

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN NAIL-DRIVING MACHINES FOR SHOE-MAKING.

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To all whom it may concern:

Be it known that I, SAMUEL HARRIS, of the city of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Nail-Driving Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms part of this specification, and in which—

Figure 1 represents a vertical longitudinal section of a nail-driving machine constructed in accordance with my invention; Fig. 2; a horizontal section on the line *x x*; Fig. 3, a vertical transverse section on the line *y y*. Fig. 4 is a vertical transverse section upon a larger scale of duplicate chutes, and a slotted guide or bed plate for conducting two different sizes of nails to the die, through which they are driven into the work.

This invention, while more particularly designed for nailing soles on boots and shoes, is applicable to driving nails in the construction of boxes, and for various kinds of work.

The invention consists in certain novel devices, combinations, and peculiar constructions or arrangements of parts, as hereinafter more particularly described, whereby the several operations of separating, feeding, and driving the nails are facilitated.

The machine represented in the drawing is adapted to presenting and dividing two sizes of separate or loose nails; but it might be constructed, at least so far as certain features of the invention are concerned, to working either only one size of nail or more than two sizes. It will suffice here, however, to describe the machine as adapted to working two sizes of nails.

A A are the hoppers or receiving-chambers for the separate reception and distribution of two sizes of nails. These chambers are arranged on opposite sides of the machine, at the back end of it, and are provided with revolving pickers-up C C, armed with pins or other projections, and which serve to pick up the nails and deposit a certain number of them at a time over bridges *b b* onto the chutes, and to throw back the surplus nails into the hoppers. The chutes D D, for passing the two sizes of nails to the front of the

machine, are each composed of parallel wires, bars, or rods, of which there are here shown three to each chute—that is, two lower wires and one upper one—arranged at a suitable distance apart, so that the heads of the nails rest on the two lower wires, while the upper wire serves to act as a guard to prevent the nails from being jerked up or out. The lower wires of each chute alone enter the chambers back of the bridges *b*, to receive the nails, point downward, in between them. Said chutes D D are set slightly inclining downward from the back toward the front of the machine, and are arranged over a longitudinally-slotted bed, E, within the slots of which the nail-points enter and are guided by as the nails are fed or move forward toward the front of the machine.

It is desirable only to support or bind the wires of the chutes at or near their front and back ends, in order that the elasticity of the wires may not be restricted, and their freedom to independently vibrate by the jar produced in the working of the machine may be preserved, the vibration of the chute being important as regards effecting the feed of the nails, and the construction of the chutes of separated wires, or of skeleton form, as described, importantly assisting to effect the result.

The front or delivery ends of the chutes D D are bent to approximate each other, and arranged between such bent ends is an adjustable cut-off, G, which may be turned or set by hand to cut off or stop discharge from either or both of the chutes, accordingly as it is required to use the larger nails supplied by the one chute, or the smaller nails supplied by the other chute, or to stop the supply from both chutes. H is a rotary die, arranged to occupy an upright position in front of the chutes D D, on and through the main bed or table I of the machine. Said die may be rotated by gearing *f g h i* from a main shaft, J, or by any other suitable means. Its direction of motion is indicated by arrow in Fig. 2. The upper surface of this die, which presents an extended or table-like top, is on a level, or thereabout with the bottom of the front ends of the chutes, and is slotted, as at *m*, from its exterior to the hollow center *n* of the die, to

form a feeder, as said die is rotated for taking the nails one at a time from the front of either chute D, and conveying the nail to the hollow center of the die, down which it drops or is forced by the driver K, that receives its up-and-down motion by a cam, *r*, and spring *s*, or otherwise, to drive the nail into the work, which is suitably adjusted, fed, or held below the bottom of the die for the purpose.

By thus combining the feeder of the nail from the chute or chutes with the die a separate sliding block for conveying the nail to the die, and much complication generally, is avoided, as well as greater compactness and efficiency obtained for the machine.

This rotating die H, with its slotted portion or feeder *m*, may be used in connection with a single chute only, if desired; but the same admits of being used, as shown, in connection with duplicate chutes, from either one of which the different-sized nails carried by the chutes may be taken in regular succession, or otherwise.

To perfect the action of the feeder *m*, a guide, M, which may be fixed, is arranged over the top of the die H, to one side of the hollow *n* of the latter, and so that the slotted portion or feeder *m*, as it takes the nail from the chute, draws it along said guide into the hollow of the die.

I claim—

1. A rotary die slotted from its exterior to its center, to form a feeder for conveying the nail to the center of the die, down or in which the nail is deposited for subsequent operation on it by the driver, essentially as specified.

2. The combination of the guide M with the slotted portion or feeder *m* of the rotating die H, substantially as described.

3. The combination, in a machine for presenting or feeding and driving different-sized nails, of a combined rotary die and slotted feeder with one or more pairs of chutes, for conveying the nails to the die, essentially as specified.

4. The combination, with duplicate chutes D D, of a cut-off, G, adapted to stop the delivery from either or both of the chutes, substantially as specified.

5. A nail-feeding chute, composed of two lower and a single upper elastic and independently-vibrating wires, rods, or bars, substantially as herein described.

6. The combination of one or more hoppers, A, rotary pickers-up C, bridges *b b*, and chutes D D, substantially as herein described.

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Witnesses:

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