(No Model.)

# S. N. SMITH.

## MACHINE FOR MANUFACTURING LACING HOOKS.

No. 260,250. Patented June 27, 1882.

*Fig. 1.*

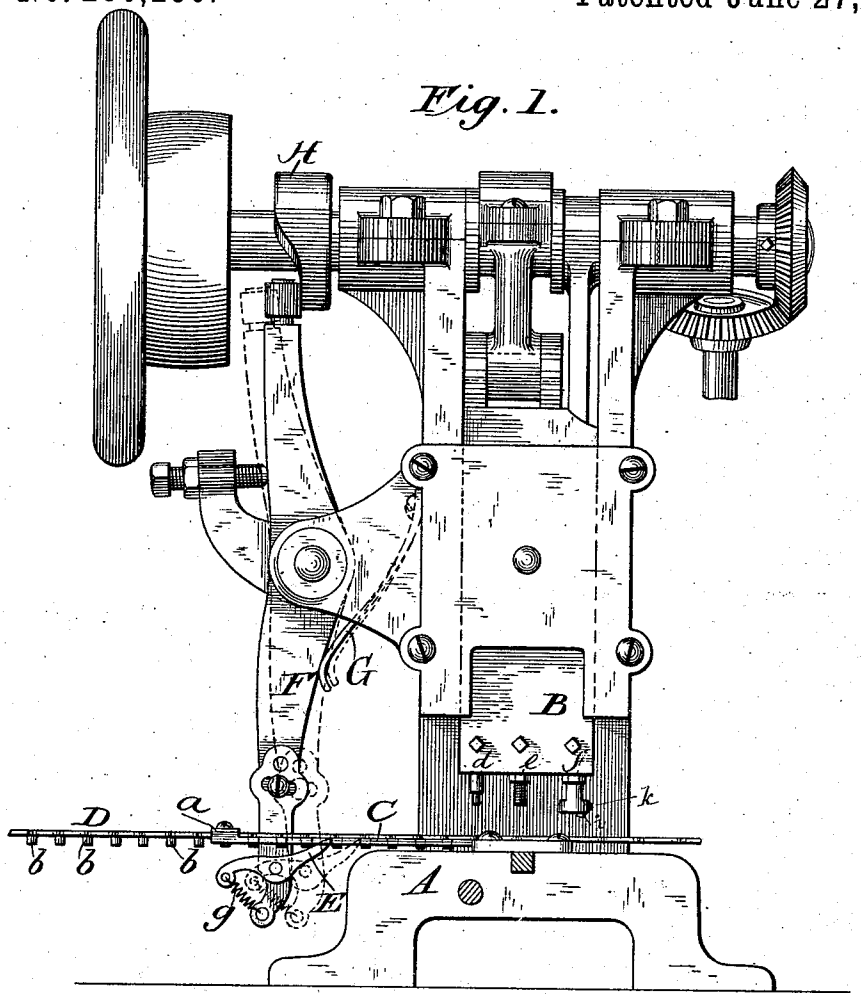



*Fig. 2.*

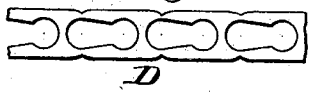



*Fig. 3.*

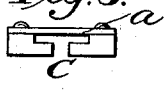



*Fig. 4.*

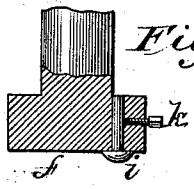
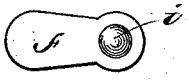



*Fig. 5.*




Attest.

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# UNITED STATES PATENT OFFICE.

STEPHEN N. SMITH, OF PROVIDENCE, RHODE ISLAND.

## MACHINE FOR MANUFACTURING LACING-HOOKS.

SPECIFICATION forming part of Letters Patent No. 260,250, dated June 27, 1882.

Application filed August 11, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN N. SMITH, of Providence, in the county of Providence and State of Rhode Island, have invented certain Improvements in Machines for Manufacturing Lacing-Hooks, of which the following is a specification.

This invention relates to machines for the manufacture of shoe lacing-hooks from prepared stock consisting of narrow strips of metal having tubular necks formed thereon at regular intervals, the invention relating to the mechanism for feeding the stock through the machine and to the punch which is employed for cutting the blanks from the stock.

The devices are applicable to machines in general of this class, but are more particularly designed for use with machines similar to those represented in my application for Letters Patent filed July 28, 1879.

The feed mechanism constituting the first feature of the present invention consists in a reciprocating finger or dog arranged to operate against the exterior of the necks or eyelets of the stock on the under or rear side of the latter for the purpose of advancing the stock intermittingly through the machine.

The second feature of the invention consists in providing the punch by which the blanks are cut from the stock with a rounded protuberance to indent the stock, this protuberance being made detachable from the punch at will in order that the punch may be readily ground and sharpened.

