2 Sheets—Sheet 1.

W. KOPLIN.

NAIL-PLATE FEEDER.

No. 189,236. Patented April 3, 1877.

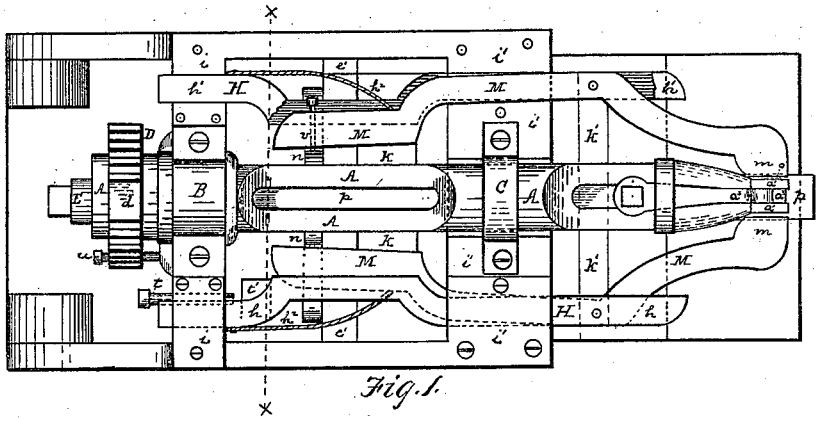

Fig. 1.

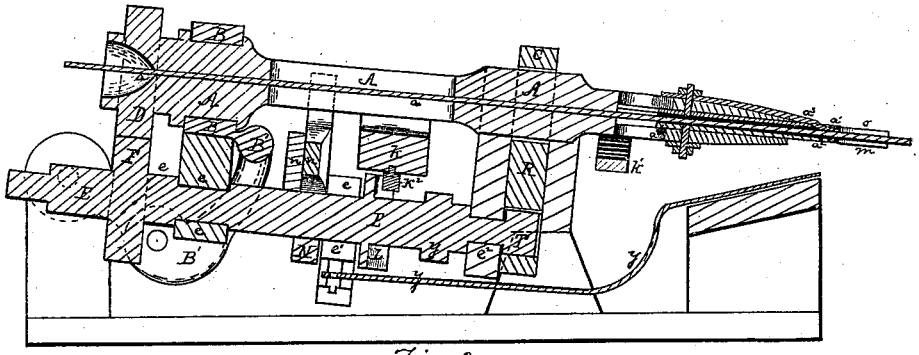

Fig. 2.

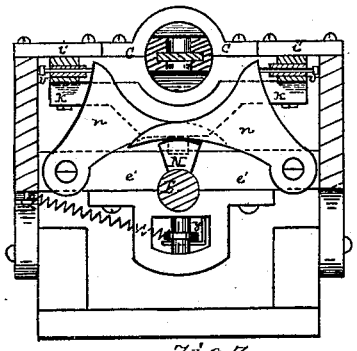

Fig. 3.

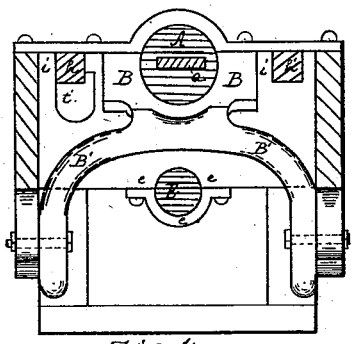

Fig. 4.

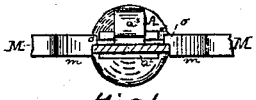

Fig. 6.

WITNESSES.

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2 Sheets—Sheet 2.

W. KOPLIN.

NAIL-PLATE FEEDER.

