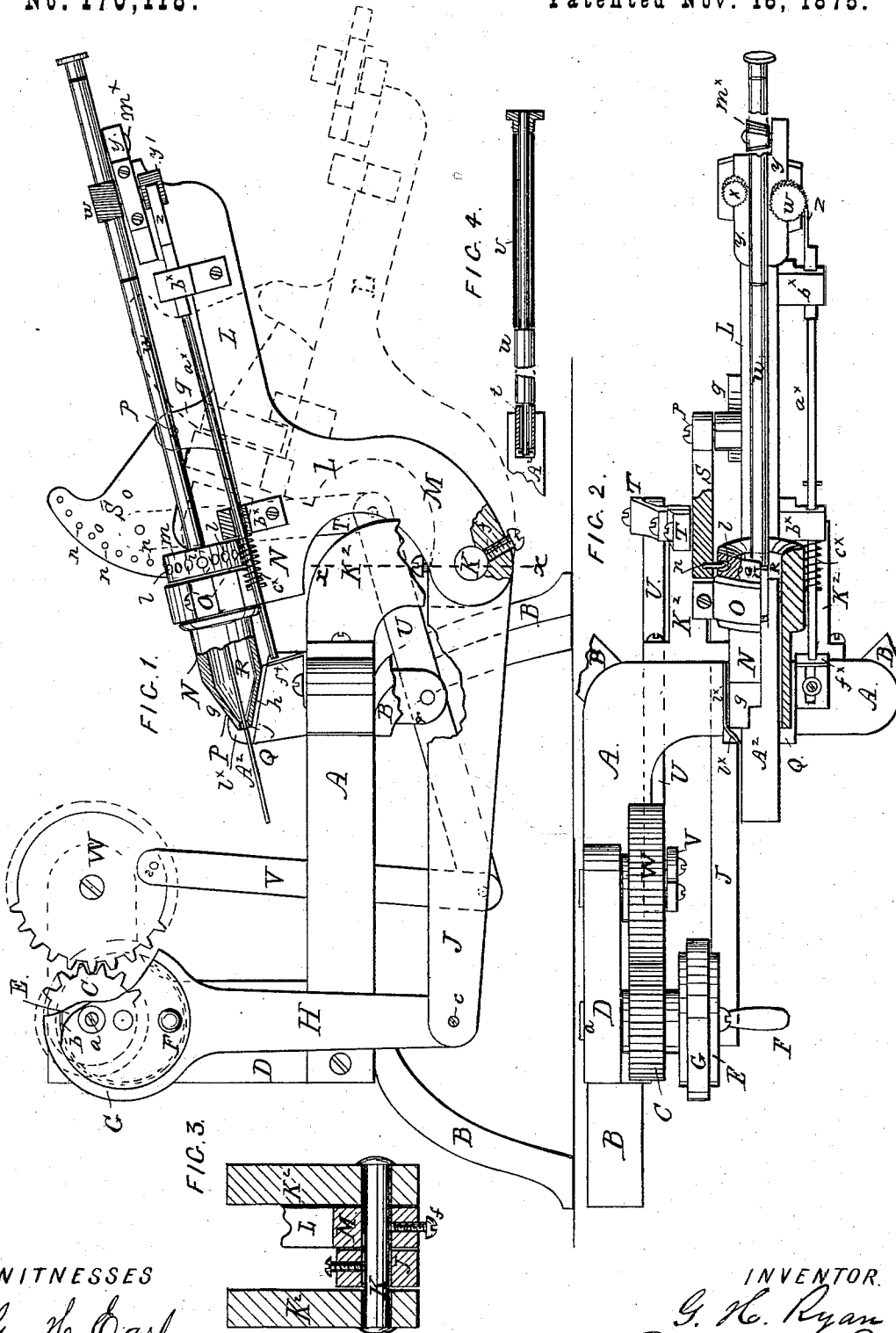


G. H. RYAN.
NAIL-PLATE FEEDER.

No. 170,118.

Patented Nov. 16, 1875.



WITNESSES

Geo. H. Carl
A. J. Roberts

INVENTOR.

G. H. Ryan
Per Brown Bros
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE H. RYAN, OF SOMERSET, MASSACHUSETTS, ASSIGNOR TO HIMSELF
AND JOB M. LEONARD, OF SAME PLACE.

IMPROVEMENT IN NAIL-PLATE FEEDERS.

Specification forming part of Letters Patent No. **170,118**, dated November 16, 1875; application filed
June 28, 1875.

To all whom it may concern :

Be it known that I, GEORGE H. RYAN, of Somerset, in the county of Bristol and State of Massachusetts, have invented new and useful Improvements in Nail-Plate-Feeding Machines, of which the following is a specification:

This invention pertains to mechanism, in machines for making nails, by which to feed a nail-plate forward, from time to time, to cutters suitably located and arranged with reference thereto, for being cut by said cutters into nails.

