3 Sheets—Sheet 1.

C. D. ROGERS.

MACHINE FOR NICKING SCREWS.

No. 183,211. Patented Oct. 10, 1876.

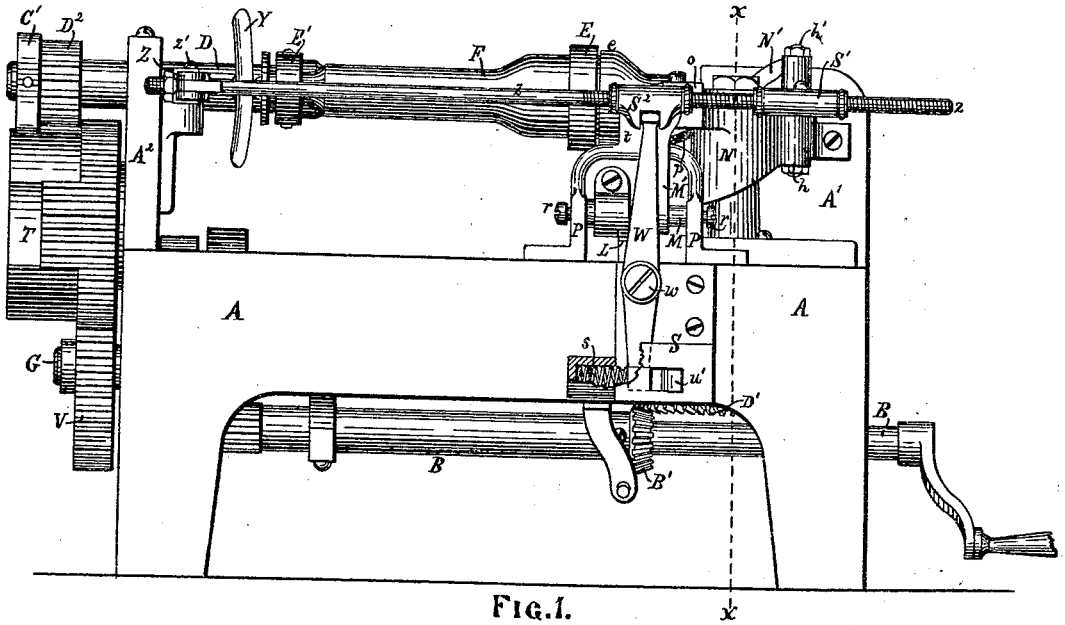

FIG. 1.

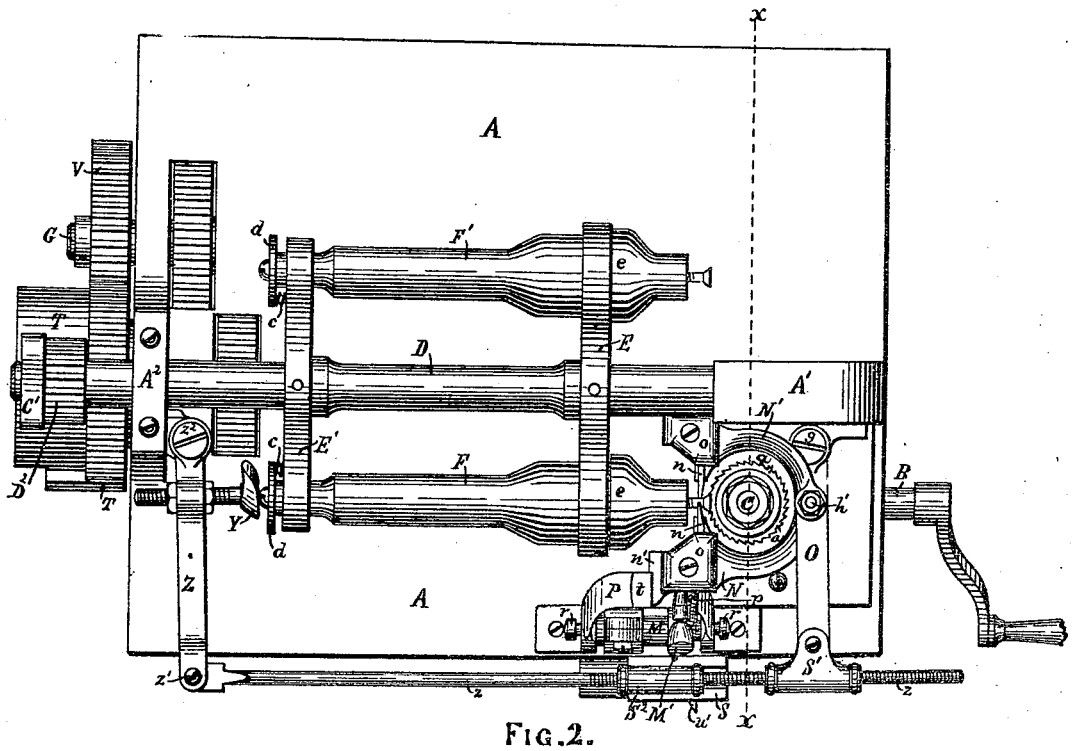

FIG. 2.

