(No Model.)

2 Sheets—Sheet 1.

J. H. DUNBAR.

NAIL PLATE FEEDER.

No. 309,830. Patented Dec. 30, 1884.

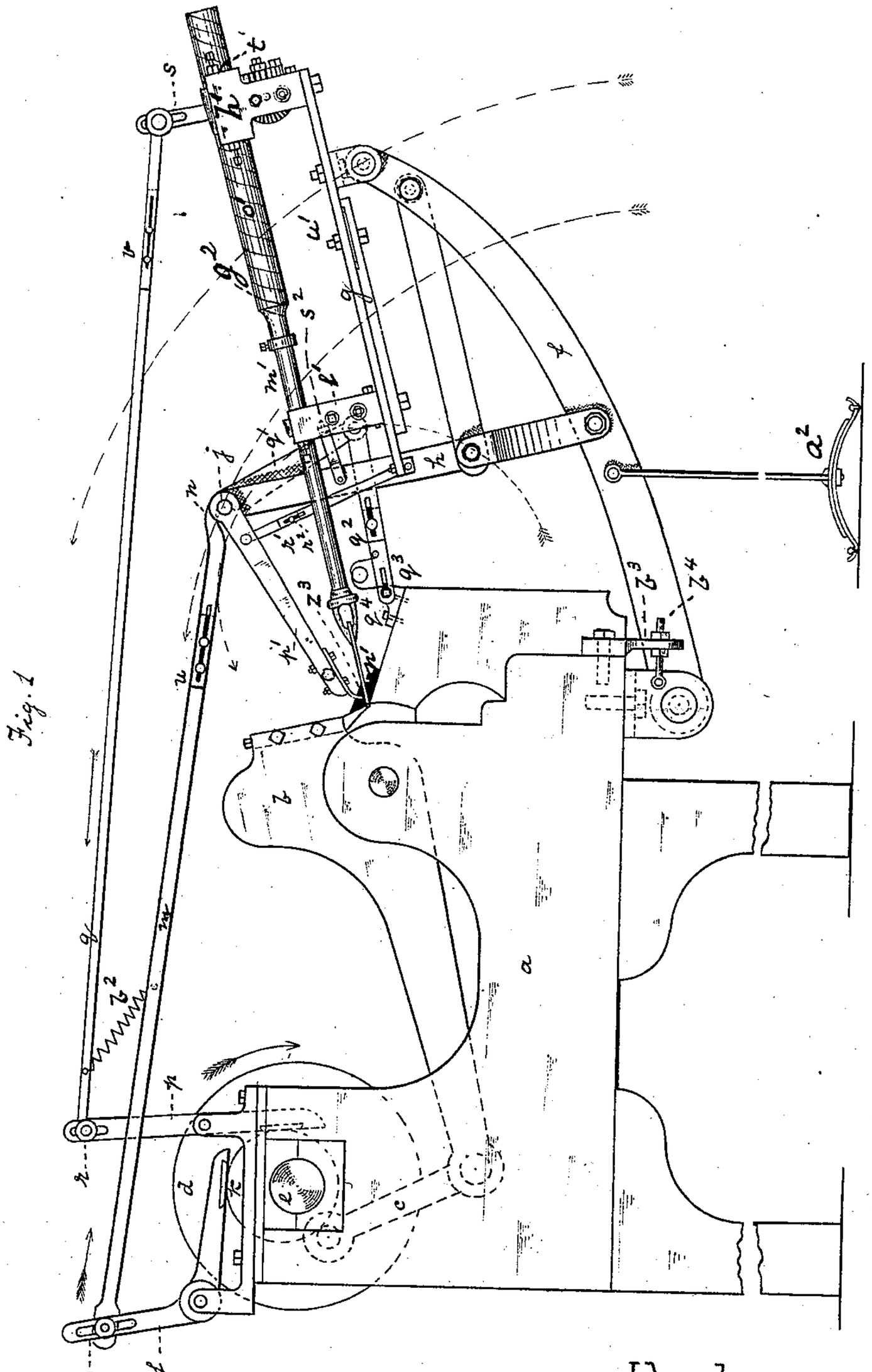

Fig. 1

Witnesses.
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Inventor.
Junius H. Dunbar
by his attorneys
Bakewell & Kerr

(No Model.)

