W. KOPLIN.

NAIL-PLATE FEEDER.

No. 178,646. Patented June 13, 1876.

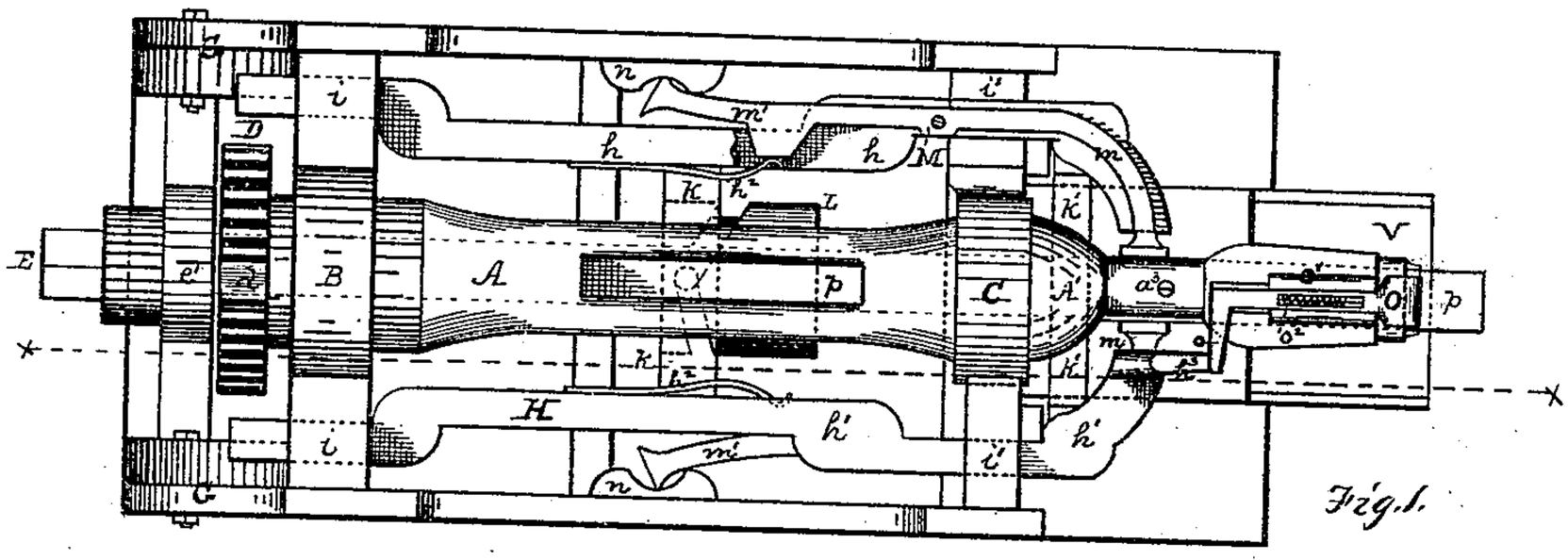

Fig. 1.

