2 Sheets--Sheet 1.

J. CORNFORTH.

Nail-Plate Feeders.

No. 154,321. Patented Aug. 25, 1874.

Fig. 1.

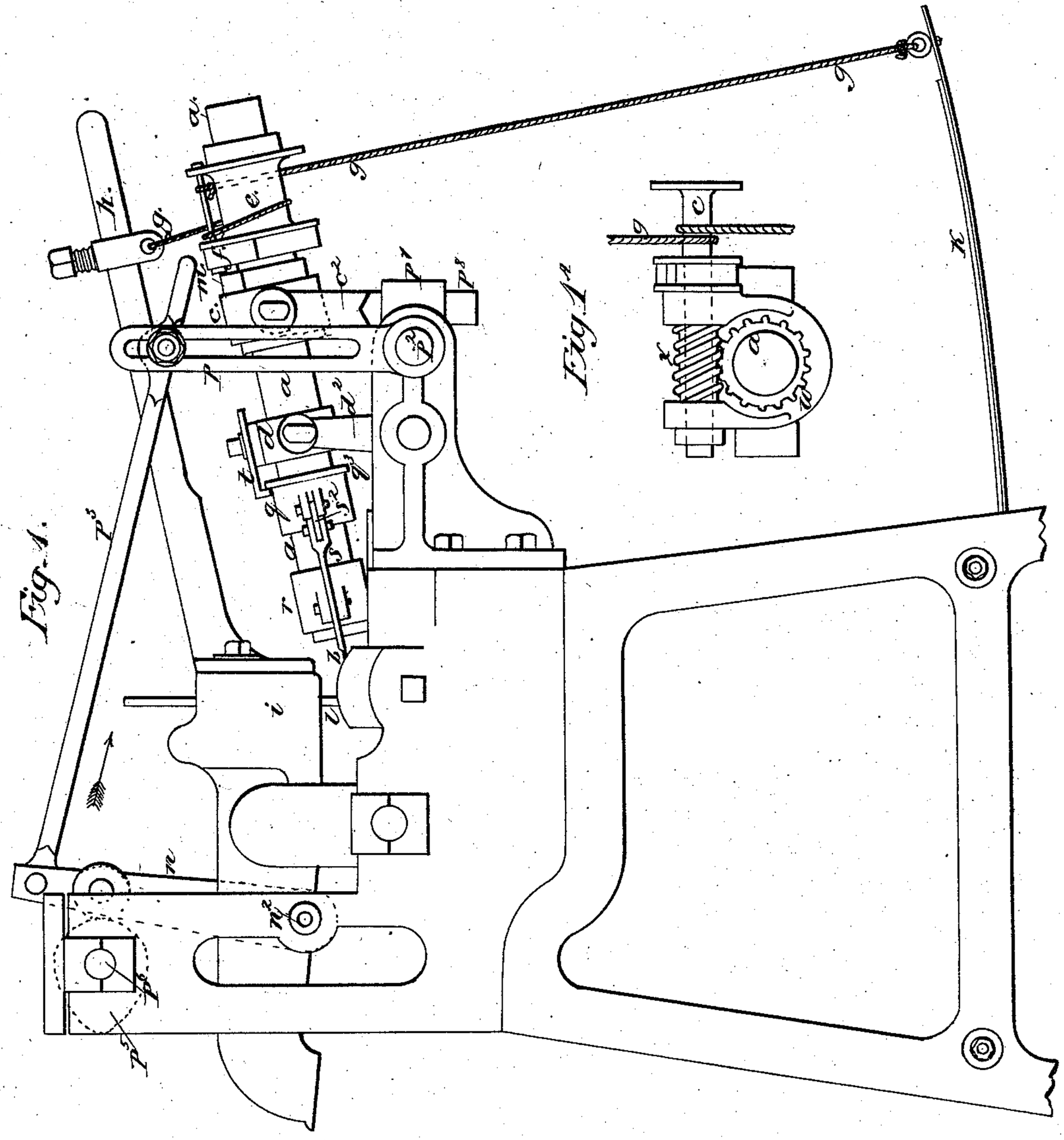

Fig. 1a.

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Henry Skerrett

Inventor:
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2 Sheets--Sheet 2.