2 Sheets—Sheet 2.

J. H. DUNBAR.

NAIL PLATE FEEDER.

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Fig. 2.

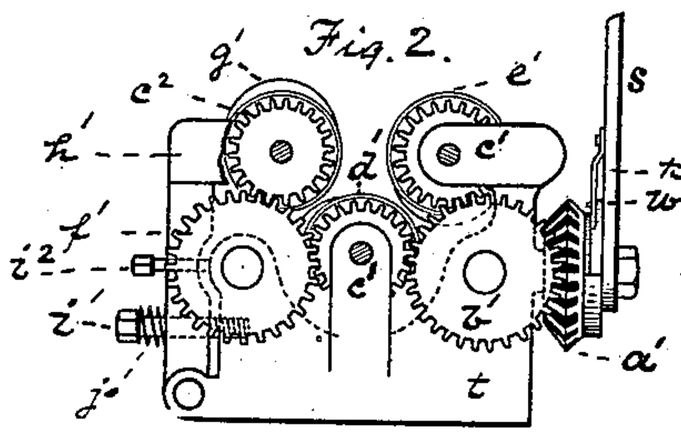


Fig. 3.

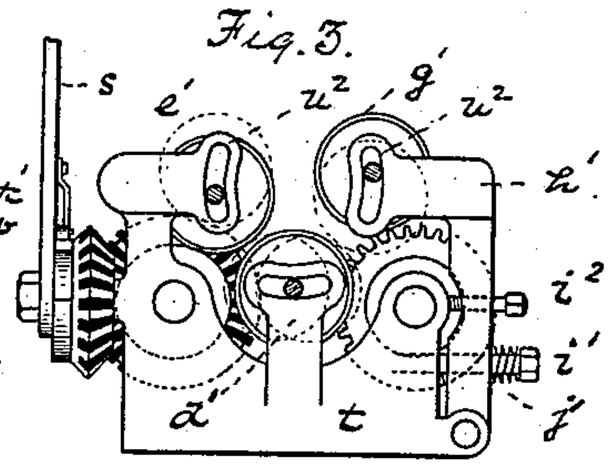


Fig. 4

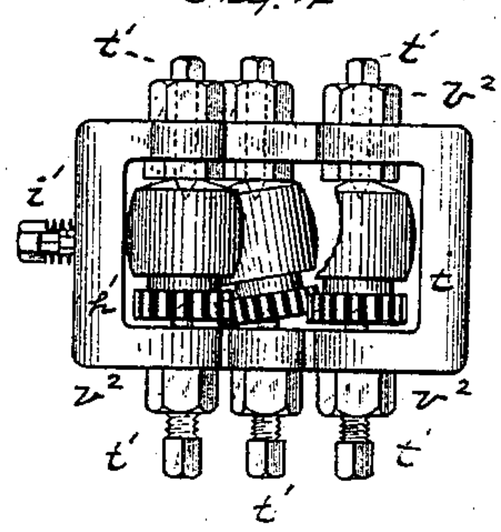


Fig. 5.

