F. ROCHOW.

Nail-Feed Attachment for Nailing-Machines.

No. 164,332. Patented June 8, 1875.

Fig: 1

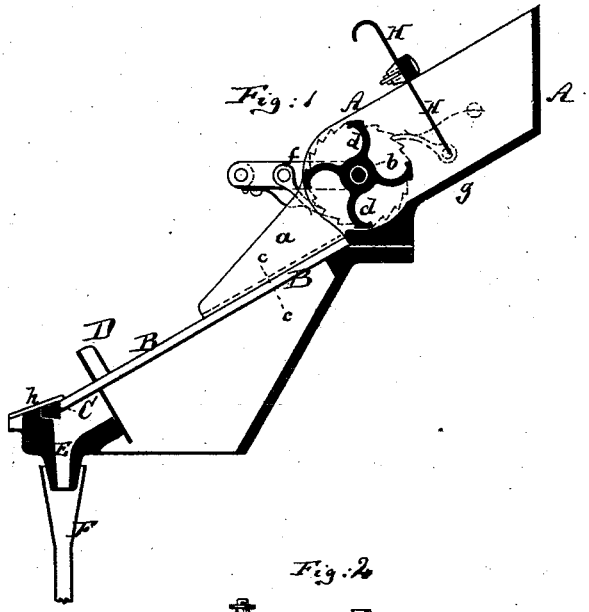


Fig: 3

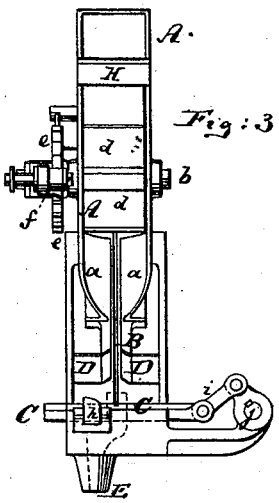


Fig: 2

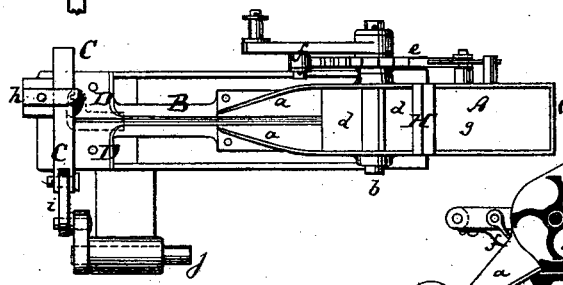


Fig: 4

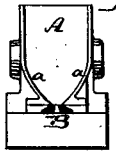
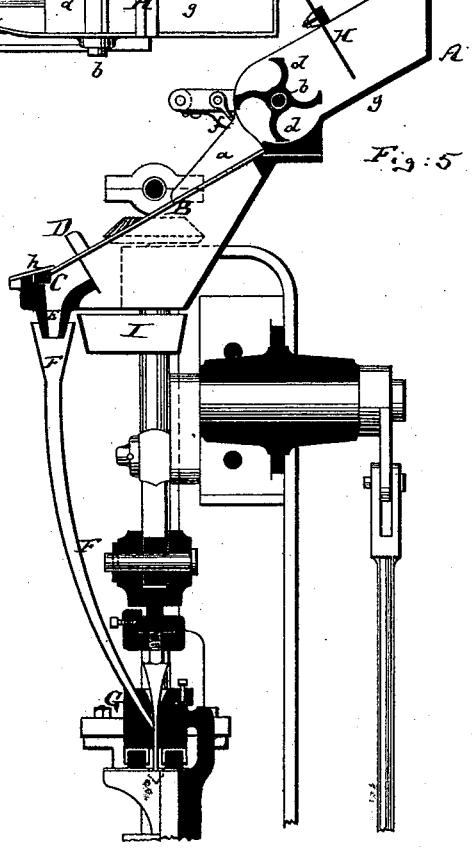


Fig: 5



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UNITED STATES PATENT OFFICE.

