

H. C. BRADFORD.

Machines for Setting Buttons and Lacing-Hooks.

No. 135,763.

Patented Feb. 11, 1873.

Fig. 1.

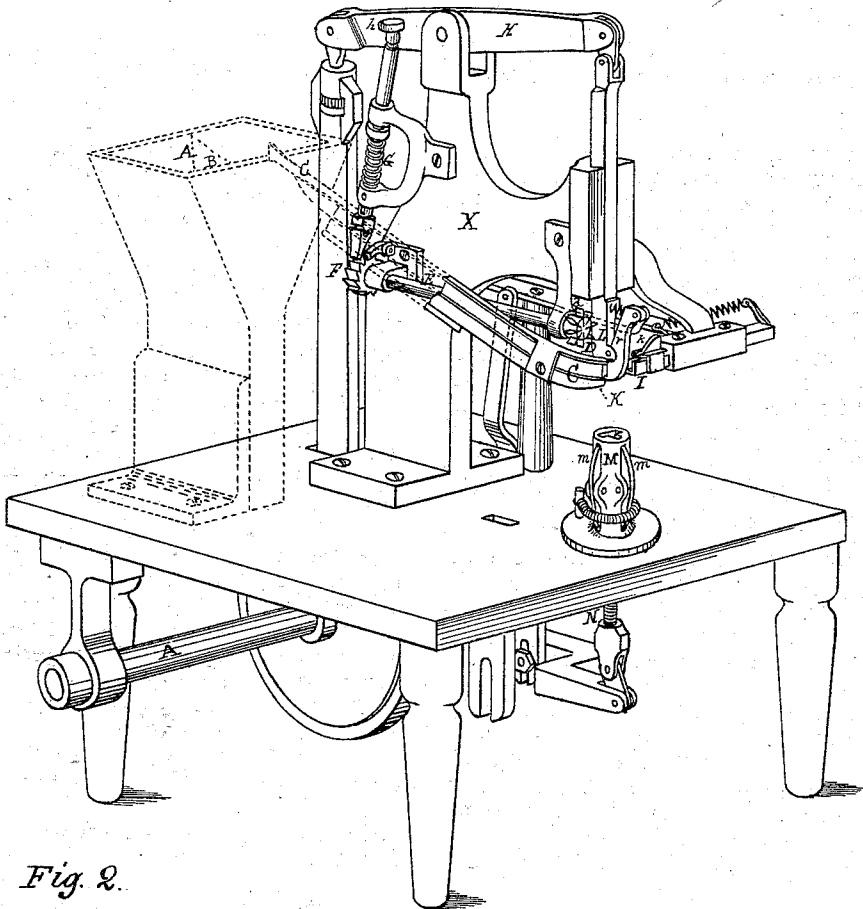


Fig. 2.

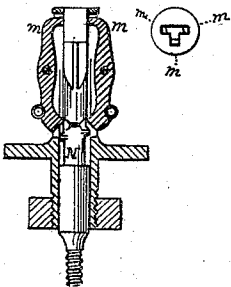


Fig. 3.

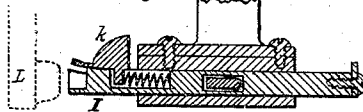
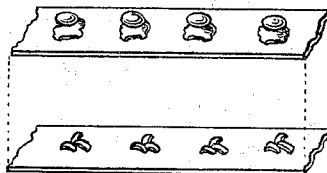


Fig. 4.



Fig. 5.



Witnesses.
Phil. A. Garner
Geo. T. Keng-

Inventor.
Horace C. Bradford,
By Wm. Wood
Attorney.

UNITED STATES PATENT OFFICE.

HORACE C. BRADFORD, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN MACHINES FOR SETTING BUTTON AND LACING HOOKS.

Specification forming part of Letters Patent No. **135,763**, dated February 11, 1873.

To all whom it may concern:

Be it known that I, HORACE C. BRADFORD, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Machines for Setting Button or Lacing Hooks.

My improvements relate generally to machines adapted for automatically setting in leather or cloth the "Shurtleff" lacing-hook, and other hooks or shank-pronged buttons having similar characteristics. My present invention consists, partially, in combining with an inclined conducting-chute a finger-wheel, partially rotated intermittently, for retaining the line of hooks in the chute, for releasing them singly, and advancing them one by one toward the clinching mechanism; and also in operating the several clinching-fingers so that the prongs of the hook will be successively turned toward the center, instead of being simultaneously turned, as in machines heretofore constructed; and also in providing the transfer-bar with a holding-finger; and I do hereby declare that the following specification, taken in connection with the drawing furnished and forming a part of the same, is a clear and accurate description of a machine embodying the several features of my invention.

Referring to the drawing, Figure 1 represents, in perspective, a machine mainly constructed in accordance with the description annexed to Letters Patent issued to me February 27, 1872, No. 124,029, but also embodying my present improvement. Fig. 2 represents, in vertical section and in top view, the turning and clinching mechanism. Fig. 3 represents, in longitudinal section, my improved transfer-bar. Fig. 4 represents a lacing-hook somewhat enlarged. Fig. 5 represents, in front and rear view, some of the lacing-hooks applied to leather, as on boots or shoes.

