E. B. Lake.

Nail-Plate Feeder.

No. 71521 Patented Nov. 26, 1867

Fig. 1.

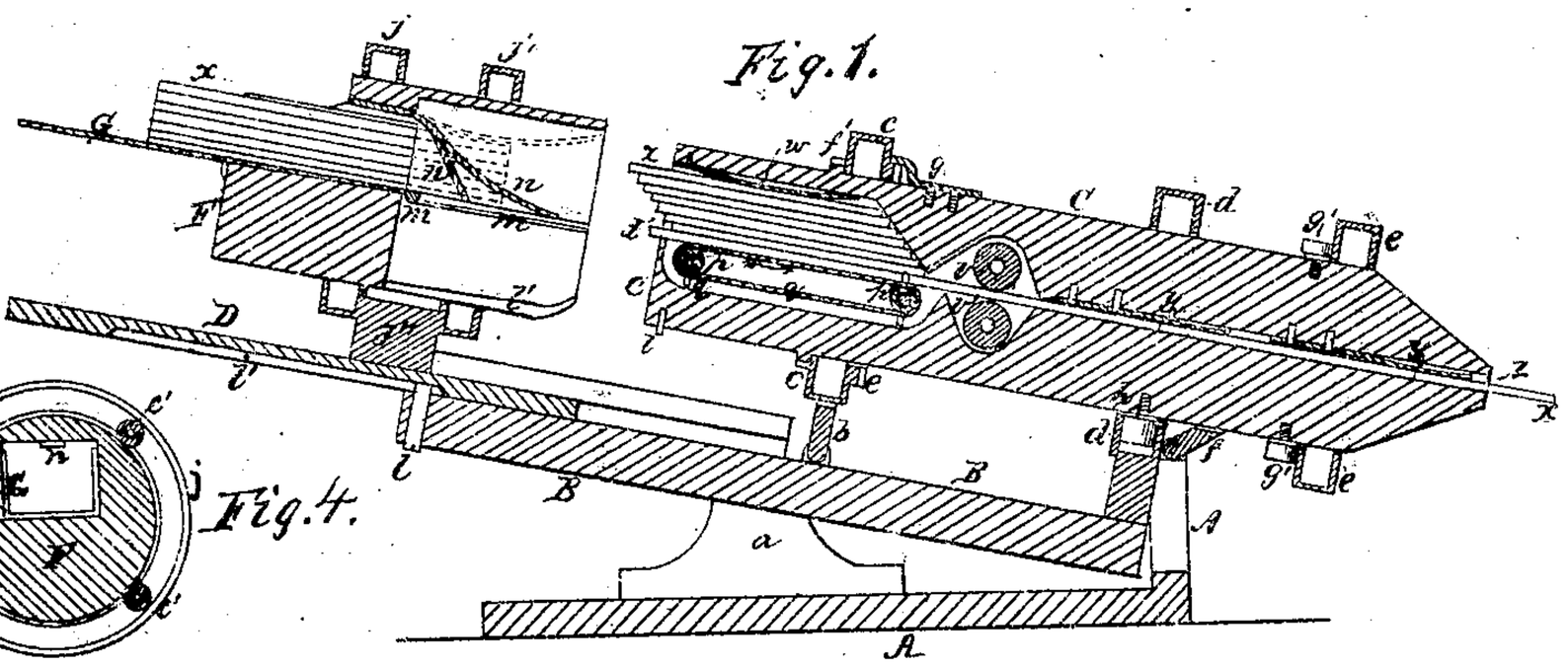


Fig. 4.