FERDINAND ROCHOW, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN NAIL-FEED ATTACHMENTS FOR NAILING-MACHINES.

Specification forming part of Letters Patent No. **164,332**, dated June 8, 1875; application filed May 7, 1875.

To all whom it may concern:

Be it known that I, FERDINAND ROCHOW, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Nail-Feed Attachment to Nailing-Machines, of which the following is a specification:

This invention has for its object to supply to machines for nailing boxes an automatic nail-feed, by which the nails will be singly and properly fed to the places required for the operation of the nailing-machines, the action of the nail-feed being in harmony with that of the nailing-machine, as hereinafter more fully described.

In the accompanying drawing, Figure 1 represents a longitudinal vertical section of my improved nail-feed attachment. Fig. 2 is a plan view of the same; Fig. 3, a front elevation thereof; Fig. 4, a vertical cross-section on the line *c c*, Fig. 1; Fig. 5, a longitudinal vertical section thereof, on a reduced scale, showing it applied to a box-nailing machine.

Similar letters of reference indicate corresponding parts in all the figures.

A is a hopper or vessel, which is placed in an inclined position, as in Figs. 1 and 5, on the frame of a box-nailing machine, or any other suitable support, so that it will be at the proper place with reference to the receiving-jaws and plungers of the nailing-machine. This hopper is open at its lower end, and terminates, toward its lower end, in converging side pieces *a a*, as shown in Figs. 2 and 3. Within this hopper is hung a transverse shaft, *b*, which carries a feed-wheel, *d*, said feed-wheel being composed of a series of wings that extend across the entire width of the hopper, substantially as indicated in Figs. 1 and 2. The end of the shaft *b* on the outside of the hopper carries a ratchet-wheel, *e*, to which intermittent rotary motion is imparted by a pawl, *f*, which is connected with the operating mechanism of the nailing-machine, or otherwise operated to impart the necessary motion to the wheel *e*, and thereby to the shaft *b* and feed-wheel *d*. The bottom *g* of the hopper A extends some distance forward of the shaft *b*, as in Fig. 1, but terminates about at the place where the sides *a a* begin to contract. These contracting sides *a a* are so arranged with reference to each other that their lower edges form a narrow straight slot, in continuation of the bottom *g* of the hopper. This straight slot is continued in an inclined plate, B, which extends forward and downward from the bottom *g* of the hopper to the reciprocating nail-conveyer C. Between this nail-conveyer C, which is a laterally-movable bar, made, by preference, of hard steel, and the front or lowermost ends of the contracting sides *a a*, are interposed shields D D, which extend, respectively, from opposite sides of the slot in the guide-plate B, and stand at right angles to such plate B, as clearly shown in the drawing. The nail-conveyer C, which, as stated, is a transversely-movable bar, is placed in its bearings directly near the lower end of the plate B, and has on its edge which faces the plate B a notch, which is clearly indicated in Fig. 3. A wiper, *h*, is fastened to the supporting-frame, so as to extend over the nail-conveyer C, said wiper having a beveled edge on its inner end, and on that side which faces the slot of the guide B. Beneath the beveled end of the wiper *h* a hole is cut through the lower extension of the guide-plate B, which leads into a funnel, E, said funnel communicating with a tube, F, that leads to the receiving-jaws G of the nailing-machine, as shown in Fig. 5. H is a gage, placed across the hopper above the feed-wheel *d*, and made vertically adjustable, so that it can be set to admit a larger or smaller quantity of nails at one time to the feed-wheel. The nail-conveyer C is, by a rod, *i*, connected with the crank of a suitable shaft, *j*, which receives oscillating motion by proper connection with the mechanism of a nailing-machine, or otherwise.