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Fig. 2

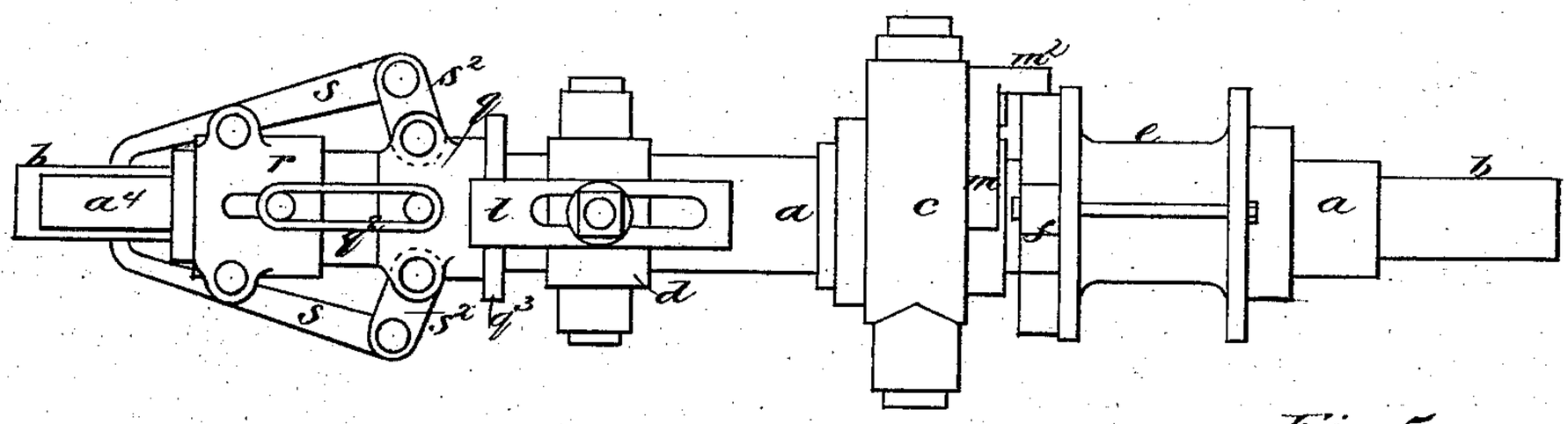


Fig. 3.