Fig 2

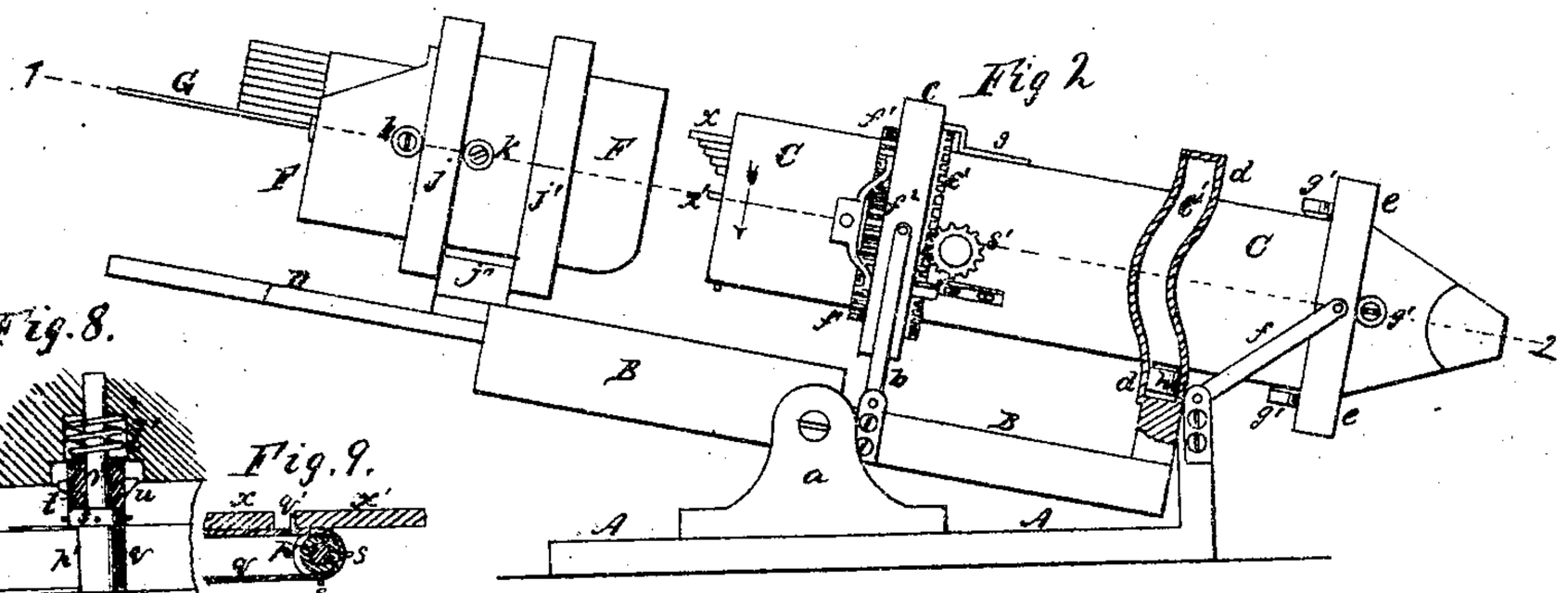


Fig. 8.

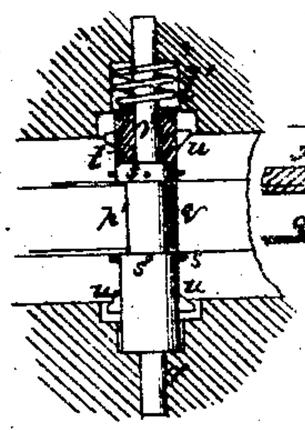


Fig. 9.

Fig. 3.