WITNESSES.

William W. Swan
H. G. Olmsted

INVENTOR.

Charles D. Rogers.

JAMES R. OSGOOD & CO. BOSTON

3 Sheets—Sheet 2.

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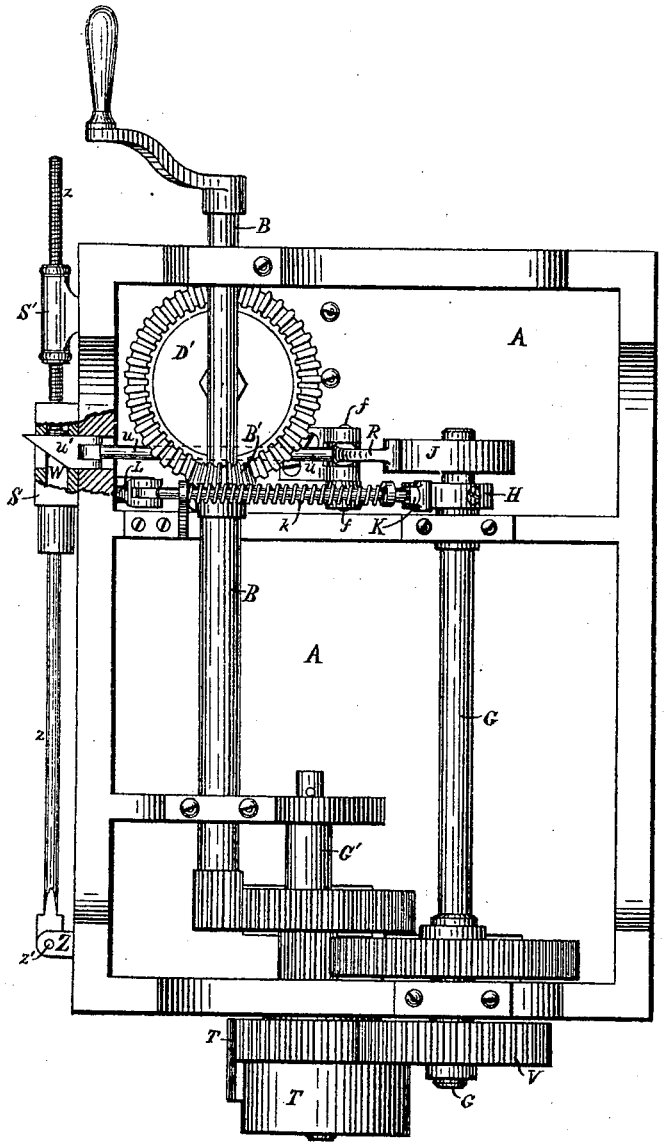

FIG. 3.

WITNESSES.

William W Swain

H. G. Olmsted

INVENTOR.

Charles D. Rogers.

JAMES R. OSGOOD & CO. BOSTON.

3 Sheets—Sheet 3.

C. D. ROGERS.

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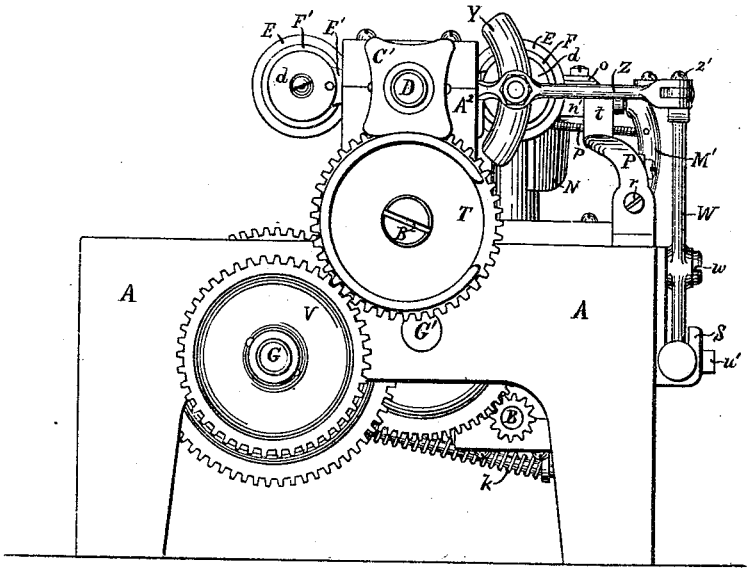

FIG. 4.