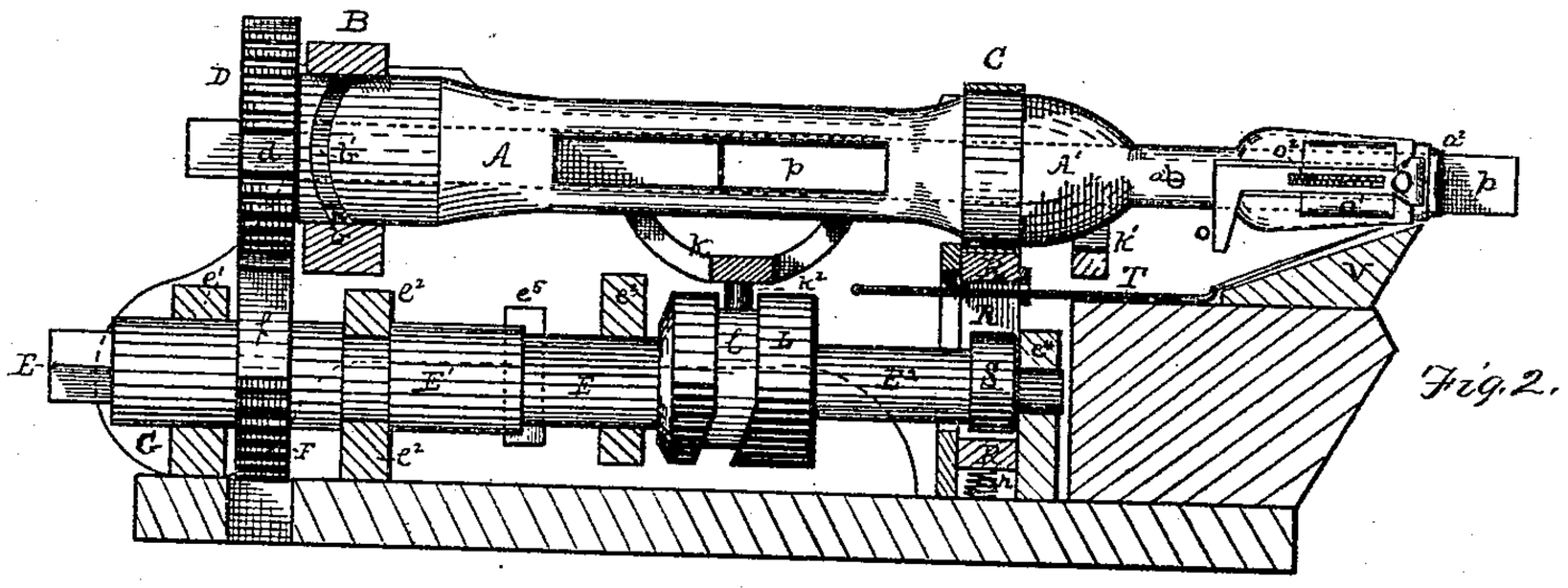

Fig. 2.

