J. H. FOSTER & D. O'B. LADD.

Machine for Nailing Boxes.

No. 164,287. Patented June 8, 1875.

Fig. 1

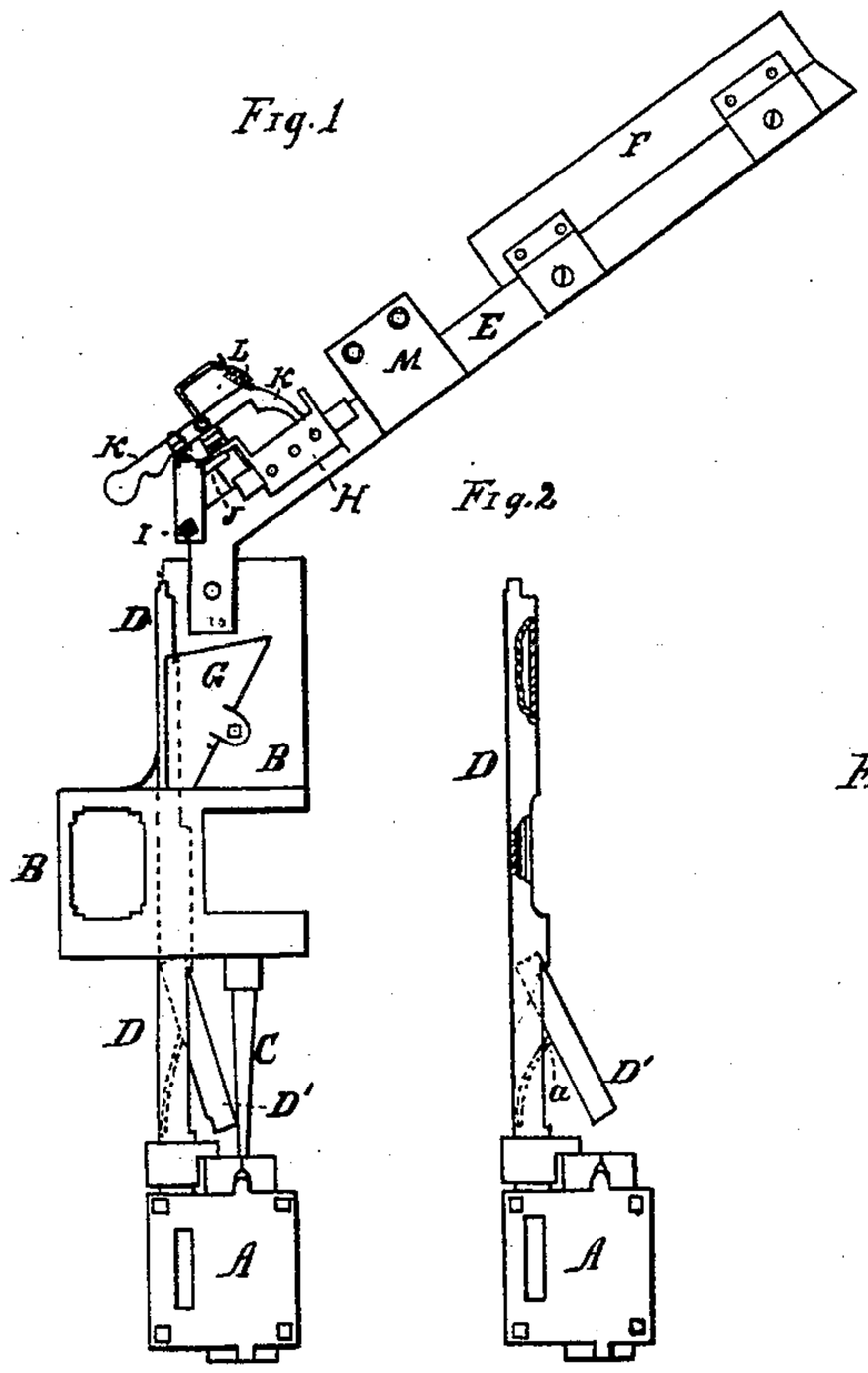


Fig. 2

Fig. 3

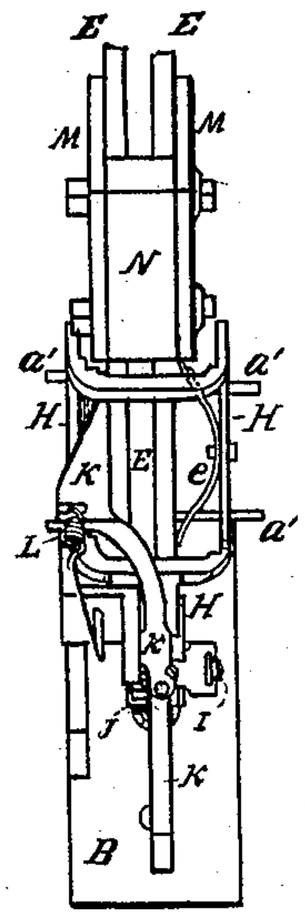
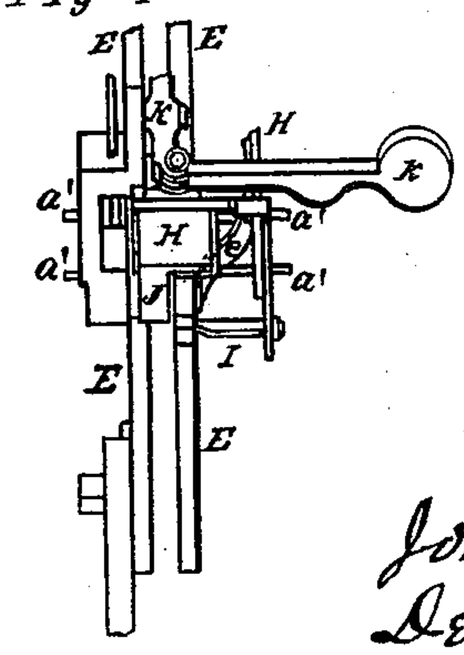


Fig. 4



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN H. FOSTER AND DENNIS O'BRIEN LADD, OF CHICAGO, ILLINOIS;
SAID LADD ASSIGNOR TO SAID FOSTER.

IMPROVEMENT IN MACHINES FOR NAILING BOXES.

Specification forming part of Letters Patent No. **164,287**, dated June 8, 1875; application filed November 10, 1874.

To all whom it may concern:

Be it known that we, JOHN H. FOSTER and DENNIS O'BRIEN LADD, both of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Nailing Boxes, of which improvements the following is a full, clear, and exact description, which will enable others skilled in the art to which our invention appertains to make and use the same, reference being had to the accompanying drawing, forming a part hereof, and in which—

Figure 1 is a side elevation of nail-feeding mechanism embodying our invention; Fig. 2, a like elevation of the die and hollow spindle detached, and adapted to be fed by an attendant; Fig. 3, a top or plan view of the rear part of the mechanism, and Fig. 4 a front elevation of the vertical part thereof.

Like letters of reference indicate like parts.

Our invention relates to that class of nail-feeding mechanism employed in connection with box-nailing machines; and consists of the novel features of construction hereinafter specified, our object being to improve the means heretofore employed for rendering the mechanism automatic, and also to render more safe, convenient, and rapid the operation of feeding the nails by hand.

In the drawing, A represents one of the dies which hold the nails in a position to be driven. B is one of the clips, which are supported on cross-bars of the machine, and which are provided with punches C, arranged to enter the dies and push the nails therefrom. D is a spindle attached to the die, and passing freely through the clip. E E are inclined parallel bars attached to the clip, and each provided with a lateral wing, F, arranged to receive the nails promiscuously, and conduct them into the space between the said bars. The space between the bars E E is such that the nails will hang vertically therein by their heads, and the inclination is such that they will slide downward toward the clips. The parts now referred to have been heretofore employed in devices of this class, and we will now describe the novel features constituting our invention.