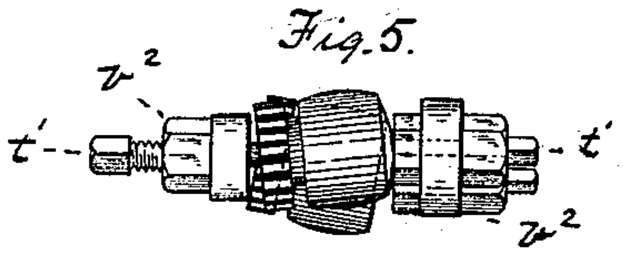


Fig. 6

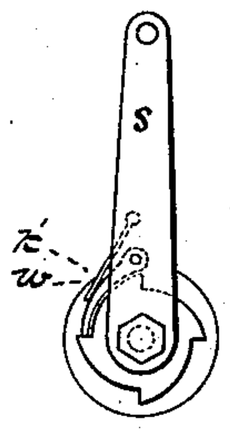


Fig. 7

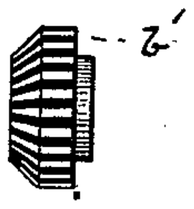


Fig. 8

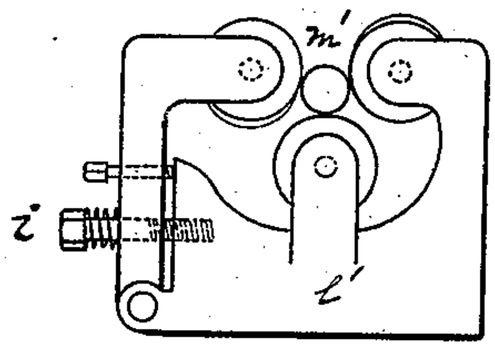


Fig. 9

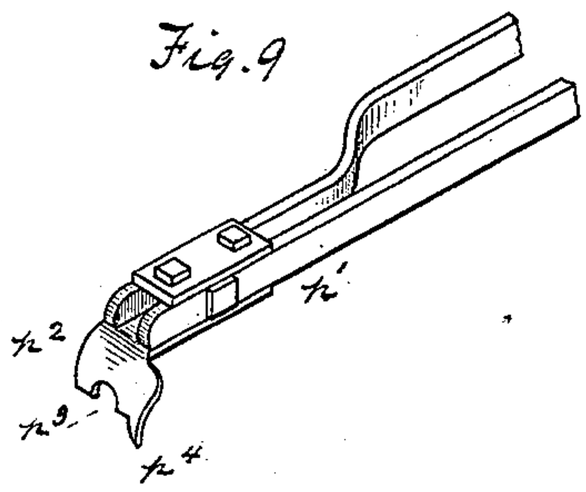


Fig. 10

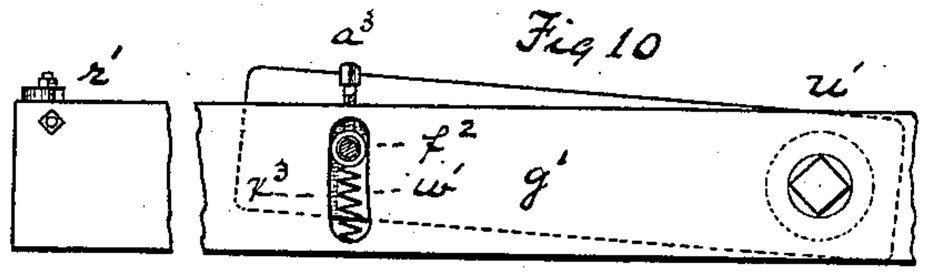


Fig. 11

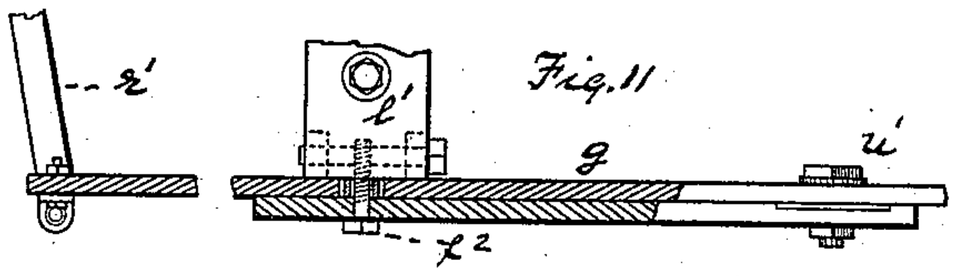
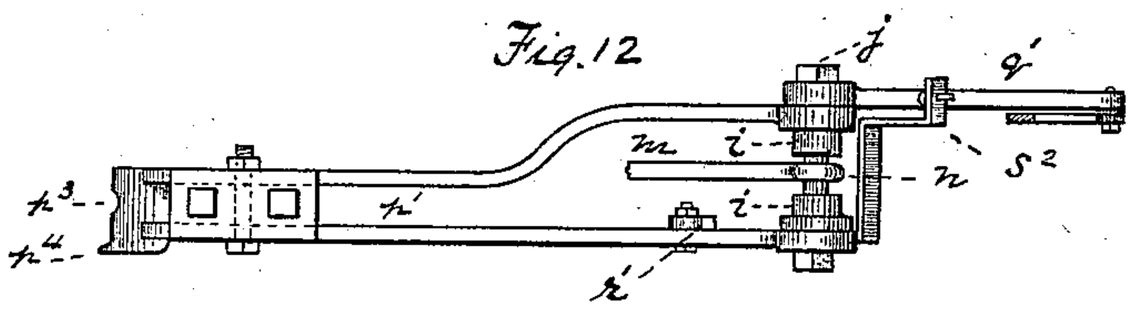


Fig. 12



Witnesses.