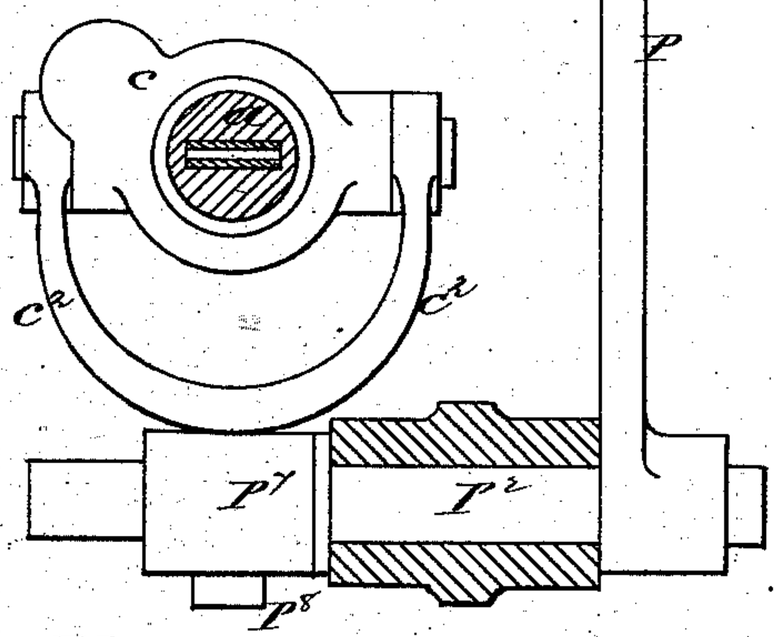


Fig. 4

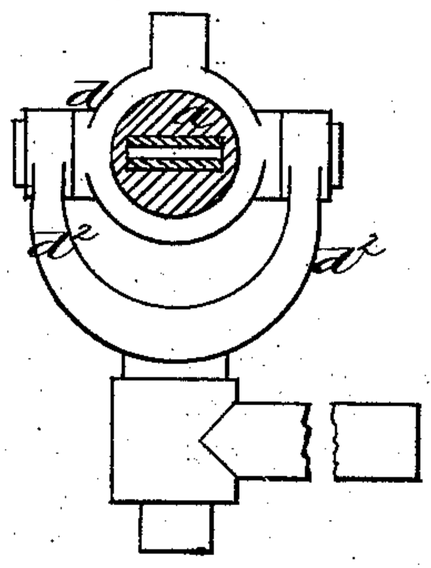


Fig. 5

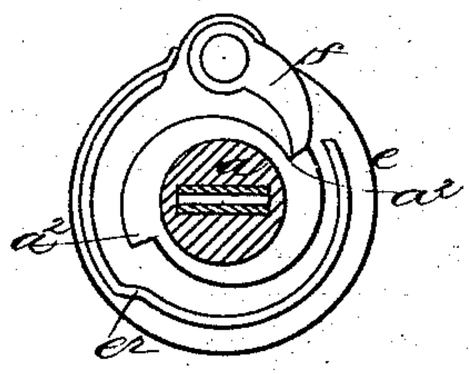


Fig. 6

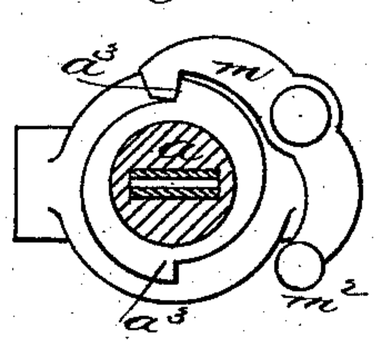


Fig. 7

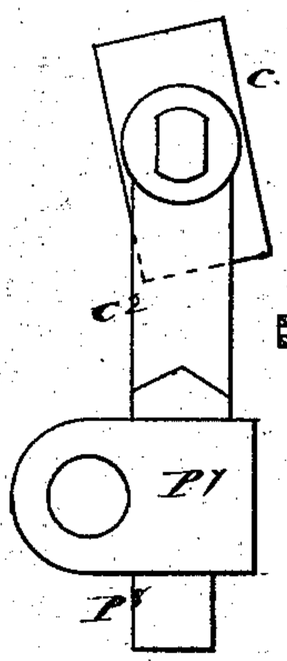
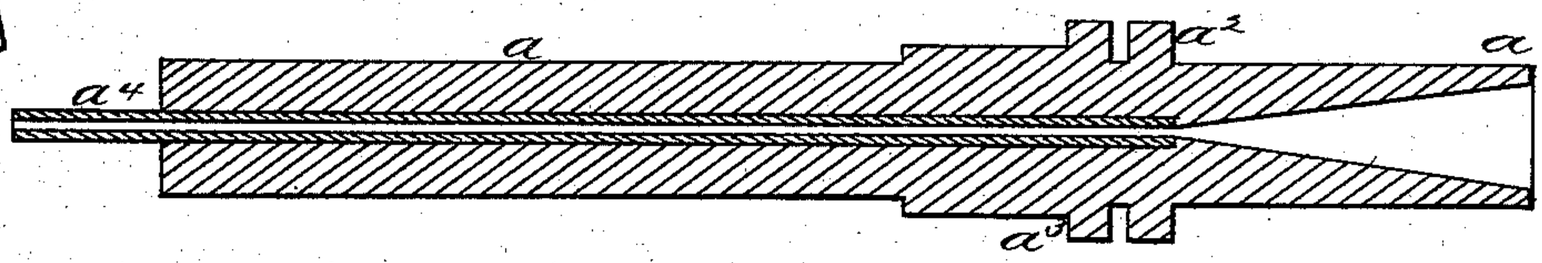


Fig. 8.



Witnesses

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JOHN CORNFORTH, OF BIRMINGHAM, ENGLAND.

IMPROVEMENT IN NAIL-PLATE FEEDERS.

Specification forming part of Letters Patent No. **154,321**, dated August 25, 1874; application filed July 25, 1874.

To all whom it may concern:

Be it known that I, JOHN CORNFORTH, of Birmingham, in the county of Warwick, England, manufacturer, have invented certain Improvements in Machinery for the Manufacture of Cut-Nails and Tacks, of which the following is a specification:

My invention has reference to that part of machinery for the manufacture of cut-nails and tacks by which the feeding into the machine and the turning over of the nail-strip or nail-plate from which nails or tacks are to be cut are effected.