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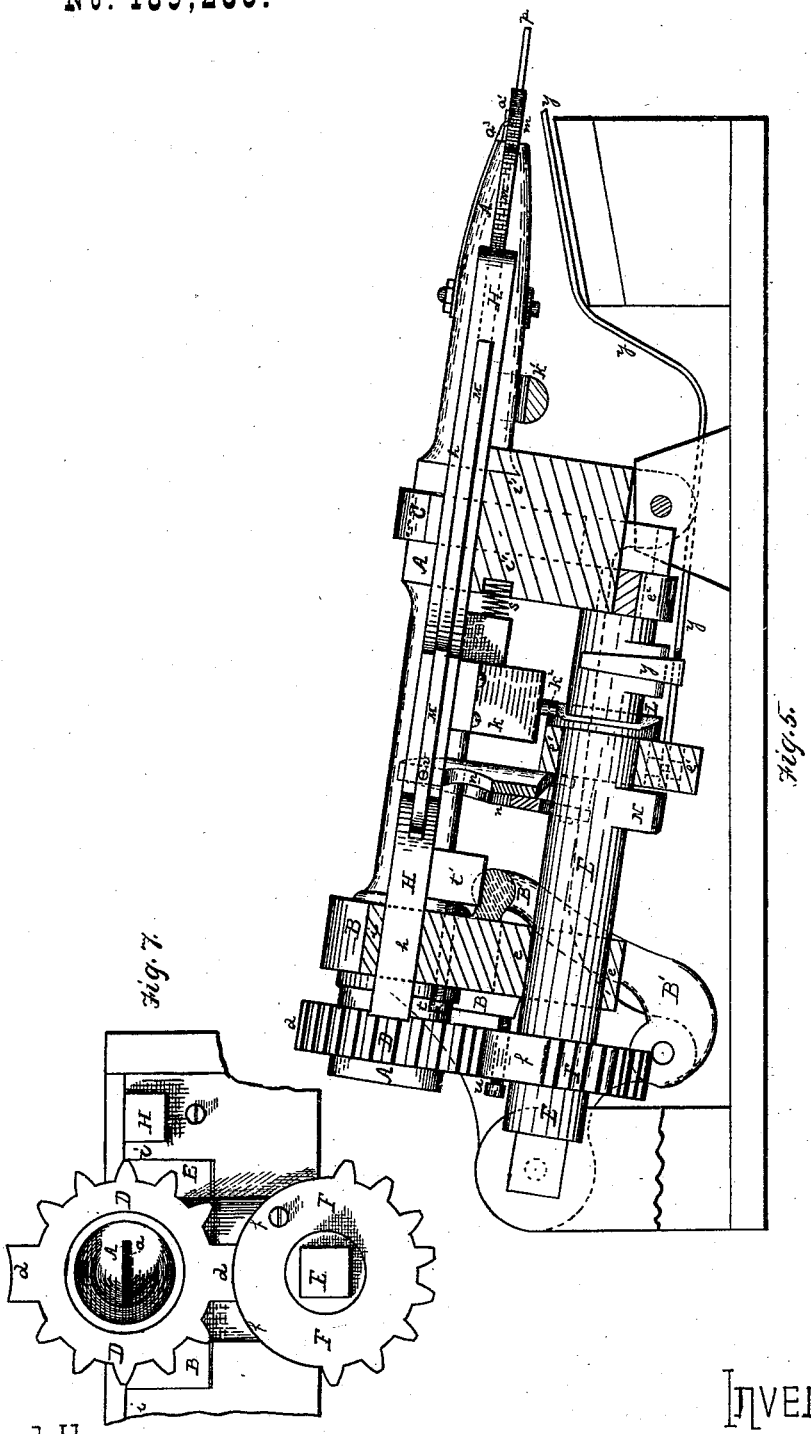

Fig. 5.

Fig. 7.

Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM KOPLIN, OF NEWCASTLE, PA., ASSIGNOR TO HARRY B. KOPLIN, OF SAME PLACE, AND ANTHONY WELSH, OF YOUNGSTOWN, OHIO.

IMPROVEMENT IN NAIL-PLATE FEEDERS.

Specification forming part of Letters Patent No. **189,236**, dated April 3, 1877; application filed December 9, 1876.

To all whom it may concern:

Be it known that I, WILLIAM KOPLIN, of Newcastle, in the county of Lawrence and State of Pennsylvania, 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, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a plan view of a nail-plate feeder embodying my improvements. Fig. 2 is a longitudinal vertical central section of the same. Fig. 3 is a vertical transverse section on the line *x x*, Fig. 1, looking in the direction of the nail-machine. Fig. 4 is a similar section, looking in the opposite direction. Fig. 5 is a side elevation, partly in section. Fig. 6 is a detached front view of the fingers holding a blank; and Fig. 7 is a rear end view of the machine, showing the gearing of the barrel.

Like letters refer to like parts wherever they occur.