In the present arrangement of mechanism for the purpose stated, the nail-plate is fed regularly from time to time through a nose-piece to the plane of operation of the cutters, and this nose-piece, carrying with it the nail-plate, is reciprocally rotated about its axis in the same line with the direction of feed of the nail-plate, and also, together with its appendages for feeding the nail-plate through it and for reciprocally rotating it and the nail-plate, is moved toward and away from the plane of operation of the cutters, lowering as it moves toward and rising as it moves away.

As to the several movements—that is to say, the forward feed of the nail-plate, the reciprocal rotation of the nose-piece, the travel of the nose-piece toward and away from the cutters, and the rise and fall of the nose-piece—this invention consists in a novel arrangement and combination of mechanism hereinafter particularly described, by which the construction and arrangement of such mechanism necessary for such purposes is greatly simplified and otherwise improved, and the operation and movement thereof made the more accurate, perfect, regular, and steady, as will readily appear from the description thereof herein-after given.

In the accompanying plate of drawings the present improvements in nail-plate-feeding mechanism are illustrated, Figure 1 being a side elevation; Fig. 2, a plan or top view; Fig. 3, a vertical cross-section in plane of line *x x*, Fig. 1; and Fig. 4, a view of the feed-stem of nail-plate in longitudinal cross-section.

In the drawings, A represents a bed-piece,

which stands upon three legs, B B B, and carries the several stationary and working parts of the mechanism embraced in the invention; C, a vertical pinion-wheel arranged to turn on a journal, *a*, of the fixed post D of the bed-piece A; and E, an eccentric wheel, which is fixed to and turns with pinion-wheel C when power, in any suitable manner—as, for instance, through a crank or wrench handle, F—is applied to the pinion or eccentric; G, a ring or strap, which surrounds and lies loosely within the peripheral groove *b* of the eccentric E; and H, a rod, which runs from eccentric strap G to a lever-arm, J, and connects the strap thereto by a pivot-joint, *c*. The lever-arm J extends from the eccentric rod H horizontally under the bed A, and is fastened by a set-screw to a transverse horizontal shaft, K, arranged to turn in vertical parallel bracket-pieces K² K² fixed to and projecting downwardly from the bed-piece A. L, an arm, fastened by its curved part M with a set-screw, *f*, to the shaft K, hereinbefore referred to. The arm L carries the nose-piece N, also the device for feeding the nail-plate through the nose-piece, and also the device for reciprocally rotating the nose-piece, all as will be presently described. The nose-piece N, exteriorly, for a part of its length, is cylindrically shaped, and is arranged and confined within a bearing-block, O, on the upper face of the arm L, to be rotated about its longitudinal axis, and to be held on the arm against movement otherwise. The nose P of the nose-piece N is toward the plane of operation of the cutters of a nail-cutting machine, which are located at Q, and the nose is shaped as ordinarily—that is, by correspondingly tapering the nose on its two outer and opposite sides, *g* and *h*, and by forming an inner passage, R, from end to end—which, in part, is tubular, and in part at the point *j* of the nose P shaped to embrace the sides and edges of the nail-plate A², and hold said plate in the line of the longitudinal axis of the nose-piece N. *l l*, a series of tapering sockets in and around the periphery of collar *m* of nose-piece N. These sockets are arranged at equal distances apart, and with them interlock tapering pins *n*, which are ar-

ranged in the arc of a circle at corresponding equal distances apart on the face O of an arm, S, arranged vertically at one side of the nose-piece, and to turn on a pin, p , that is concentric with the arc of the said pins n , and is fixed to the upright post q of the arm L carrying nose-piece N. T, a rod, pivoted at one end to arc pin-gear S, above described, and at the other end to one end of a beam or lever arm U, which lever is hung on a fulcrum, r , of and under the bed-piece, and is pivoted to the lower end of a pitman-rod, V, that is hung eccentrically by a pivot, s , to a gear-wheel, W, gearing into the pinion-wheel C, hereinbefore referred to.

The nail-plate A^2 is secured to a loose sleeve, t , which is at one end of a stem or rod, u . The stem u is the feed-stem for the nail-plate, and for a portion of its length is surfaced with rubber v , w , and x , two spirally grooved or corrugated friction drums or pulleys. These corrugated drums w and x bear peripherally against the rubber v of the stem u , and their journals turn in a common bearing-plate, y , of the arm L, and their bearings in said plate are inclined, so as to bring the axis of both drums w and x at an angle to the axial line of the feed-stem u —that is, obtuse below said axial line, and at the side toward the entering end of the nose-piece—for the nail-plate A^2 . The corrugated drums w and x are of different diameters, and are arranged on their bearing-plate y on opposite sides of the feed-stem u , with the larger drum w somewhat in advance—that is, located nearer the nose-piece N than the smaller drum x ; y' , a ratchet-wheel secured to journal of larger corrugated drum w ; and z , a spring-pawl carried by a rod, a^x , arranged to move through ear-piece b^x at one side of the arm L; c^x , a spiral spring surrounding a portion of pawl-rod a^x , whereon it is arranged, and with a bearing against one of the guides b^x to press the rod a^x in a direction to carry its spring-pawl z backward over the teeth of the ratchet-wheel y' ; f^x , an abutment, secured by slot and set-screw to the bed-piece, in position to act against the forward end of the pawl-rod a^x .

