No. 659,746. Patented Oct. 16, 1900.

R. F. HARGRAVES.

MACHINE FOR SETTING LACING HOOKS.

(Application filed Feb. 21, 1900.)

(No Model.) 3 Sheets—Sheet 1.

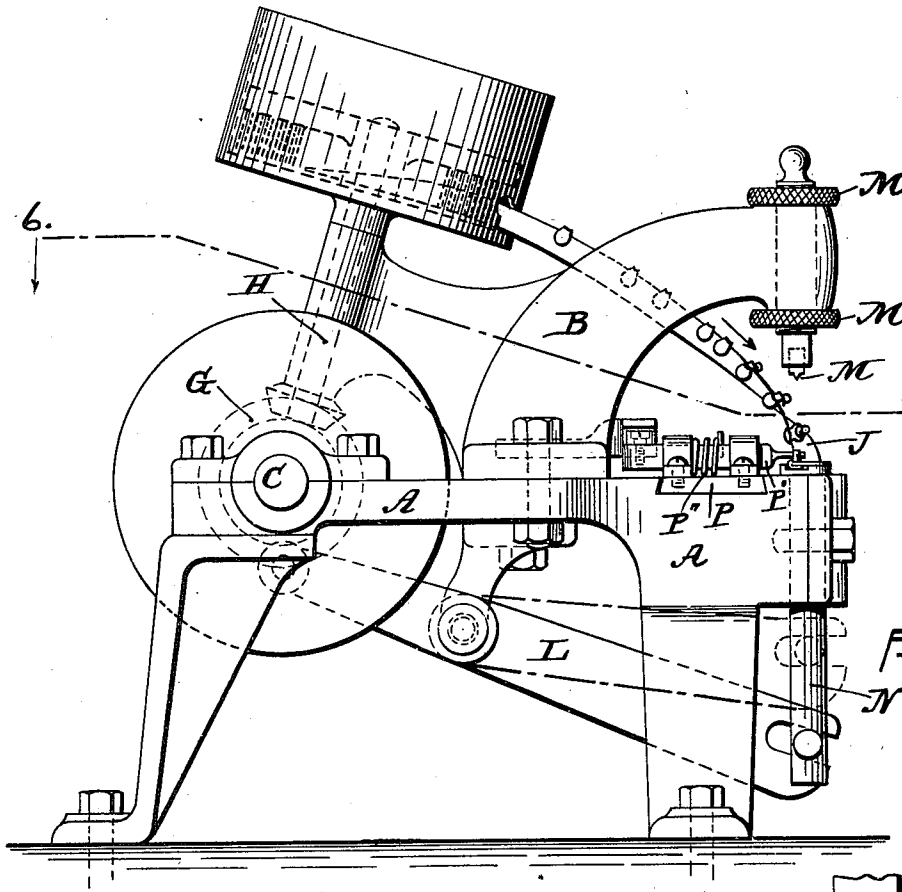


FIG. 1.

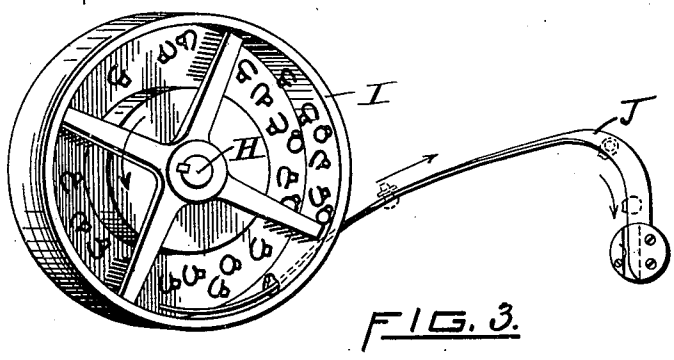


FIG. 3.

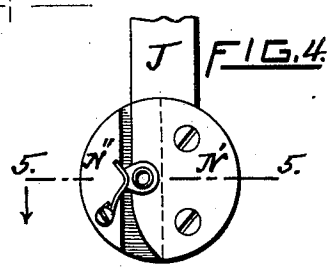


FIG. 4.

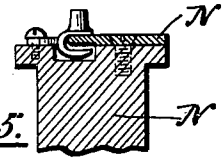


FIG. 5.



FIG. 2.