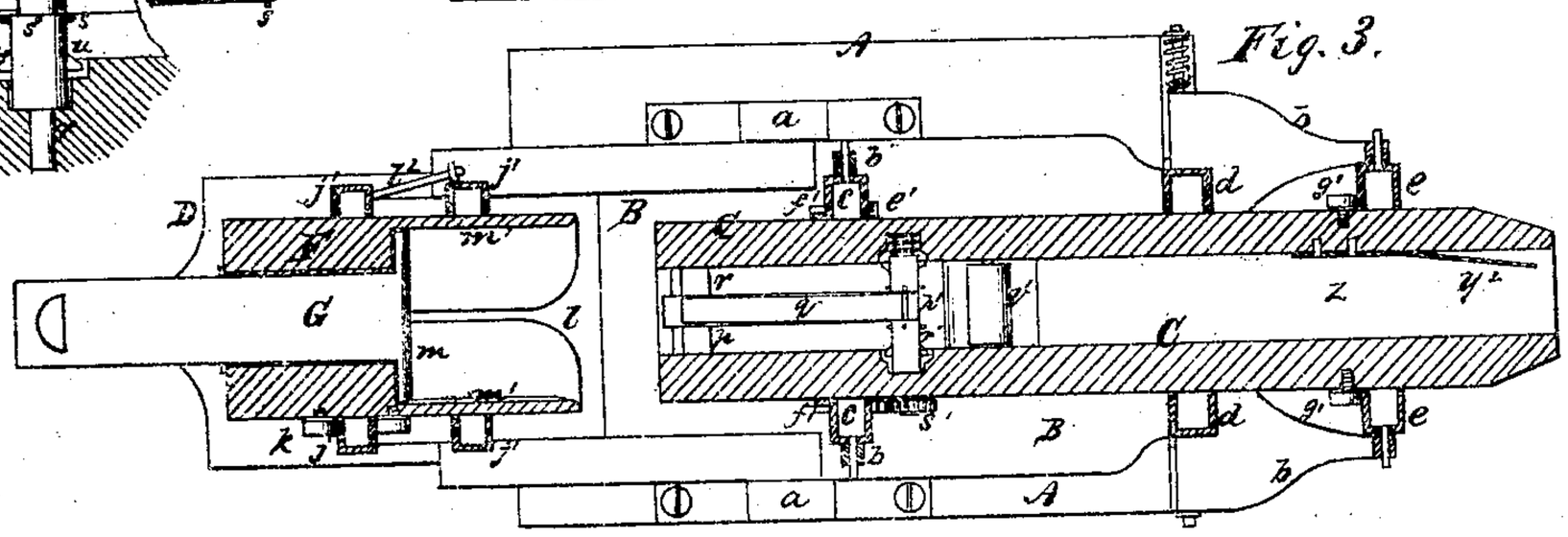


Fig. 5.

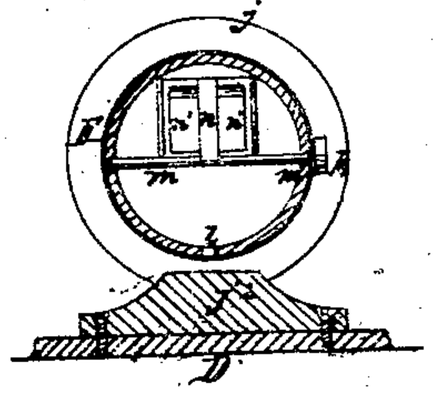


Fig. 6.

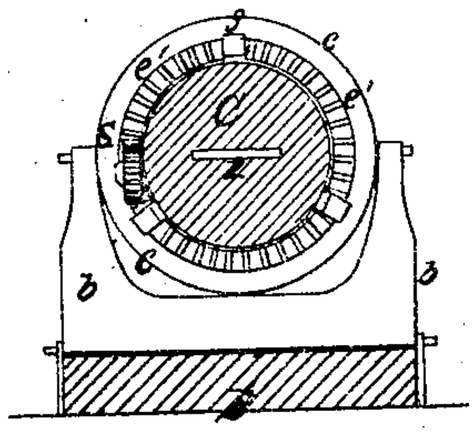
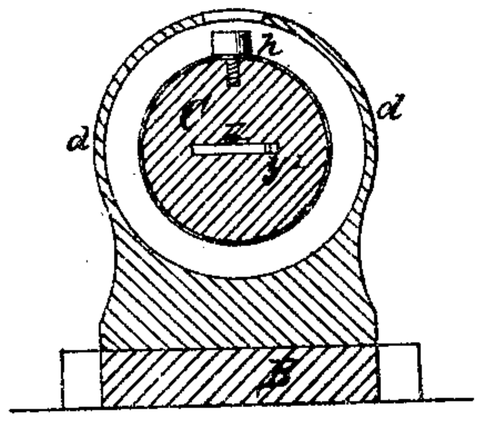


Fig. 7.



Witnesses.

H. Overbaugh

John Parker

Inventor.

E. B. Lake

By Bro. & Co.

H. Overbaugh

United States Patent Office.

EZRA B. LAKE, OF BRIDGEPORT, NEW JERSEY.

Letters Patent No. 71,521, *dated November* 26, 1867.

IMPROVED NAIL-PLATE FEEDER.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, EZRA B. LAKE, of Bridgeport, Gloucester county, New Jersey, have invented an Improved Nail-Plate Feeding-Machine; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists of certain mechanism fully described hereafter, whereby nail-plates placed in a suitable receptacle, are continuously and regularly fed to a nail-machine.

In order to enable others familiar with machinery of this class to make and use my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a sectional elevation of my improved nail-plate feeding-machine.

Figure 2, an outside view of the same.

Figure 3 a sectional plan view on the line 1–2, fig. 2.