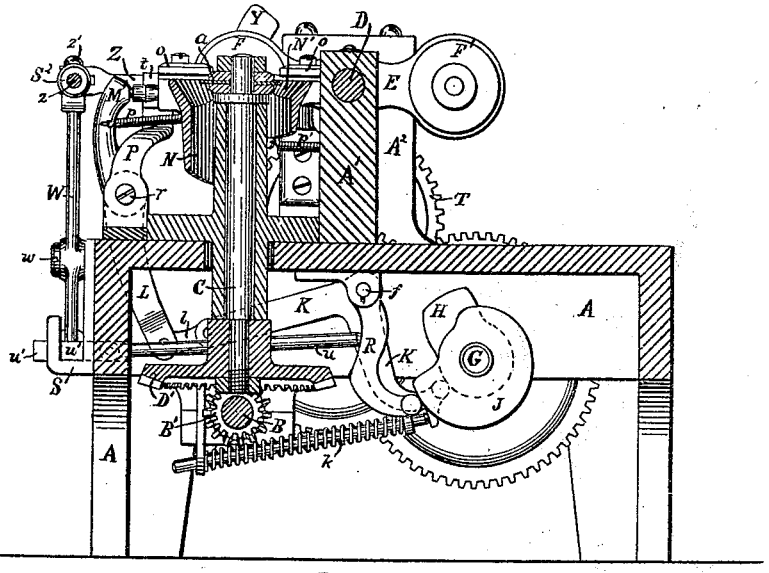

FIG. 5.

WITNESSES.

William W. Swan

H. G. Olmsted

INVENTOR.

Charles D. Rogers

UNITED STATES PATENT OFFICE.

CHARLES D. ROGERS, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN MACHINES FOR NICKING SCREWS.

Specification forming part of Letters Patent No. **183,211**, dated October 10, 1876; application filed August 16, 1876.

To all whom it may concern:

Be it known that I, CHARLES D. ROGERS, of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Machines for Shaving and Nicking Screws, of which the following is a specification:

In the manufacture of wood-screws it is usual to shave and nick the screw upon different sides of the same machine. The principal part of my invention relates to the nicking side of the machine; and consists in a contrivance for preventing the chucks from wabbling, and securing uniformity in the depth of the nicks.

My invention also consists in the employment, in a shaving and nicking machine, of a device for insuring great regularity in the revolution of the chucks. The invention is not concerned with the shaving side of the machine, excepting as regards the revolution of the chucks. As is usual in such machines, there are two chucks, which revolve about a common center, and the screws are received and discharged on the shaving side of the machine, in the usual manner. The two operations are carried on at the same time, the time for nicking a screw being the same which is required for receiving, shaving twice, and discharging, the order of operation being to shave, nick, and then shave again.

I proceed to describe as much of the double machine as is necessary to set forth my invention.

In the drawings, Figure 1 is a front elevation. Fig. 2 is a plan. Fig. 3 is an inverted plan; Fig. 4, an end elevation. Fig. 5 is a sectional elevation through the line *x x* in Figs. 1 and 2.

A is the frame or table. B is the main shaft, having bearings under the table. C is an upright shaft carrying the circular nicking-saw *a*, which is secured to its upper extremity by plates and a nut, as shown. The shaft C is operated from the main shaft by the bevel-gears D^1 and B^1, as shown. D is a shaft, having bearings in two standards, A^1 A^2, above the table, in which it makes a half-revolution at a time, by means hereinafter described. E and E′ are two yokes rigidly secured to the shaft D, in the eyes of which, as shown, are supported two chucks, F and F′, for holding the screw to be operated upon. The chucks have a slight longitudinal motion through the eyes; but springs *c c* between the yoke E′ and plates *d d*, secured to the rear ends of the chucks F and F′, tend to keep the chucks drawn back toward the rear end of the machine, the backward movement being limited by collars *e e*. G is a cam-shaft, carrying two cams, H and J, and geared to the main shaft through an intermediate shaft, G′, both the cam-shaft and the intermediate shaft having bearings under the table. K is a bell-crank lever hung upon a pin, *f*, in a projection under the table. A spring, *k*, keeps one end of the bell-crank lever K in contact with the cam H. Its other end is connected by a link, *l*, with a lever, L, rigidly secured to a rock-shaft, M, as shown. N and N′ are two jaws, pivoted to an arm, O, which, in turn, is pivoted at *g* to a projection from standard A^1. The two jaws N and N′ have independent pivots, N being pivoted below the arm O at *h*, and N′ above at *h′*. These jaws inclose the saw-shaft C, and have aprons to direct the course of the filings or dust falling from the screws. In a slot at the outer end of each jaw a small tooth, *n*, is secured by a plate, *o*, and set-screw, as shown. These teeth *n* at proper times close upon the screw just below the head, as shown in Fig. 2. A spring, *p′*, tends to draw the jaw N′ back from the screw against the standard A^1; and so likewise a spring, *p*, tends to draw the jaw N back from the screw toward a rocking lever, M′, which is a fixed projection from the rock-shaft M. This rock-shaft M rocks on two pins, *r r*, which have bearings in bent standard P, screwed to the table, as shown. In the upper part of the standard P is a projection, *t*, having in it a slot, in which rests a projection, *n′*, from the jaw N, the slot allowing the projection *n* a movement when the jaw N opens and shuts. Between the jaw N and the rocking lever M′ is a toggle, which permits the rocking lever to operate upon the jaw at any position in which the jaw may be placed, the spring *p* before mentioned keeping the toggle in place.

