the disk x is opposite to that of the hands of a clock, and the disk x or the pins x' of the same, respectively, do not therefore effect the closing of the levers, but the opening of the same. To close the levers, the connecting-links b or the projections b' of the same, respectively, are put under the action of springs g, one end of which bears against said projections, whereas the other end bears against an adjusting-screw h. The latter serves also for holding one end of a rod i, the other end of which passes through a hole in the respective projection b'. The object of said rod is to hold the spring in proper position.

In the modified form of construction represented in Figs. 3 and 4 the helical springs g of Fig. 2 are replaced by spiral springs g', which are held by the upper ends of the pivots c and which bear against special pins a^2, screwed into the lever-arms a'. In all other respects the form of construction shown in Figs. 3 and 4 is similar to that shown in Figs. 1 and 2, except the bevel-wheel q of Fig. 1 being replaced by an ordinary cog-wheel q^4, Fig. 3, and the disk x of Fig. 1 forming a cog-wheel x^2, Fig. 4. The means for rotating the cog-wheels q^4 and x^2 may of course vary in a very wide degree, as is also the case with the means for rotating the shafts q^2 and q^3 of the form of construction first described.

The box k is supported in the casing p by means of a vertical spring d', the lower end of which rests upon an inner flange of the casing p and the upper end of which presses either against the sleeve f, Fig. 1, or against the collar k', Fig. 3, of the box k. The tension of the spring d' is of course increased when the sleeve f is depressed under the action of the inclined surfaces of the ring s, but this increase in tension does not influence the tension of the helical spring n', that is located between the sleeve f and the collar k'.

The nut to be threaded is shoved upon the projecting upper end of the screw-tap m and is placed upon the closed arms a of the upper pair of levers. These arms then open and the nut glides down upon the screw-tap until it is stopped by the lower arms a. Thereafter the upper arms close, so as to grasp the screw-tap, and the lower arms open, so as to let the nut glide farther down upon the screw-tap until it arrives at the threaded portion of the same. The nut has then also arrived at or in the upper part of the box k. In order to enable the latter to turn the nut upon the screw-tap or upon the threaded portion of the same, respectively, it is provided with as many grooves or ribs as there are longitudinal edges at the nuts. In other words, the section of the bore of the box k is not cylindrical, but cornered or preferably undulated, as represented in Fig. 8. I prefer to let the ribs or grooves have an inclined position, so that they represent parts of a screw with a very high pitch, (see Figs. 5 and 6,) and I further prefer to provide the upper half of each rib of the box with notches k^2, Fig. 7, of such a configuration that the remaining parts represent ratchet-teeth that are capable of preventing the nut from moving in an upward direction relatively to the box k. As soon as the nut has come in the reach of the upper part of the rotating box k the latter is moved in a downward direction by the action of the ring s upon the ledges f^2 of the sleeve f. This movement is transmitted to the box k by means of the spring n, and owing to the action of the recessed ribs of the box the nut l is pressed against the commencement of the threaded portion of the screw-tap m, and the threading of the nut is thus commenced. The nut is thus first put under the pressure of the sleeve f, and as the friction between the nut and the screw-tap increases the spring n is compressed and the nut is thereby put under the tension of this spring, so that the downward movement of the box k is shorter than that of the sleeve f. When the nut has been perfectly turned or screwed upon the screw-tap m, the resistance between it and the box decreases, which finally occurs in such a degree that the box k and the sleeve f are raised into their normal height by means of the spring d', which prior thereto has been compressed. The position of the sleeve f with regard to the ring s is at that time such that the ledges f^2 are not any more acted upon by said ring.

As soon as the box k has regained its former or original position it receives another nut, which prior thereto had been put upon the screw-tap m and had made its way through between the pairs of lever-arms a. The other or first nut is at that time located near to the end of the threaded portion of the screw-tap m, and owing to the downward pressure which the box k is subjected to under the action of the ring s upon the sleeve f the movement of the respective nut l over the end part of the screw-tap is accelerated. This accelera-

tion occurs while the subsequent nut is pressed by the ratchet-teeth k^2 of the box k against the commencement of the threaded portion of the tap m, and there are thus during that time two nuts acted upon by said box. Of course the second nut need not be brought in contact with this threaded portion of the tap until the first nut has completely left the latter, and I wish it to be understood that my improved nut-threading machine may well be used in one or the other way.

Having thus described my invention, what I claim, to be secured by Letters Patent of the United States, is—

1. In a nut-threading machine, the combination with a rotary box, a screw-tap extending into said box, and means for holding said screw-tap, of a rotary casing inclosing said box and a sleeve located between the casing and the box and being so coupled with either part as to transmit the rotary movement from the casing to the box but allow of a longitudinal displacement of itself as well as of said box; a stationary ring adapted to displace the sleeve, a spring adapted to transmit the displacement of the sleeve to the box, another spring adapted to support the box in the casing, and means for rotating the latter, for the purpose as described.

2. In a nut-threading machine, the combination with a rotary box, a screw-tap extending into said box, and means for holding said screw-tap, of a rotary casing inclosing said box and a sleeve located between the box and the casing; grooves provided in the casing opposite to the sleeve, feathers forming part of the sleeve and taking into said grooves, a stationary ring located above said feathers and adapted to displace the sleeve, the latter being so coupled with the box as to transmit its rotary movement to the box but allow of a longitudinal displacement of the latter, said feathers and grooves having an inclined position, so as to form parts of a screw with a high pitch, a spring or springs adapted to press said feathers against the stationary ring, and means for rotating the said casing, for the purpose as described.

3. In a nut-threading machine, the combination with a rotary box, a screw-tap extending into said box, and means for holding said screw-tap, of a rotary casing inclosing said box and being so coupled with the latter as to transmit the rotary movement to the box but allow of a longitudinal displacement of the same, the section of the bore of said box being such as to enable the latter to catch and rotate a nut located upon the screw-tap, the ribs located in the bore having incisions forming ratchet-teeth between them for the purpose as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

FRIEDRICH AUGUST MEISCHNER.

Witnesses:
EUGEN HUBEL,
A. REUCHER.