The mechanism constructed and arranged as hereinabove described, with power suitably applied to the pinion-wheel C, operates, through the eccentric strap G and rod H and lever J, connecting the rod H to the carrier-arm L, for nose-piece N to move the nose-piece toward and away from the plane Q of operation of the cutters, and, by the swing of said carrier-arm L as it moves the nose-piece in the first direction, to lower the projection of nail-plate at its nose front P to the cutting-edge of the lower knife, and, as it moves the nose-piece in the second direction, to raise the nose-piece from the said cutting-edge, and again through the gear-wheel W, pitman V, rocking beam or lever U, and the rod T, connecting said lever U with the arc pin-gear S, to rock said pin-gear S, and thus, by its inter-

lock with the sockets l of the nose-piece, to reciprocally rotate the nose-piece about its longitudinal axis through one hundred and eighty degrees of a circle.

For these several movements of the nose-piece the mechanism herein described, by which they are produced, is arranged to secure each and all at the proper times, relatively to each other and to the operation of the nail-cutters, all as is well known without further explanation, and to bring the nail-plate into the position for the proper cutting of nails from said plate as it is fed forward through the nose-piece N. The feed of the said nail-plate A^2 through the nose-piece N is produced by the push of the abutment f^x on the pawl-rod a^x as the nose-carrier swings toward the plane of the operation of the cutters, which causes the pawl z to partially turn the ratchet-wheel y' , and thus the larger corrugated wheel w , carrying forward the feed-stem u of the nail-plate. The spring-pawl z moves back over the ratchet-teeth under the action of the spiral spring c^x while the nose-carrier N is swinging away from the plane of operation of the cutters, and thus it is made ready for another forward feed of the nail-plate, as above described. The inclination of the axis of the corrugated feed-drums w and x to the axis of the feed-stem of nail-plate causes the nail-plate, where it projects at the nose P of the nose-piece N, to be drawn and held firmly in its position on the lower knife-edge, thereby securing a better cut of the plate by the cutter. Placing one and the larger feed-drum w of the two drums w and x in the forward position described, causes the nail-plate to be forced sideways up and against the side guard l^x of the bed-piece, just forward of the nose-piece, which tends to secure a better cut of the plate by the cutters. The gear of tapering pins n , and the corresponding gear of tapering sockets l for driving the nose-piece N, as described, secures a most perfect and uniform movement to the nose-piece, and use has demonstrated such gears to work in a much better and more perfect manner than gears of ordinary and common shape.

The operating mechanism for a nail-plate feed herein described is, as is plain from an inspection of the drawings, substantially in the lower portion of the machine, and thus out of the way for a free access to those parts which it is most desirable to reach.

To readily tip the nose-piece away from the cutters in case it should be desirable, the arm L carrying the nose-piece is fitted loosely on its shaft K, so that by loosening the set-screw f , which fastens it to the said shaft K, it, with the nose-piece N, can be swung back to take the nose-piece away from the cutters, as, for instance, as shown in Fig. 1 by dotted lines. The attachment of the nail-plate to its feed-stem u , through a loose sleeve, t , allows the nail-plate to be rotated with the nose-piece N without rotating the feed-stem u proper. m^x ,

a roller on nose-carrier arm L, for supporting the feed-stem *u* at the rear of the feed-drums *w* and *x*. This roller is conical, and it is arranged so that the feed-stem *u* can ride over it along its length under the lateral action of the feed-drums *w* and *x* on the feed-stem *u*.

The elastic surface *v*, between feed-stem *u* and its operating feed-gears *w* and *x*, prevents slip between the gears *w* and *x* and the stem, and also secures a better hold of the gears on the stem to feed it forward as the gears are operated, as described.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the eccentric E, strap and rod G H, lever J, rock-shaft K, set-screw *f*, and arm L, substantially as and for the purpose set forth.

2. The combination of the nipper-rod and its elastic covering with the feed-drums *w* and *x*, substantially as and for the purpose set forth.

3. The combination of the nipper-rod and the feed-drums *w* and *x*, the feed-drum *w* being larger and set in advance of the feed-drum *x*, as and for the purpose set forth.

4. The combination of the nipper-rod, the feed-drums *w* and *x*, and the conical roller *m*^x, as and for the purpose set forth.

The above specification of my invention signed by me this 18th day of May, A. D. 1875.

GEO. H. RYAN.

Witnesses:

EDWIN W. BROWN,
GEO. H. EARL.