Figures 4, 5, 6, and 7, transverse sectional views at different points in the machine; and

Figures 8 and 9 detached sectional views drawn to an enlarged scale.

Similar letters refer to similar parts throughout the several views.

To the bed-plate A of the machine are secured standards *a a*, which form bearings for a vibrating plate, B, and to the latter is hung a swinging frame, *b*. A hollow metal ring, *c*, is arranged to turn freely on the swinging frame *b*, and a cam-like ring, *d*, is secured to the front end of the vibrating plate B. (See figs. 2, 6, and 7.) A cylindrical casing or barrel, C, passes through and turns in these rings, and in a third ring, *e*, which is hung to a swinging frame, *f*, hinged to the bed-plate of the machine; and within each of the rings *c* and *e* are hung four or more anti-friction pulleys, *c'*, fig. 4, which bear against the barrel C, and enable it to turn freely in the said rings.

To one side of the ring *c* is secured a circular rack, *e'*, for a purpose described hereafter, and at the opposite side of the ring, and secured to the barrel C, is a cog-wheel, *f'*, gearing into a driving-pinion, *f''*, which is secured to the ring, and by means of which motion is communicated to the barrel. The latter turns loosely in the ring *c*, and is prevented from slipping through the same on one side by its cog-wheel *f'*, and on the opposite side by lugs *g*, fig. 2, which bear against the ring. The barrel is prevented in like manner from slipping through the ring *e*, by anti-friction pulleys *g'*, secured to it on each side of the ring, fig. 2, and a pulley, *h*, is hung to the barrel within the hollow cam-like ring *d*, for a purpose described hereafter.

A frame, D, is arranged to slide in guides secured to the vibrating plate B, and is retained in its position by a pin, *i*, which enters a groove, *i'*, of the frame, and by a spring, *i''*, figs. 1 and 3. Two hollow rings, *j* and *j'*, similar to the rings *c* and *e*, are secured to a projection, *j''*, of the sliding plate D, and are also provided with anti-friction pulleys *c'*; and a hollow metal casing, F, is arranged to turn in the said rings, but is prevented from slipping through them by pulleys *k*, figs. 1 and 2. The casing F is of greater diameter than, and is arranged to slip over the rear end of, the barrel C, a pin, *l*, of the latter entering a slot, *l'*, of the casing, fig. 1. A square box, G, open at the top, slides in a square opening at the rear of the casing F, and is guided and held in its place by a transverse rod, *m*, fig. 3, which enters grooves *m'* on the opposite sides of the casing. A flat spring, *n*, is secured to the casing F, immediately over the box G, and has hinged to it a flap, *n'*, for a purpose described hereafter. (See fig. 1.)

In the rear end of the barrel C there is a square opening, in line with the box G of the casing F, and directly beneath this opening are two spindles, *r* and *r'*, having pulleys *p* and *p'* connected together by an endless band, *q*, on which are projections *q'*. Each spindle, *r* and *r'*, has projections *s* on each side of its pulley, (figs. 8 and 9,) and the latter spindle, *r'*, projects through one side of the barrel, and is provided with a pinion, *s'*, gearing into the circular rack *e'* of the ring *c*. On the spindle *r'* there is a sleeve, *t*, fig. 8, against which bears a spiral spring, *t'*, and both the spindle and its sleeve have lugs *u*, for a purpose described hereafter.

Two feed-rollers, *v* and *v'*, turn within the barrel, and a spring, *w*, is secured to the latter, directly above the endless band *q*, while similar springs, *y*, y^1, and y^2, are secured to the top and one side of a narrow opening or passage, *z*, which extends through the barrel. (See figs. 1 and 3.)

Operation.

Power is applied to the driving-pinion f^2, and is transmitted by the cog-wheel f' to the barrel C, which revolves in the direction of its arrow, fig. 2. The cam-ring *d*, as before described, is stationary, and as the pulley *h*, hung to the barrel, is contained within this ring, it must necessarily follow the curves of the same as it is turned, so that an alternating longitudinal motion will be imparted to the barrel as it revolves. At the same time, as the barrel is prevented from slipping through the rings *c* and *e*, the latter must follow its longitudinal movements, and consequently turn the swinging frames *b* and *f* upon their centres. The latter frame, *f*, is hung to the bed-plate, and as it is thus turned the plate B will be caused to vibrate, and the outer end of the barrel C to rise or fall, according to the position of the pulley *h* within the cam-ring *d*.