Reference being had to my former Letters Patent, it is deemed unnecessary for me to now describe in detail the entire machine shown.

It is to be understood that the lacing-hooks are thrown in mass into the hopper A; that a separator, B, lifts them from the mass and transfers them to the chute C, which allows only those properly presented to it to slide downward until arrested in their movement by my novel finger-wheel D. This fin-

ger-wheel is mounted on a shaft, E, which is, in this instance, sustained in hangers projecting from the standard X of the machine. The rear end of the shaft E is provided with a ratchet-wheel, F, which is so arranged with relation to a vertical spring-pawl, G, that a certain downward movement of the latter will rotate the ratchet-wheel, shaft, and finger-wheel a distance equal to the spaces between the fingers *d* on the finger-wheel, each of which is equal to the width of the head of a lacing-hook. The vertical spring-pawl is, in this instance, actuated by the downward movement of the rear end of the beam-lever H by reason of the contact of the upper end of the pawl with a shoulder, *h*, on said beam-lever. An expansive spiral spring forces the pawl upward when the beam-lever ascends. It will be readily obvious that intermittent movement may be communicated from other adjacent parts of the machine. The finger-wheel is so placed with relation to the chute that no lacing-hook can possibly pass between the ends of the fingers *d* and the top plate of the chute. As the wheel is rotated the hooks will, one by one, be released and started down the incline by one of the fingers, while the next preceding finger will always be in contact with the next preceding hook in the line.

As heretofore constructed, separate vibrating fingers have been employed in this connection which, operating alternately, would hold back the advancing line and release the lowest hook, which, by its own gravity, would proceed to the bottom of the chute and be delivered to the clinching mechanism. Whenever the lower hook, by getting cramped in position or by having a roughened part in contact with the chute, failed to move on being released, there was no means for starting it onward.

By my improved finger-wheel the combined operations of the holding and releasing fingers are performed, and in addition thereto it operates as a "starter" should the lower hook, by any means, fail to descend by its own gravity.

On being released and started by the finger-wheel the hook descends, and on reaching the bottom of the chute is conveyed therefrom to the transfer-bar I by means of a transfer-finger, K. The nippers L then seize the hook at its lacing-space and the transfer-bar retires,

all substantially as fully set forth in my former Letters Patent referred to.

The transfer-bar I is provided with a novel holding-finger, *k*, fully illustrated in Fig. 3. An expansive spiral spring is so set within the bar as to bear against the finger and hold it in a well-advanced position, so that the tip of the finger will be nearly on a line with the end of the transfer-bar. The upper surface of the transfer-bar is slightly concave longitudinally in order that it may more readily receive and hold the hook when received from the transfer-finger. The finger *k* enters the lacing-space of the hook and operates, in a measure, like the top plate of the chute, so far as it relates to holding or steadying the hook in position. In order that the finger may promptly retire from the lacing-space when the nippers descend a cam-faced back is provided, which, by contact with a corresponding cam-faced projection on the side of the nippers, forces the finger back against its spring, and by such movement more perfectly adjusts the hook on the transfer-bar preparatory to the closing of the nippers upon it. The clinching-block M is similar to that shown and described in my former Letters Patent referred to. A T-shaped space in the top thereof is prepared for the reception of the three prongs of the hook after they have been forced through the leather by the descending nippers. In said former Letters Patent the clincher N, on moving upward, simultaneously inclined inward the tops of the three turning-fingers *m*, and by that means bent the prongs inward simultaneously toward a common center. The simultaneous operation of the fingers is more or less liable to cause the ends of the prongs to abut against each other, and, unless the metal of which they are composed be soft and very flexible, the prongs will be imperfectly flattened.

My improvement on the turning and clinching mechanism consists, therefore, in giving to the turning-fingers successive action—as, for instance, the front finger will be operated first, and then the ones on the right and left successively. By this means the front prong will

be first well inclined, and the second will be next inclined and made to more or less lap upon the first; and, finally, the third will be bent, and also made to lap upon the first, and will be then flattened into the leather by the continued upward advance of the clincher, which compresses the bent prongs between it and the nippers. In Fig. 5 the clinched prongs are fully illustrated. The vertical edges of the side fingers, where they come in contact with the prongs, are slightly angular, so as to cause the desirable evasion of contact of the points of the side prongs when bent inward.

The operation of the turning-fingers is effected by cam-faced projections on the clincher, which, by contact with the fingers below their pivots, force them outward below and inward at their tops. The successive operation is effected by placing these cam-faced projections at different longitudinal points on the clincher. The several turning-fingers are controlled by a retractile spiral spring common to all, and which embraces the clinching-block.

In my former Letters Patent each turning-finger was provided with a separate bow-spring.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The finger-wheel, arranged to be intermittently rotated, in combination with the inclined chute, substantially as described, whereby the line of hooks in the chute may be held in place, and the lowest in line released and started downward, as and for the purposes specified.

2. The combination, with the transfer-bar and the nippers, of the finger *k*, arranged to retire on the descent of the nippers, substantially as described.

3. The turning-fingers, arranged to operate successively upon the prongs of the hook, in combination with the clincher, substantially as and for the purposes specified.

HORACE C. BRADFORD.

Witnesses:

JOHN C. PURKIS,
HENRY MARTIN.