The object of my invention is to effect the feeding of the said nail-plate or nail-strip in such a manner that the said nail-strip shall not only be turned over after the cutting of one nail and before the cutting of another, but shall also be moved longitudinally after the cutting of each nail, so as to withdraw the end of the nail plate or strip from against the cutter during the turning over of the said plate or strip, and its advance after it has been turned over into the required position for the cutting of the next nail or tack. The strip is also raised from the bottom cutter during the time it is being turned over.

Figure 1 of the accompanying drawings represents a side elevation of a nail or tack machine containing feeding mechanism constructed according to my invention. Fig. 2 is a plan of the feeding mechanism, drawn to a larger scale; and Figs. 3, 4, 5, and 6 are cross-sections of the same. Fig. 7 is an elevation of a part of the same, and Fig. 8 is a longitudinal section of the feeding-tube.

The same letters of reference indicate the same parts.

In this feeding mechanism the ordinary feeding-rod and tongs or clamps for holding the nail plate or strip are dispensed with. *a* is the feeding-tube, (shown separately in Fig. 8,) having a flat opening made across it to receive the nail plate or strip *b*. The said feeding-tube *a* has a spring nose-piece, a^4. The said feeding-tube *a* is supported in the cross-bearings *c d*, the said cross-bearings swiveling on the forked arms c^2 d^2, the arm c^2 being capable of a vibratory motion on its center, as hereinafter described. The forked arm d^2 has no motion. The intermittent rotatory motion of the feeding-tube *a*, for the purpose of turning over the nail plate or strip *b* at the proper time, is effected by the rotatory collar *e* on the said tube, the pawl or click *f* on the said collar acting in succession upon the ratchet-teeth a^2 a^2 (see Fig. 5) on the feeding-tube *a*. The alternate semi-rotation of the collar *e* is effected by the cord or catgut *g*, (passed around the said collar *e*,) arm *h* on the cutter-holder *i*, and spring *k*. A nail having been cut from the end of the nail-plate *b*, the cutter-holder *i* rises, and the arm *h* on the said holder lifts the cord or catgut *g*, which gives a semi-rotation to the collar *e*, which motion of the collar *e* is transmitted by means of the pawl *f* to the ratchet-teeth a^2 on the feeding-tube *a*, and the said tube is moved through a semi-rotation, and the nail-plate turned over, the nail-plate being also withdrawn and lifted from the cutter by the mechanism hereinafter described. On the cutter-holder *i* making its descending motion, a semi-rotation in the opposite direction is communicated to the collar *e* by the cord *g*, which is maintained in a state of tension by the spring *k*, the pawl *f* now sliding over the ratchet-wheel a^2, and hence communicating no motion to the feeding-tube *a*. The said feeding-tube now occupies the position represented in Fig. 1, and by the descent of the cutter *l* a nail or tack is cut from the end of the nail-plate, and so on. Instead of giving the semi-rotation to the feeding-tube by means of an arm on the cutter-holder, to which the cord or catgut is affixed, the same object may be obtained by means of an independent arm worked by a cam on the shaft p^6 of the machine. In order to prevent the feeding-tube *a* performing more than a semi-rotation on each motion of the arm *h*, the mechanism represented in Fig. 6 is employed. *m* is a stop-lever, the toothed end of which engages after each semi-rotation of the feeding-tube with one of the ratchet-teeth a^3 on the said feeding-tube. The stop-lever *m* is situated on the opposite side of the tube *a* to that on which the pawl *f* is situated, and when, by the motion of the rotating collar *e*, the pawl *f* has given a nearly semi-rotation to the feeding-tube *a*, the rise e^2 (see Fig. 5) on the collar *e* lifts the end m^2 of the lever *m*, and causes its opposite end to engage with