J. A Burns.
W. B Corwin

Inventor.

Junius H. Dunbar
by his attorneys
Baxewell & Kerr

UNITED STATES PATENT OFFICE.

JUNIUS H. DUNBAR, OF YOUNGSTOWN, OHIO.

NAIL-PLATE FEEDER.

SPECIFICATION forming part of Letters Patent No. 309,830, dated December 30, 1884.

Application filed January 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, JUNIUS H. DUNBAR, of Youngstown, in the county of Mahoning and State of Ohio, have invented a new and useful Improvement in Nail-Plate Feeders; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an improvement in automatic nail-plate feeders; and it consists in improvements in the operative mechanism and the devices forming an automatic nail-plate feeder invented by me, and described in Letters Patent of the United States No. 287,368, dated October 23, 1883.

I will now describe my invention, so that others skilled in the art to which it appertains may manufacture and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved nail-plate feeder. Fig. 2 is a front elevation of the rotating mechanism. Fig. 3 is a rear elevation of the same partially broken away. Fig. 4 is a plan view of the same partially broken away. Fig. 5 is a detached view of two of the feed-rolls, showing the position of their axes. Fig. 6 is a detached view of the ratchet and lever. Fig. 7 is an end view of the combined bevel and spur wheel. Fig. 8 is an end view of the guide-rolls. Fig. 9 is a perspective view of the guide-finger and a portion of the arm. Fig. 10 is a plan view of the plates which form the auxiliary rocking bar. Fig. 11 is a longitudinal vertical sectional view of the same. Fig. 12 is a plan view of the guide-finger, the pivotal pin, and a portion of the operating arms or levers.

Like letters of reference indicate like parts wherever they occur.

The principal parts of my improvement constituting the nail-plate feeder are a feed-rod mounted on a double oscillating or rocking frame, adjustable levers for imparting reverse oscillating movements to the rocking-frames, a guide-finger and operating-levers, and devices for rotating the feed-rod and for feeding it longitudinally, so as to deliver or feed the plate to the cutter.

In the drawings, *a* represents the bed-frame of the cutter, and *b* the oscillating cutter-head, which is operated by a lever-arm, *c*, one end of which is pivoted eccentrically to the disk *d* on the main shaft *e*.

Pivoted at the forward end of the cutter-frame *a*, below the cutter-head *b*, is the rocking frame *f*, at the outer end of which, and pivoted thereto at a point between its forward end and the middle, is a second or auxiliary horizontal oscillating bar, *g*.

Bolted to the rocking frame *f*, and extending upward therefrom, is a standard, *h*, at the upper end of which are the yoke-arms *i*, (see Fig. 12,) through which a transverse pivotal pin, *j*, passes, so as to form a pivotal connecting-point for the finger-levers.

Journaled in the rear portion of the cutter-frame *a* is the main shaft *e*, keyed to which is the cam or eccentric *k*, which operates the horizontal arm of the bell-crank lever *l*, which lever is pivoted in rear of the shaft *e*, and from the end of the vertical arm of which the connecting-rod *m* extends to the pin *j*, to which it is pivotally connected by the hook or eye *n*. The other end of the rod *m* is adjustably pivoted by a nut and bolt in the slot *o* in the end of the vertical arm of the crank-lever *l*. The cam *k* also operates the vertical oscillating bar *p*, which operates the feed-rod rotating and feeding mechanism by the connecting-rod *q*, one end of which is adjustably pivoted to the upper end of the lever-bar *p* by a bolt passing through the vertical slot *r*, while the other end of the rod *q* is adjustably pivoted in a like manner to the free end of the lever-arm *s*, the other end of which is pivoted to the housing *t* on the end of the oscillating bar *g* by a pin, which also serves as a bearing for the bevel-wheel *a'*. (See Fig. 2.) These rods *m* and *q* are each formed in two pieces, which pieces are adjustably joined by bolts passing through the longitudinal slots *u* and *v*.