My invention relates to machinery for the automatic feeding of nail-plates to nail machinery, and especially to improvements on Letters Patent No. 178,646, granted to me June 13, 1876. It consists, first, in so forming the feed-fingers of the sliding frame that they shall feed forward the nail-plate, and at the same time act as a guard to prevent the plate from rising when a nail-blank is severed from the plate; second, in operating the fingers from the driving-shaft through cam-and-lever mechanism, whereby a positive griping action for the feed is obtained; third, in combining with the feed-fingers, and the mechanism for operating the same, set-screws or equivalent devices, for varying the gripe to suit the width of the blank; fourth, in combining with the spring-nippers of the feeding-barrel a supplemental spring-nipper, whereby the scrap is held independent of the main nippers; fifth, in locking the rear or oscillating bearing of the barrel during the cutting of the blank by means of a set-screw or equivalent device; and, finally, in details of construction hereinafter set forth.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the drawings referred to, A is the feeding-barrel, through the slot *a* of which the nail-plate is fed to the nail-machine. This cylinder or barrel works in the bearings B C, and is revolved by the cog-wheel D working into the cog-wheel F on the driving or cam shaft E. One-half of the cog-wheel F is mutilated, as at *f*, and the cog-wheel D is provided with the blind teeth *d*, by means of which the barrel A is locked during the cutting of the blank. The shaft E, by which power is applied to the machine, is journaled in the bearings e e^1 e^2, and carries the cams which operate the different parts of the machine. In the bearings i i' I arrange the sliding frame H, having the longitudinal arms h h^1 connected by the cross-braces k k^1. From the cross-brace k the cam-pin k^2 (which may be provided with an anti-friction roll) extends down so as to be operated upon by the cam L, which is rigidly attached to the cam-shaft E, and operated thereby. The form of the cam L is such that it will advance the frame H once during each revolution of the cam-shaft. Working against the bearing i' I place one or more springs, *s*, which press against lugs on the frame H, keep the cam-pin k^2 in contact with the cam L, and retract the frame upon the recession of the projection of the said cam.

Pivoted in the frame H are the feeding-levers M, provided with the feeding fingers or clutches *m*, which bite upon the nail-plate *p* at the mouth of the barrel A. Rigidly attached to the shaft E is the cam N, operating the cam-levers *n n*, which press upon the pivoted levers M, and cause the fingers *m* to close and bite upon the plate *p* during the advance of the sliding frame and the cutting of the blank. When the plate has been fed forward, and the projection on the cam N passes the levers *n n*, the springs h^2 retract the pivoted arms M, and free the feeding-fingers from the plate.

The fingers *m* are recessed or flanged, as shown at *o*, to form guard-flanges, which take over the nail-plate, support it during the cut-

ting, and prevent the flying of scrap when the last cut is made from a plate.

The forward bearing C of the barrel A is formed upon a vertically-sliding yoke, R, which is held up by a spring or equivalent device, and retracted by a cam, T, on the power-shaft E, (as is described in my former patent above referred to.) To the frame of the machine, and below the axial line of the cam-shaft E, are pivoted the arms B′, which extend up and carry the rear bearing B of the barrel A.

By so pivoting the bearing B I obtain a longitudinal oscillatory or rocking motion of the barrel A, so that when the forward bearing C is raised by the spring, the rear bearing B, being pivoted, as specified, allows the barrel to be retracted. As it is desirable that the barrel A shall remain stationary during the cutting of the blank, and that the bearing B shall not vibrate at that time, I place the set-screw *u* in the wheel F in such position that during the time the part *d* of the wheel D is resting on the mutilated portion *f* of the wheel F, the screw *u*, or equivalent projection, shall press against the bearing B and prevent its movement. The equivalent of this set-screw, as far as locking the oscillating bearing is concerned, would be a cam projection on the wheel F; but it will be observed that the set-screw is preferable, as it can also be used to take up any lost motion by the wearing of the parts.

Passing through the rear bearing *i* is the set-screw *t*, which works against a lug, *t′*, on the sliding frame H, and regulates its throw or travel. Passing through each of the pivoted finger-levers M, at the points where the cam-levers come in contact therewith, are set-screws *v v*, by means of which the "gripe" of the feeding-fingers upon the nail-plate may be varied to suit different widths of plate.

The cylinder or barrel A is provided with spring-nippers a^1 a^2, of steel or any suitable material, which hold the nail-plate and present it to the machine in the required position for cutting. As the nail-plates are not all of the same thickness, it is evident that if a thick plate is fed after a thin one, the nippers would be so distended that they would not hold the thin one. To overcome this difficulty I have combined with the regular nippers a supplemental nipper, a^3, which passes over the nipper a^1, and bites upon the plate at the mouth of the nipper, and holds it against the other nipper, a^2, until the last cut is made.