The machine represented in the drawings is in its general construction similar to that represented in my application above referred to, to which reference may be made for a detailed description of its construction and mode of operation as regards the devices by which the blanks are carried from the cutting-punch and bent into form.

Referring to the accompanying drawings, Figure 1 represents a front elevation of the machine; Fig. 2, a top plan view of the stock as it appears after the removal of blanks from one end; Fig. 3, an end view, illustrating the construction of the guide through which the stock is passed; Fig. 4, a vertical section of the punch by which the blanks are cut and indented; Fig. 5, a bottom face view of the same.

A represents the base or table of the machine, over which the stock is carried and upon which it is supported while being acted upon by the various punches.

B represents a vertically-reciprocating head, provided with three punches, *d*, *e*, and *f*, which serve respectively to cut the bottom from the tubular necks of the stock, to score or crease the interior of said necks, and to cut and indent the blanks.

C represents a guide arranged horizontally and transversely upon the table, with one end overhanging the same to receive and sustain the stock. This guide, as represented in Fig. 3, has a vertical slot in its under side, through which the tubular necks or eyelets *b* of the stock depend, while the body of the stock rests in or upon the under surface of the guide. At its receiving end the guide is provided with a transverse bar, *a*, overlying the same, to prevent the stock from being lifted out of place. If desired, two or more of these bars or a long covering-plate may be used above the stock.

D represents the strip of stock, consisting, as usual, of a narrow ribbon of brass or similar ductile material, provided at suitable intervals with the eyelet necks or tubes *b*, before referred to.

E represents the feed-dog, by which the stock is advanced through the machine. The dog consists simply of a pivoted finger mounted on the lower end of an upright vibrating lever, F, the latter being mounted on the side of the machine and vibrated by means of a spring, G, tending to throw it in one direction, and a cam, H, acting upon its upper end and tending to move it in the opposite direction. The feed-dog E is acted upon by a spring, *g*, which tends to throw its forward end upward, but permits said end to be depressed as it is carried backward beneath the necks upon the stock.

It will be observed that the feed-dog lies beneath the stock-guide in such position that its nose can engage with the depending necks of the stock.

The machine being set in motion, the vibration of the lever F causes the feed-dog to move to and fro, its forward end acting against one of the necks *b*, advancing the stock a suitable distance, then retreating and passing over the next neck, behind which it engages to advance the stock, as before, and so on repeatedly, the dog engaging with the necks one after an-

other and advancing the stock intermittingly through the machine.

The feed devices and the punches are arranged to operate alternately, the stock remaining at rest during the action of the punches and being advanced as the punches retreat.

I am aware that a vibratory feeding-finger arranged above the stock, with its nose arranged to engage within the tubular necks, has been used, and this I do not claim.

The arrangement represented in the drawings has been found in practice superior to the old plan, in that it is more accurate in its operation and less liable to mutilate or injure the stock, and also in that the feeding-dog located beneath the stock and guide will leave a free unobstructed space above the latter, giving the attendant an unobstructed view of the stock and permitting the latter to be introduced into the machine more readily.

It is obvious that the form and arrangement of the feed devices may be modified, provided the reciprocating dog is arranged to act against the projecting necks of the stock in substantially the manner represented.

Passing now to the second feature of the invention—the indenting and cutting punch shown at *f*—it will be seen to consist simply of a flat-faced punch having an outline of the form of the required blank, with a rounded hemispherical protuberance, *i*, located at one end, for the purpose of indenting the blank to form the rounded projection upon the head of the hook.

It will be seen that the protuberance *i* is made separate from the punch, and provided with an elongated neck or spindle seated vertically in the punch and secured by means of a binding-screw, *k*. This construction permits the protuberance to be removed from the die at will, allowing the face of the latter to be ground against the flat stone for the purpose of sharpening its edges, as may be required.

I am aware that a punch made in one piece with the protuberance thereon is old, my invention in this regard being limited to the application of the protuberance in such manner that it may be removed at will.

Having thus described my invention, what I claim is—

1. In a machine for making eyelets or lacing-hooks, the combination of a slotted guide for the necked stock, the punch arranged to descend upon the stock above the guide, and the reciprocating feed-dog arranged to operate against the projecting necks of the prepared stock beneath the guide.

2. In combination with the guide slotted to receive the depending necks of the stock, the feeding-finger located thereunder to engage with said necks.

3. The combination of the slotted guide, lever F, dog E, and spring G, substantially as shown.

4. The cutting-punch provided with the removable protuberance, substantially as described.

5. The cutting-punch *f*, in combination with the protuberance *i*, having its neck or spindle secured by means of a binding-screw.

STEPHEN N. SMITH.

Witnesses:
SANFORD C. HOVEY,
GILMAN E. JOPP.