The operation of the nail feed is substantially as follows: The nails are fed to the hopper behind the gage H, and gradually fall forward on the inclined bottom of the hopper, so that they come within reach of the feed-wheel *d*. This wheel takes up the nails in its wings and throws them into the contracted part of the hopper, between the converging sides *a a* thereof, so that, in so falling into this part of the hopper, the nails will be forced to drop with their points down through the slot of the guide-plate B, their heads being supported on the plate B or on the lower parts of the side

plates *a a*, that come together sufficiently close to receive the shanks of the nails, but not near enough to allow the heads to pass through. On the inclined supports *a* the nails will, by their own gravity, aided by the vibrations of the operating machine, slide upon the guide B. On the inclined guide B the nails, with their heads resting thereon, will slide downward until they come in contact, one after another, with the reciprocating nail-conveyer C. Whenever this nail-conveyer is drawn backward—that is to say, moved toward the shaft *j*—it brings its notch in a line with the slot of the guide B, and receives in this notch or shank one of the nails. This nail it carries with it through its subsequent forward motion until the head of the nail comes in contact with the beveled part of the wiper *h*, whereby the nail is gradually moved out of the notch of the conveyer C, and thrown, through the hole of the plate B, into the funnel E and tube F. Between the lower ends of the side plates *a a* and the shields D D, which extend close up to the slot, the guide-plate has its upper surface beveled, so that its slotted central part will be higher than its outer edges, as clearly shown in Fig. 4. This is for the purpose of allowing any nails which may, by the feed-wheel *d*, be thrown upon the guide-plate B without falling into the slot in the requisite manner to fall over the slanting sides of the guide-plate B into a suitable receptacle, I, which is placed for their reception beneath the guide-plate, in the manner clearly indicated in Fig. 5, while if, as may happen, some of the nails should not fall into this receptacle I, but remain on the slanting surface of the guide-plate B, their discharge will be made certain by the shields D D, which will prevent such nails from passing farther downward on the guide B, and force them to fall over the sides into the box I. The motion imparted to the nail-conveyer C is in harmony with that of the nail-drivers or punches of the nailing-machine, so that, during the ascent of the driver or punch, the nail-conveyer pertaining thereto will move its nail toward the wiper and drop it into the tube F, and thereby into the jaws, where, upon its subsequent descent, the punch will find it and force it into the box. It is also clear that, instead of using a reciprocating single-notched nail-conveyer, C, a notched disk may be employed having intermittent rotary motion imparted to it, said disk, if employed, moving from the slot of the guide B to the wiper at the same time that the reciprocating nail-conveyer C would move such nail, but in the disk the backward motion necessary in the reciprocating nail-conveyer is dispensed with. The nails which drop into the box I, as stated, are emptied again into the upper part of the hopper, and fed forward as before.

The great difficulty with nail-feeds has heretofore been their tendency to get out of order. Nails are not always of the same size, especially the smaller kinds of nails, which are mostly employed in box-nailing machines, and if a smaller nail than that for which the nail-feed is intended is placed therein, it is liable to throw the entire apparatus of the ordinary nail-feed out of order; but by my invention this danger is entirely overcome, for even if a nail, by any means, should enter the notch of the conveyer C in an improper manner, say either at too great a height or in an inclined position, or otherwise, even then the relative position of the conveyer C and wiper *h* is such that all injury by the improper introduction of such nail will be avoided, because, being made of hard steel, these two parts C and *h* will cut the nail wherever it extends in the wrong direction, and thus prevent it from interfering with the proper motion of the parts.

Instead of making the guide B with slanting top it may be made quite narrow, and thereby answer the same purpose.

I claim as my invention—

1. The hopper A, constructed with the converging side plates *a a*, for receiving the nails from the transverse feed-wheel *d*, in combination with the slotted nail-guide B, all substantially as and for the purpose stated.

2. The transverse shields D D, in combination with the inclined slotted guide B of the nail-feed, substantially as and for the purpose specified.

3. The reciprocating notched nail-conveyer C, for receiving the nail from the guide and delivering it to the nail-tube, in combination with the guide B, nail-funnel E, and stationary wiper *h*, mounted above the conveyer, and adapted to dislodge the nail from the notch when brought directly over the tube, all substantially as shown and described.

4. The slotted nail-guide B, constructed with beveled sides, as shown, to prevent the nails from resting upon its upper surface between the hopper and conveyer, as set forth.

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