The operation of my improved machine is as follows: The nail-plate is fed through the slot *a* until it is caught by the nippers a^1 a^2 and feeding-fingers *m* at the mouth of the barrel, one of the blind teeth *d* of the cog-wheel D resting upon the mutilated portion *f* of the wheel F, and holding the barrel in position for cutting. Upon the revolution of the power-shaft, the cam L advances the sliding frame H, and, at the same time, the cam N, raising the cam-levers *n n*, by pressure upon the pivoted levers M, causes the feeding-fingers *m* to gripe the nail-plate *p*, and, by the advance of the sliding frame H, feed it forward sufficiently for the cutting of a nail-blank. The eccentricity of the cam L, having now passed the cam-pin k^2, permits the springs *s* to retract the frame H until the lug *t′* comes in contact with the set-screw *t*. After the feed has been made, the cam N passes the levers *n n*, and permits the springs h^2 to free the fingers *m* from the plate, when they are carried back by the frame H, in the manner above described.

Upon the further revolution of the shaft E, the gear-wheels D and F mesh into each other, and the barrel A is revolved in the bearings B and C. At the same time the cam F allows the springs to raise the forward bearing C, and with it the barrel A, and the rear bearing B, being pivoted, as above described, allows the raising of the bearing C, to retract or rock back the barrel A, and thus impart to the forward end of the barrel a backward and rising motion, allowing it to free itself from the cutter and make a half-turn before another nail is cut from the plate. The barrel is then drawn down by the cam T, and, by the lowering of the bearing C, the bearing B is advanced to the position before occupied, and the operation is continued, as before described. In order that the bearing B shall not be retracted or vibrate during the time the feeding-barrel is stationary, I place the set-screw *u*, or equivalent device, on the wheel F, in such position as to lock or hold the bearing stationary during the cutting of the blank.

It is sometimes desired to change the machine, so as to feed a plate for making different-sized nails. To accomplish this I place the set-screws *v v*, or equivalent devices, upon the pivoted arms M, by means of which the fingers *m* are caused to approach nearer each other, to suit the width of plate to be fed; and I regulate the feed or travel of the frame H by means of the set-screw *t*, working against the lug t^1, so as to suit the width of the cut to the size of nail desired. By means of this set-screw *t*, any lost motion caused by the wear of the cam L or cam-pin k^2 may be taken up.

The feeding-fingers *m* bite upon the nail-plate during the cutting of the nail-blank, the guard-flanges *o* supporting the plate and preventing it from rising. When the last cuts are made from the plate, the supplemental nipper a^3 holds the plate steady, and, in connection with the fingers *m* and flanges *o*, presents it in the proper position to the nail-machine.

The machine is provided with the scrap-clearer *y*, described and claimed in my former patent, above referred to.

Some of the advantages of my improved nail-plate feeder are:

First, by means of the guard-flanges and

supplemental nipper, I obtain a simple and surer method of holding the blank.

Second, by means of the cam-and-lever mechanism, I secure a positive action for the feed.

Third, by means of the set-screws for changing the bite of the fingers and throw of the sliding frame, the feeder may be regulated to suit different-sized nails, which has not been accomplished before.

Fourth, by pivoting one of the bearings of the barrel, the operation of the feed is simplified, and consequently the wearing of the different parts is obviated.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a nail-plate feeder, the combination of the feeding-barrel, the sliding frame, and the feed-fingers, provided with the guard-flanges, substantially as and for the purposes specified.

2. In a nail-plate feeder, the combination of the feed-fingers, pivoted in the sliding frame, and the lever-and-cam mechanism for operating the fingers, substantially as and for the purposes specified.

3. In a nail-plate feeder, the combination of the feed-fingers with mechanism for operating the same, and the set-screws on the feed-fingers, substantially as and for the purpose specified.

4. In combination with the sliding-finger frame of a nail-plate feeder, the set-screw for regulating the travel of the frame, the feed-fingers, and the set-screws thereon, substantially as and for the purpose specified.

5. The feed-barrel provided with the spring-nippers, and the supplemental spring working through a slot in one of said nippers for controlling the scrap, substantially as and for the purpose specified.

6. In combination with the feed-barrel, the vertical rising and falling bearing C, yoke R, and the oscillating or rocking bearing B B′, substantially as and for the purpose specified.

7. In combination with the rocking bearing, the projection for locking the bearing, substantially as described.

In testimony whereof I, the said WILLIAM KOPLIN, have hereunto set my hand.

WILLIAM KOPLIN.

Witnesses:
F. W. RITTER, Jr.,
JAMES I. KAY.