R is a curved lever, also hung upon the pin *f*. To it is attached one end of a rod, *u*, having at its other end a wedge, *w′*, which works through the side of the table, and through

slots in the arms (one arm being longer than the other, however) of a U-shaped projection, S, on the side of the table, against a similar wedge on the lower end of an arm, W, swinging between the arms of the U-shaped projection, and pivoted to the side of the table at *w*, as shown. A boxed spring, *s*, keeps the faces of the two wedges in contact, and thus keeps the curved lever R in contact with cam J. The two arms O and W are connected by means of a rod, *z*, having on it two slides, s^1 and s^2, so connected, respectively, with the arms O and W as to slide on the rod without binding. The rod *z* is threaded, as shown, and set-screws keep the slides s^1 and s^2 in any required position.

The operation of the mechanism thus far described is, that the cam H, at the proper time, permits the jaw N to close upon the screw, when the cam J, coming into play through the wedge before mentioned and the arm W, forces back the pivoted arm O, thereby tightening and drawing back the jaws, so as to force the screw-head against and toward the center of the revolving saw. This operation is attended with a serious difficulty. The teeth *n*, in drawing the screw toward the saw, frequently slip upon the bevel of the screw-head, and the screws are accordingly not carried a uniform distance forward, thus creating a want of uniformity in the depth of the nicks. And the same difficulty is found in all machines in which the teeth are used to draw the blank into the saw. Yet it is desirable to employ the teeth for this purpose, for otherwise much time is lost in receiving the blank in and in discharging it from the chuck, for where the teeth are not used the chuck must embrace within its grasp nearly the whole screw-blank up to the head, instead of a small portion near the end for the point.

The principal object of the present invention is to overcome this difficulty. This I have done by lengthening the rod *z*, and pivoting it at z^1 to an arm, Z, which is pivoted at z^2 to the standard A^2. To the arm Z is secured by set-screws, as shown, a plate, Y, somewhat cam-shaped, and capable of such adjustment as to receive the plates *d d* when chucks F and F′ are revolved about the shaft D, and to press against either plate when the chuck to which it is attached is in position to present a screw to the saw. Consequently, when the rod *z* is carried forward by mechanism previously described, thereby causing the teeth to close upon and draw forward the blank, the plate Y pushes forward the clutch in which the screw is held at the point by the ordinary contrivance, and in connection with the teeth, which, owing to the assistance of the plate, have no longer the same liability to slip, forces the screw-head an exact distance into or upon the saw, and the combined action of the plate and teeth keep the chuck and blank from wabbling. The plate Y, owing to its cam shape and independently of its motion on the arm Z, serves the further purpose of carrying the blank up as closely as possible to the saw before the mechanism is brought into play which is to carry forward the blank during the operation of nicking.

It only remains to describe the device for insuring regularity and exactness in the revolution of the chucks. Hitherto their revolution has been made or controlled by ratchets and springs. In place of such uncertain devices, I have substituted a gearing applied and operated as follows: V is a gear upon the cam-shaft G. T is a gear running on a fixed shaft, B^2, projecting from the table, as shown. It has two sets of teeth, or rather some of its teeth are longer than others, as shown. All the teeth take into the teeth of the gear V, whereby the gear T is in constant revolution. The long teeth, which are together, and all of which are seen in Fig. 1, take also at intervals into the teeth of a cog, D^2, upon the shaft D. The long teeth on gear T are sufficient in number to cause the shaft D to make exactly a half-revolution at every revolution of T. C′ is a four-sided plate on shaft D, just outside the cog D^2. Its edges are concaved to fit upon a part of the periphery of the gear-wheel T, which is without teeth, as shown in Fig. 5, a portion of said periphery being cut away to permit the plate C′ to make a half-revolution when shaft D does the same.

I claim—

1. In a shaving and nicking machine, the plate Y, operated in combination with the teeth *n* by mechanism substantially as described, for the purpose specified.

2. In combination with the chuck-shaft of a shaving and nicking machine, the gearing described, consisting of wheel T, cog D^2, and plate C′, arranged and operated from the main shaft, substantially as described.

CHARLES D. ROGERS.

Witnesses:
WILLIAM W. SWAN,
H. G. OLMSTED.