one of the ratchet-teeth a^3, and thereby prevent the further advance or motion of the said feeding-tube *a*. Instead of transmitting the motion of the rotating collar *e* to the feeding-tube *a* by the pawl-and-ratchet arrangement described and represented, the said motion may be transmitted to the feeding-tube *a* by means of a worm and worm-wheel, as represented in Fig. 1^A, where *w* is a worm-wheel on the feeding-tube *a*, with which worm-wheel a worm, *x*, on the axis of the fixed collar *c* gears, the said collar *c* receiving motion from the cord, catgut, or chain *g*, as before explained. Or, in place of the collar *c*, a pinion may be substituted, with which pinion a rack worked from the arm *h* gears. The nose end a^4 of the feeding-tube *a* is lifted and withdrawn from the fixed cutter during the turning over of the nail-plate by the following mechanism: *n p* are two oscillating arms, turning respectively on the centers n^2 p^2, the said oscillating arms being connected together by the jointed connecting-rod p^3, the handle end of which drops upon a pin or stud, p^4, on the said arm *p*. The arm *p* and parts connected with it are shown detached in Fig. 3. The oscillating arms *n p* are worked from the cam p^5 on the shaft p^6. The oscillating arm *p* is connected to the feeding-tube *a* through the forked arm c^2, the axis p^2 of the said arm *p* passing through the framing of the machine, and being fixed to an eye, p^7, in which the vertical axis p^8 on the forked arm c^2 engages. The forked arm c^2 is shown separately in Figs. 3 and 7, and the other forked stationary arm d^2 is shown separately in Fig. 4.

When the rise on the cam p^5 acts on the arm *n*, the said arm moves in the direction of the arrow, and a corresponding motion is given to the other arm, *p*, through the connecting-rod p^3. As the arm *p* makes its vibratory motion, the same motion is given to the forked arm c^2, the said arm c^2 turning on its center p^2, and the feeding-tube slides in the bearing *d*, and is moved toward a horizontal position, so as to withdraw the feeding-tube from the centers, and lift the nose end of said tube from the lower cutter. As the feeding-tube takes a nearly horizontal position, the cross-bearings *c d* of the forked arms c^2 d^2 swivel on their centers. After the nail-plate has been turned over, and the cam p^5 ceases to act upon the arm *n*, the feeding-tube makes its advance motion, and returns to the position represented in Fig. 1. The advance motion of the feeding-tube and parts connected with it is effected by a spring acting on the arm *n*. The feeding of the nail-plate *b* is effected in the following manner: *q* is a sliding collar on the feeding-tube *a*, connected by the spring q^2 to the sliding collar *r* on the said tube *a*. On opposite sides of the collar *r*, levers *s s* are jointed, the longer arms being connected by the links s^2 s^2 to the sliding collar *q*. On the top of the cross bearing-piece *d* of the forked arm d^2 is an adjustable hooked plate, *t*, the hook of which engages with a flange, q^3, on the sliding collar *q*. Just before the feeding-tube *a* reaches the end of its retiring motion from the cutters, the flange q^3 comes against the cross-bearing *d*, and the retiring motion of the griping-levers is arrested; the gripe of the said levers upon the nail-plate *b* being at the same time tightened. The feeding-tube *a* continuing its retiring motion, the spring nose-piece a^4 slides back upon the stationary nail-plate *b*, which nail-plate is thus advanced out of the spring nose-piece a^4 a sufficient distance for the cutting of another nail or tack blank on the advance of the feeding-tube. The said feeding-tube *a* advancing toward the cutters, the flange q^3 no longer pressing against the cross-bearing *d*, the tightness of the gripe of the levers *s s* is relaxed; and when the flange q^3 is arrested by the hooked arm *t*, the said gripe of the forked levers *s s* upon the nail-plate is altogether removed, and the nail-plate *b* is carried between the cutters by the gripe of the spring nose piece a^4 of the feeding-tube *a*.

Having now described the nature of my invention and the manner in which the same is to be performed, I wish it to be understood that I do not limit myself to the precise details herein described and illustrated, as the same may be varied without departing from the nature of my invention; but

I claim as my invention of improvements in machinery for the manufacture of cut-nails and tacks—

1. The feed-tube having an intermittent movement of semi-rotation, as described, in combination with the swiveled cross-bearing *d* and cross-bearing *c*, swiveled in a yoke or frame, to which an up-and-down movement is imparted, in the manner described, whereby the feed-tube during its movement of rotation is lifted and withdrawn from the cutter, and upon completion of said movement of rotation is advanced again to the cutter, as and for the purposes set forth.

2. The feed-tube having an intermittent movement toward and away from the cutter, as described, and the sliding collars *r q* and bearing *d*, in combination with the hooked arm *t* and the griping-levers *s*, pivoted to collar *r*, and connected by links with collar *q*, for joint operation, as shown and set forth.

3. The feed-tube, supported in cross-bearings, and provided with ratchet-teeth a^2, in combination with the collar *e*, having a movement of semi-rotation alternately in opposite directions, the click *f*, carried by said collar, and the stop-lever *m*, for operation as shown and described.

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