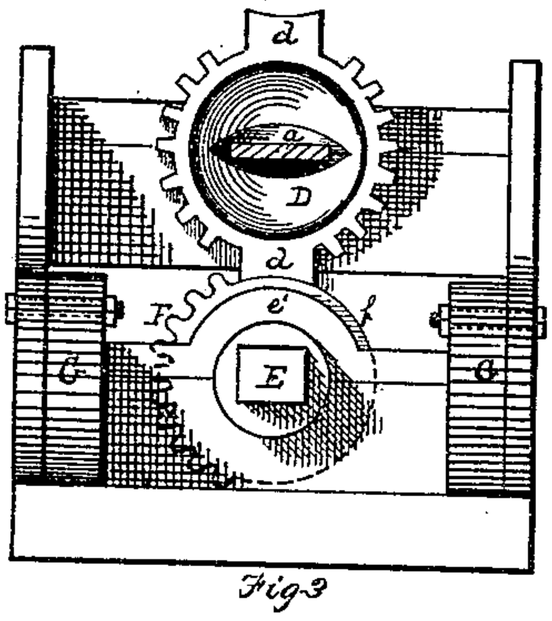

Fig. 3

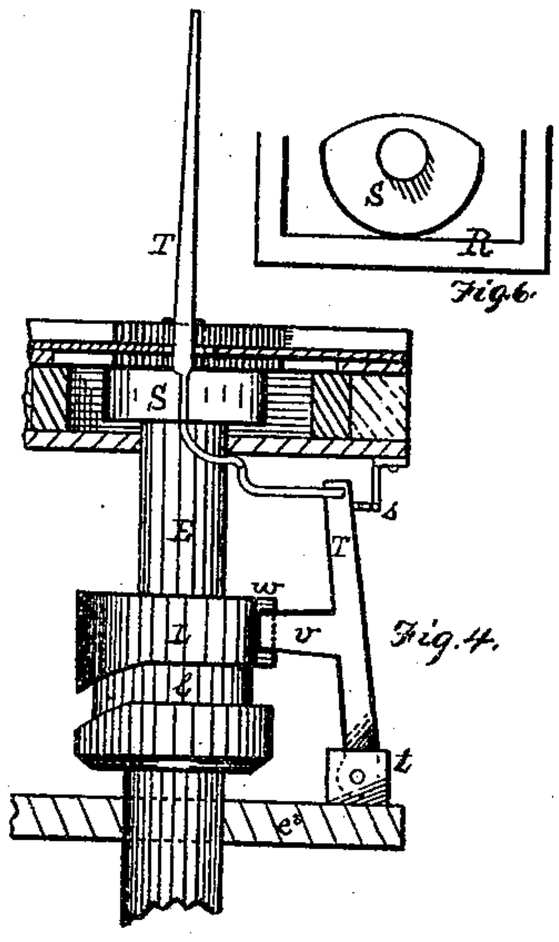

Fig. 4.

Fig. 6.

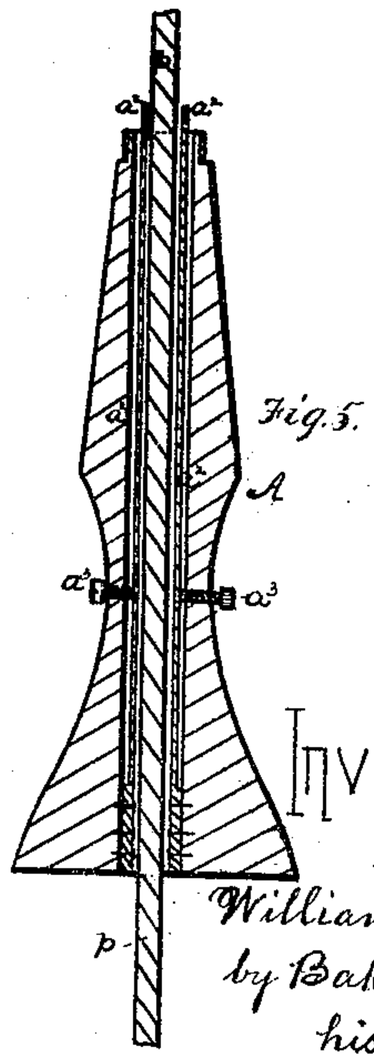

Fig. 5.

Witnesses.

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UNITED STATES PATENT OFFICE

WILLIAM KOPLIN, OF NEWCASTLE, PENNSYLVANIA, ASSIGNOR TO HARRY B. KOPLIN, OF SAME PLACE, AND NATHANIEL E. BROWN, OF YOUNGSTOWN, OHIO.

IMPROVEMENT IN NAIL-PLATE FEEDERS.

Specification forming part of Letters Patent No. **178,646**, dated June 13, 1876; application filed March 2, 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-Feeding Machine; 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 my improved nail-plate-feeding machine. Fig. 2 is a longitudinal section through the line *x x*, Fig. 1. Fig. 3 is an end view, showing the gearing employed to operate the feed-barrel. Fig. 4 is a plan view of the scrap-clearer, showing the manner of operating the same. Fig. 5 is a detached sectional view of the forward part of the feed-barrel, and Fig. 6 is a view of the cam for operating the cam-yoke.

Like letters of reference indicate like parts in each.

My invention relates to machines for the antomatic feeding of nail-plates to nail-machines; and it consists, first, in the combination of the feeding-barrel and sliding guards, which are caused to advance to prevent the rising of the scrap during the cutting of the last nail from the plate; second, in the combination of the feed-barrel, sliding frame, and fingers, the cam-shaft for operating the frame, and suitable mechanism for causing the movement of the frame to operate the fingers; third, in the combination of the feed-barrel, cam-yoke, and spring for raising and lowering the same and presenting it to the cutter; fourth, in the combination of the feed-barrel and clearer, and suitable mechanism for operating the same, whereby the refuse of plate or scrap escaping from the feed-tube is cleared from the cutter; fifth, in the combination of the feeding-barrel, the sliding guards, and sliding frame, or equivalent mechanism, for operating the sliding guards from a point off the feeding-barrel; sixth, in the combination, with the revolving feed-barrel and mutilated pinion for driving the same, of a pinion provided with blind-teeth, and combined with or arranged in relation to the barrel, so as to lock the barrel on each half-revolution, or during the time the plate is presented to the cutter; and, finally, in details of construction hereinafter specified.