We make the spindle or guide D hollow, and arrange therein, just above the die A, a hollow yielding finger, D′, pivoted or hinged at or near its upper end to the spindle. This finger is rendered yielding by means of a spring, *a*, which forces the lower end of the finger out of the spindle, as shown, the spindle being cut away for that purpose. The upper end of the spindle is also cut away on its periphery, as represented in Fig. 1. G is a small hopper or guide, having an inclined bottom, and being open at the end adjacent to the spindle, and also at the top. This hopper or guide is attached to the clip, and arranged in the manner shown with relation to the spindle. H is a yielding frame mounted on pins *a′ a′*, projecting laterally from the bars E E. This frame is rendered yielding by means of a spring, *e*, arranged between it and one of the said bars. I is a beveled pin attached to an arm carried by the frame H. J is a stop, also carried by the frame H. This stop is arranged at or near the lower ends of the inclined parts of the bars E E, and lies across the space between these bars, so as to prevent the further movement of the nails therein. The point of the pin I enters the side of one of the bars E E, and is arranged to pass behind the nail in contact with the stop J. When this stop lies across the space between the bars E E the pin I does not enter this space.

The stock of the pin I may be so attached to the frame H as to be laterally adjustable thereon. The stop J may also be adjustable, so as to be capable of being set at a greater or less distance from the pin I. K is a bent lever pivoted to a stud projecting from one of the bars E E, as shown. The forward end of this lever is arranged to be struck by the spindle, and the rear end is beveled and arranged between one of the bars E E and that side of the frame H not in contact with the spring *e*. The upper edge of this side of the frame is rounded off to prevent unnecessary friction. L is an open spiral spring attached to the rear end of the lever K, and to a support attached to one of the bars E E. The lever K is preferably jointed between its forward end and its pivot, in order that it may be turned away laterally, so as not to be struck by the spindle at all times. M M are vertical pieces on the bars E, and N is a removable block arranged

between the said vertical pieces, and sufficiently above the said bars not to interfere with the passage of the nails. The bars E E are firmly attached to each other by means of bolts and nuts, the bolts passing through the parts M M and the block N. The frame H is arched to admit of the passage of the nails along the space between the bars E E.