Mounted in a suitable housing, *t*, which is bolted to the front end of the rocking bar *g*, is the combined bevel-wheel and spur-wheel *b'*, (see Figs. 2 and 7,) on the edge of which are gear-teeth, the bevel-teeth meshing with the bevel-wheel *a'*, which is operated by the lever *s*, while the gear-teeth mesh into the teeth of the gear-wheels *c' c'*, which are keyed to the feed-rolls *d' e'*. These rolls *d' e'* are journaled by means of pins or bolts *t'* passing through the curved slots u^2 in the housing *t* and *h'*, and se-

cured by nuts v^2, the points of the pins entering holes in the ends of the rolls, so that the axes of the rolls are inclined to each other. (See Figs. 3, 4, and 5.) On the other side of the roll d' is a gear-wheel, f', which meshes into the gear-wheels c' on the roll d', and also into a similar gear-wheel, c^2, on the roll g', which roll is journaled, similarly to the rolls d' and e', to arms on the housing h'. This housing h' is pivoted at its lower end to the housing t, and is also connected therewith by the screw-bolts i'—one at each end—which pass through plain holes in the housing h' into threaded holes in the housing t, and between the head of the bolts and the housing h' around the bolts are spiral springs j'. The purpose of this arrangement is to permit the springing apart of the rolls g' and e', so that the feed-rod may be inserted between the three rolls d', e', and g', the axes of which rolls are inclined to each other, so as not only to rotate the interposed rod on its axis, but also to impart to the rod at the same time a longitudinal movement toward the cutter. The distance between the rolls g' and e' may be regulated by the screw-bolts i^2, which pass through threaded holes in the housing h' and bear against the housing t.

On the outer face of the bevel-wheel a' is a ratchet, w, and on the side of the lever-arm s next to the wheel a' a pawl, k', is pivoted to engage with the ratchet on the forward movement of the lever-arm s.

Near the rear end of the rocking bar g is bolted the housing l', in which are journaled three guide-rolls having their axes inclined to each other, similarly to the rolls d', e', and g', (see Fig. 8,) excepting that they are without the connecting gear-wheels, which are not here necessary, as the purpose of the rolls is merely to afford a support and guide for the feed-rod. The feed-rod m' is provided at one end with nippers n', for holding the nail-plate, and around the rod where it passes through the feed-rolls is a wrapping, g^2, of leather, which enables the rolls to hold the rod firmly while feeding it toward the cutter. To prevent the rod from slipping between the rolls, the surface of the rolls and rod may be suitably corrugated or grooved. As this feed-rod is not provided with a barrel or nose-piece, (these parts not being required,) in order to more effectually control the plate a finger-arm, p', is keyed to the pivotal pin j, and is given a greater movement than that imparted by the rod m by a toggle-lever, q', one end of which is pivoted to the front part of the bed-frame a by the bolt passing through a slot, g^3, while the other end is keyed to the pivotal pin j. The length of the horizontal arm of this toggle-lever may be adjusted by the bolt q^2, passing through a longitudinal slot in the arm of the lever, which arm is formed of two pieces, similarly to the rods m and q.

The purpose of the auxiliary rocking bar g is to give a greater oscillating movement to the feed-rod, which is mounted thereon, and it is operated by a lever-arm, r', pivoted at its lower end to the rear end of the bar g and at its upper end to the finger-arm p'. The length of the lever-arm r' may be adjusted by means of the bolt r^2, passing through a longitudinal slot, the arm being formed in two parts.

In order to allow the lateral position of the feed-rod to be adjusted automatically by the nail-plate coming in contact with the guide z^3, the rocking bar g is formed of two plates placed one on top of the other and pivotally attached by the bolt u', the bolt f^2, which secures the housing l' to the bar, being attached to the lower plate, passes through a curved slot, w', in the upper plate, in which slot is a spiral spring, x^3, and a set-screw, a^3.