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

In the drawing referred to, A is the revolving feed barrel or cylinder, through which the nail-plates are fed to the nail-machine. Through the center of this cylinder A is the longitudinal slot *a*. This cylinder A works in the bearings B C, and is revolved therein by means of the cog-wheel D, upon which are the blind teeth *d*. Below the cylinder A I arrange the cam-shaft E, to which power is applied in any suitable way, and to which is rigidly attached the cog-wheel F, gearing into the wheel D. The cogs on one-half of the wheel F are mutilated, as at *f*.

The cylinder A will be revolved at such times as the gearing on the wheels D and F mesh, and will remain stationary when the blind gearing on the wheel D rests upon the mutilated portion of the wheel F, (as shown in Fig. 3,) the cam-shaft E thus making one complete revolution to every half-revolution of the cylinder A, and the cylinder being locked at the close of each half-revolution or during the time that the blind teeth of the gear-wheel D are in contact with the mutilated portion *f* of the driving-pinion F, thus insuring the steadiness of the plate during the operation of the cutter.

The cam-shaft E is composed of two parts, tongued and grooved, or keyed so as to separate when the machine is thrown back on the hinges G, and joined again by means of the tongue-and-groove joint e^5. The part E^1 of the cam-shaft E works in the bearings e^1 e^2, and the part E^2 in the bearings e^3 and e^4, one set of bearings being fast on the bed and the other carried on the pivoted frame. In the bearings *i i* I arrange the sliding frame H, having the longitudinal arms *h h'* connected by the cross-braces *k* k^1. From the cross-brace *k* is the projection k^2 extending into the groove *l* in the groove-cam L. This groove-cam L is rigidly attached to the cam-shaft E and operat-

ed thereby. The groove *l* in said cam is so arranged that upon each revolution of the cam-shaft the sliding frame H is advanced and retracted. Pivoted in the longitudinal arms *h h*^{1} are the feeding-levers M, provided with the fingers or clutches *m*, shod with any suitable substance for biting on the nail-plate and feeding it forward. Arranged upon the sides of the machine are a series of inclines, *n*, against which the arms *m*^{1} of the feeding-levers *m* are pressed by means of the springs *h*^{2}, causing them to follow the continuity of the incline, thereby obtaining an alternate advance and recession of the finger-arms of the levers. When the sliding frame H advances, the arms *m'*, following the inclination of the inclines *n*, throw the fingers *m* against the nail-plate *p*, causing them to seize the same and hold it during the forward motion of the sliding frame, thus feeding forward the plate, and then the arms *m'*, being retracted by the inclines *n*, free the fingers *m* from the plate *p*. Upon the arm *h*^{1} of the frame H is the projection *h*^{3}, which engages with the arm *o* of the sliding guards O. These sliding guards O move in the bearings *o*^{1} and are retracted by the springs *o*^{2} when the arms *o* are freed from the projection *h*^{3}. These guards O advance over the nippers *a*^{2} whenever a cut is made from the plate, to support the plate, and also to prevent the flying of the scrap or piece left after the last cut is made from the plate. In the barrel A are the spring-nippers *a*^{2}, of steel or other suitable material, which hold the nail-plate *p* in the required position for cutting by the nail-machine.

The tension of the nippers *a*^{2} may be varied by means of the set-screws *a*^{3}, and thus their hold on the nail-plate changed to suit the feed. This is clearly shown in Fig. 5.

The forward bearing C of the barrel A is formed upon a vertically-sliding yoke, R, which is held up by a spring, *r*, or equivalent device, and retracted at intervals by a cam, S, on the shaft E. In the rear bearing B of the barrel is a fixed pin or projection, *b*, which works in a cam-groove, *b*^{1}, in the barrel A, and by means of which the barrel is advanced and retracted. Pivoted at *t* is the clearer T, for clearing the refuse plate or scrap from the cutter of the nail-machine. This scrap-clearer T extends just below the nippers *a*^{2} of the feeding-cylinder, and between it and the bed-knife V of the nail-machine. Upon the clearer T is a lug or projection, *v*, which is pressed into the notch *w* in the cam L by means of the spring *s*, thus vibrating the scrap-clearer T.