If the clip be rigidly held and the die moved up and down on the punch, the operation of the feeding mechanism now described will be as follows: The nails thrown promiscuously upon the wings F F will fall into the space between the bars E E, and will be suspended by their heads therein, the space between the bars being regulated to correspond to the size of the nails. The width of the space between the bars E E is regulated by the width of the block N, and we make this block removable, so that blocks varying from each other in width may be employed for this purpose. The nails thus suspended slide forward until stopped by the stop J. The punch is not in the die when the stop J lies across the space between the bars E E. When the die is moved upward on the punch the finger D′, by reason of its contact with the clip, is pushed into the spindle. The continued upward movement of the die brings the top of the spindle in contact with the forward end of the lever K, the rear end of which is thus forced downward. The downward movement of the rear end of this lever forces the frame H in such a direction that the stop J is carried away from the nail resting against it, and, at the same time, the pin I is carried in front of the next succeeding nail. The nail thus released drops into the spindle, passes into the finger D′, and rests on the bottom of the spindle, or, if it misses the spindle, it is caught by the hopper or guide G and passes thence into the spindle, the open part of the upper end of the latter being now sufficiently low to receive the nail from the said hopper. If, however, the opening in the spindle is not now low enough to receive the nail from the hopper, the nail will pass from the hopper into the spindle when the latter descends sufficiently for that purpose. When the die is drawn downward from the punch the forward end of the lever K is released. The spring L then lifts the rear end of the said lever from between the frame H and the bar E adjacent to the lever, and the said frame is returned to its original position by means of the spring *e*. This movement of the frame draws the pin I from the nails, and carries the stop J in front of them. Only one nail, therefore, drops into the spindle at the same time.

The continued downward movement of the die releases the finger D,′ and the lower end of the latter is then thrown forward by the spring *a*. The nail inclosed by the finger then passes into the die, and is forced into the box during the next upward movement of the die, which movement also releases another nail, in the manner described. In this manner the nails are fed, one by one, automatically, into the die, so that a nail will be driven into the box each time the die is moved upward. Each die of the machine is provided with the feeding mechanism described, and the dies are forced upward automatically during the operation of the machine. The same result, however, will be produced if the dies are fixed and the punches movable.

In order to enable an attendant to feed the nails into the dies without employing the bars E E and their attachments, we make the said bars removable from the clips. When the bars E E are detached from the clips the nails may be dropped directly into the hopper G by the attendant, and in the latter case we deem it preferable to plug up the upper part of the spindle, so that the nails will only enter the spindle during the upward movement of the dies. It is immaterial, however, when the nails are fed into the spindle, so long as they are so fed as to enter the dies so as to be struck in succession by the punches. The wings F F are chiefly intended to be used in connection with a device for throwing the nails upon them automatically; but the nails may also be thrown thereon by an attendant.

It will be perceived from the foregoing description that an attendant may feed the nails into the spindles without danger of being injured by the punches. It will also be perceived that the nails may be fed, one by one, to the dies, with certainty, and automatically, after being cast promiscuously upon the wings F F. The hopper G is only essential for the purpose of conducting into the spindle the nails which do not fall into the latter from the wings, and to render convenient the operation of feeding the nails into the spindle by hand without employing the wings. The nails may be fed directly into the spindle by hand. If the spindles and punches are made sufficiently long to admit of the nails being driven without carrying the finger D′ into the clip, the said finger need not be yielding. The spindle serves as a guide to the die and as a nail-conductor.

We are aware that a tube has heretofore been employed for the purpose of conducting the nails to the dies, and we do not here claim such, broadly; but

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of the traveling hollow spindle or guide and nail-conductor, open at or near the top and bottom, the clip, and the die, all arranged and operating together substantially as described, and for the purposes specified.

2. The combination of the hollow spindle D, the yielding finger D′, the clip, and the die, substantially as and for the purposes specified.

3. The combination of the fixed guide or hopper G and the hollow spindle D D′, carried by the die and passing freely through the clip, substantially as and for the purpose specified.

4. The combination of the guide-bars E E, the yielding frame H, provided with the pin I and the stop J, the lever K, and the hollow spindle, substantially as and for the purposes specified.

5. The guide-bars E E, provided with the vertical pieces M M, in combination with the removable block N, attached to the said pieces by means of bolts and nuts, substantially as shown and described, for the purpose of thereby rendering the said bars adjustable to nails of different sizes.

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