The box G of the casing F, which has been previously moved back from the barrel, is now filled with the thin iron plates from which nails are to be made, and which are represented by red lines, *x*, fig. 1. This box and its plates are first moved forward by the attendant, elevating the spring *n* and its flap *n'*, as shown by dotted lines, fig. 1, and the motion is continued until the plates are sufficiently advanced to allow the flap *n'* to fall behind them. The sliding frame D and casing F are then moved towards the revolving barrel C, the pin *l* of the latter entering the slot *l'* of the casing F, and causing it to revolve with the barrel, and as the casing is thus revolved, the plates *x* are prevented from falling out of the box G by the spring *n*, which bears upon them. The casing is pushed forward over the end of the barrel C, and the flap *n'* bears against the rear ends of the nail-plates, and causes them to follow the casing, and enter the square opening of the barrel above the band *q*; but the rod *m* of the box G bears against the rear end of the barrel, and causes the box to slide back to its first position in the casing.

The band *q* turns in the direction of its arrow, and the plates are drawn to the position in the barrel, shown in fig. 1, by the projections *s* of the pulley *p*. When in this position the spring *w* bears upon the plates, and holds them down to the band *q*, and the casing F may be drawn back from the rear of the barrel. The plates are now contained within the barrel, the bottom plate *x'* resting on the moving band *q*, and one of the projections *q'* of the latter strikes the rear end of the bottom plate *x'*, and pushes it forward between the feed-rollers *v* and *v'*, and into the narrow opening *z* of the barrel. As soon as this plate is pushed off the band, another falls or is pressed into its place by the spring *w*, figs. 1 and 9, and follows the first plate through the barrel, and this is continued until one of the plates projects from the front end of the same, as shown in fig. 1, the springs *y*, y^1, and y^2 pressing against the plates, and holding them in a proper position.

In feeding nail-plates, it is necessary, in order to prevent waste of metal, to present opposite flat sides of the plate alternately to the action of the shears of the nail-machine; and as the plate rests upon a table while being cut, it must be raised in order to be turned, and at the same time drawn back a short distance, so as to clear the shears. This is done in my machine by the cam-ring *d*, which, as before described, draws the barrel back, and at the same time, with the aid of the swinging frames *b* and *f*, raises or lowers the front end of the barrel while it is being turned, and the plates fed from the same.

The plate *x'* projecting from the front end of the barrel, is fed to the nail-machine, and when it is cut up is followed by a second, and so on until the supply contained in the barrel is exhausted, the plates being uniformly fed forward and presented to the action of the nail-machine with regularity and precision. Before all the plates contained in the barrel have been used, the box G of the casing F is again filled by the attendant, as shown in fig. 1, so that the barrel may be replenished without loss of time. It is desirable that the plates, in passing through the barrel, should be maintained in a central position. To effect this object they are caused to pass between the lugs *u* of the spindle *r'* and its sleeve *t*, and if the plates vary slightly in width, the sleeve *t*, acted on by the spring *t'*, adjusts itself accordingly.

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

1. The barrel C, constructed substantially as described, in combination with the devices herein described, or their equivalents, for imparting to the said barrel a combined rotary, longitudinal, and vibratory motion, for the purpose specified.

2. The above, in combination with the vibrating plate B, swinging frames *b* and *f*, and rings *c* and *e*, for vibrating the barrel C, as described.

3. The casing F, constructed substantially as described, turning in the hinges *j* and *j'*, and arranged on plate D, to slide on the vibrating plate B, in the manner and for the purpose specified.

4. The casing F, combined and operating in conjunction with barrel C, as specified.

5. The box G, adapted to an opening in the casing F, and arranged to slide in the same, substantially in the manner described.

6. The above, in combination with the spring *n* and its flap *n'* for holding and guiding the plates *x*.

7. The combination of the pulleys *p* and *p'*, the band *q*, its projections *q'*, and the spring *w*, the whole being constructed, arranged, and operated substantially as described, for propelling, holding, and guiding the nail-plates.

8. The rollers *v v'* and the springs *y*, y^1, and y^2, within the passage *z*, combined and arranged as and for the purpose specified.

9. The lugs *u* of the spindle *r'*, combined with the adjustable sleeve *t* and spring *t'*.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

EZRA B. LAKE.

Witnesses:

JOHN WHITE,

JNO. B. HARDING.