If preferred, the scrap-clearer may be operated by an independent cam on cam-shaft, E.

The operation of my improved nail-plate-feeding machine is as follows: The nail-plate is fed through the longitudinal slot *a* of the feeding-barrel A until it is opposite the fingers *m*. The blind teeth *d* of the gear-wheel D rest upon the mutilated portion *f* of the wheel F, so that the barrel A will not be turned by the revolution of the shaft E, but will be locked by the contact of the blind teeth with the mutilated portion of the gear-wheel for an interval during which the cutter is in operation. Power is applied to the cam-shaft E, which turns the groove-cam L, thus advancing the sliding frame H, and, by means of the stationary inclines *n*, causing the fingers *m* of the levers M to seize the nail-plate *p* and hold it during the forward motion of the frame H, thus feeding forward the nail-plate the proper distance for the cutting of a nail-blank by the machine. The arms *m'* of the levers M being now retracted by the inclines *n*, free the fingers *m* from the plate *p*. Upon the further advance of the frame H the projection *h*^{3} engages with the sliding guard O, above the spring-nippers *a*^{2}, and causes it to advance over the nippers *a*^{2}, to support the plate, and also to prevent the flying of the scrap when the last cut is made from the plate.

During the operation thus described the forward bearing C of the barrel A has been held down by the cam S, so that the nippers *a*^{2} are in position for the cutting of the nail-blank. The cut is now made by the cutters of the machine.

Upon the further revolution of the shaft E the gearing on the wheels D and F mesh into each other, and the barrel A is revolved in the bearings B and C, the barrel being retracted by the cam-groove *b'* and pin *b* in the bearing B. At the same time the cam S allows the spring *r* to raise the sliding yoke R and bearing C. By these means a backward and a rising motion are imparted to the forward end A' of the feeding-barrel, allowing it to free itself of the cutter, and make a half turn before another nail is cut from the plate. The barrel is again drawn down by the cam S, and advanced by the cam-groove *b'* and pin *b*, and the operation is continued as before. During the turning of the barrel the scrap-clearer T is vibrated above the bed-knife V of the nail-machine in the manner above described, clearing away any pieces of scrap which may have fallen from the nippers *a*^{2} of the machine, and, returning, assumes its position out of the way of the side of the bed-knife until another cut is made. Spy-holes in the barrel will enable the operator to see when it is necessary to feed in more plate.

I have found in operating a full-sized machine, constructed in accordance with the above specification, that a speed requisite to cut two hundred nails per minute is easily obtained, and the devices work regularly and effectively.

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

1. In combination with the feeding-barrel of a nail-plate feeder, the automatic spring-nippers *a*^{2} and the adjusting-screws *a*^{3}, substantially as described.

2. The combination of the revolving feeding-barrel with the sliding guards O movable thereon, and suitable mechanism for actuat-

ing the guards, substantially as and for the purposes specified.

3. The combination of the feed-barrel, the sliding frame, provided with pivoted fingers, the cams or inclines for actuating the fingers, and suitable mechanism for reciprocating the sliding frame, substantially as and for the purposes specified.

4. In combination with the feed-barrel A, the vertically-sliding forward bearing C, and cam and yoke mechanism R S *r* for raising and lowering the same during the revolution of the barrel.

5. In combination with the feed-barrel, a clearer adapted to work in advance of the barrel and across the bed-knife, and suitable mechanism for operating the clearer, substantially as and for the purposes set forth.

6 The combination of the revolving feed-barrel, the pinion attached thereto, and provided with blind teeth, and the mutilated pinion of the driving-shaft, substantially as and for the purposes specified.

7. The combination of the feeding-barrel, provided with vertically-movable bearing, the feeding-fingers, provided with a sliding frame, the sliding guard, the clearer adapted to work in advance of the feed-barrel and across the bed-knife, and suitable cam mechanism for actuating the several parts specified, substantially as and for the purposes set forth.

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

WILLIAM KOPLIN.

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