The operation is as follows: A nail-plate having been secured in the clamp or nippers on the end of the feed-rod, the feed-rod is placed between the feed-rolls in the housings t and h' and the guide-rolls in the housing l', the plate resting on the cutter-bed. The main shaft e being set in motion, the cutter-head descends and cuts a nail from the plate. At the same time the cam k moves the lower end of the lever-bar p forward, which causes the upper end of the bar to draw back the rod q, the lever-arm s, and the pawl k'. After the nail has been cut, and as the horizontal arm of the bell-crank l passes to the smaller part of the eccentric k, the weight of the rocking frame f, and also the spring a^2, cause the frame to drop, drawing forward with it the rod m, the pin j moving on the line indicated by the arrow. As the arm of the finger p' is keyed to the pin j, the finger is lifted by the forward movement of the standard h, and at the same time the toggle-lever q' turns the pin j on its axis, which gives a further movement to the finger-arm. As the finger-arm p' rises, the rear end of the rocking bar g is also lifted by the connecting-arm r'. By these combined movements after the nail has been cut the guide-finger is removed from the plate and the plate is lifted from the cutter.

Extending between the rods m and q is a spiral spring, b^2, which, when the cam k has passed the lever p, draws the rod q and lever s forward, so that the pawl k' engages with the ratchet w, operates the feed-rolls d', e', and g', and thereby gives the rod m' a half-revolution on its axis, and by the same movement, owing to the inclination of the rolls, feeds the rod forward. At the same time the cutter-head rises as the arm c passes in front of the shaft e. When the cam k again passes under the horizontal arm of the bell-crank lever l, the rod m is drawn back, which lifts the rocking frame f, lowers the rear end of the rocking bar g and the feed-rod m', so as to bring the nail-plate under the cutter-head, it being guided by the guide z^3, and at the same time the finger p' is brought down on the plate. Another nail is then cut, and the plate is again turned and fed forward in the manner described.

Should the nail-plate be attached to the feed-rod crookedly or out of a straight line, it comes in contact with the side of the guide s^3 when it is fed forward, and, owing to the pivotal attachment of the plates forming the bar g, the feed-rod is moved laterally on the pivotal point w' and the nail-plate comes properly under the cutter-head.

Secured to the standard h is a stop, s^2, which prevents the finger-point p^2 from striking the nail-plate with too great force, as when the lever-arm strikes the stop the arm q^2 is pushed forward, being guided by the pin in the slot q^3, the spring q^4 exerting a resisting pressure. This finger-point p^2 is provided with a side guide-point, p^4, which serves to retain the nail-plate more properly in its place, and a curved slot, p^3, which prevents the finger from interfering with the feed-rod when the end thereof is fed close to the cutter.

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

1. In a nail-plate feeder, the combination, with a longitudinally-traveling and axially-rotating feed-rod, of rotating and feeding devices mounted on a double rocking frame, substantially as and for the purposes specified.

2. In a nail-plate feeder, the combination of a set of feed-rolls having their axes inclined to each other, a feed-rod, and a double rocking frame, substantially as and for the purposes specified.

3. In a nail-plate feeder, the combination of a set of feed-rolls having their axes inclined to each other, a feed-rod, a rocking frame, and a set of guide-rolls having their axes inclined to each other, substantially as and for the purpose specified.

4. In a nail-plate feeder, the combination of a feed-rod, a set of feed-rolls having their axes inclined to each other, a pivoted lever, the free end of which is pivotally connected with an adjustable rod extending to and connected with the operating devices arranged in connection with the main shaft, and a pawl, ratchet, and gear-wheels for operating the rolls, substantially as and for the purpose specified.

5. In a nail-plate feeder, the combination of a double rocking frame having a feed-rod mounted thereon, and adjustable operating-lever rods connected with the rocking frames and with the operating devices arranged in connection with the main shaft, substantially as and for the purpose specified.

6. In a nail-plate feeder, the combination of a feed-rod, a double rocking frame, a guide-finger, and the connecting operating mechanism, substantially as and for the purpose specified.

7. In a nail-plate feeder, the combination of a feed-rod, a rocking frame formed of two rods or plates pivotally connected, and guide-rolls mounted on the rocking frame, substantially as and for the purpose specified.

8. In a nail-plate feeder, a guide-finger having a slot in the edge thereof to allow the free movement of the feed-rod, and a projecting point at the side or sides which engages with the edge of the nail-plate, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 30th day of November, A. D. 1883.

JUNIUS H. DUNBAR.

Witnesses:
THOMAS L. JONES,
FRANK JACOBS.