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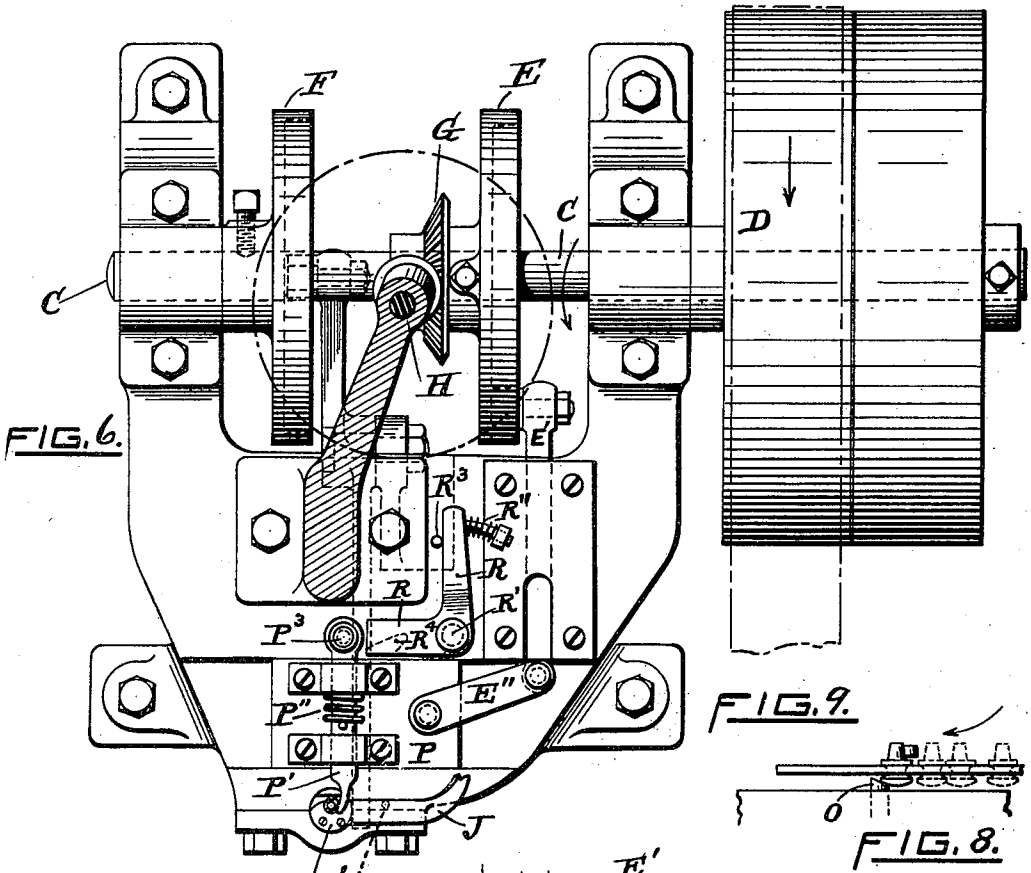


FIG. 6.

FIG. 9.

FIG. 8.

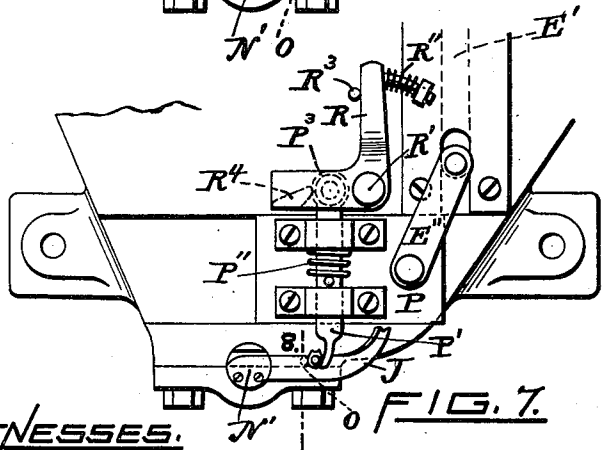
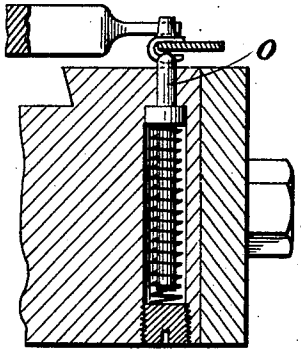


FIG. 7.



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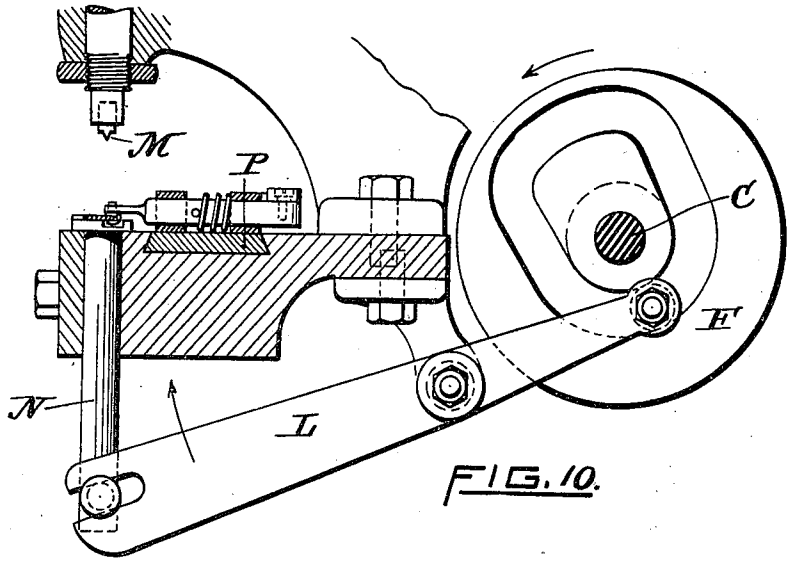


FIG. 10.

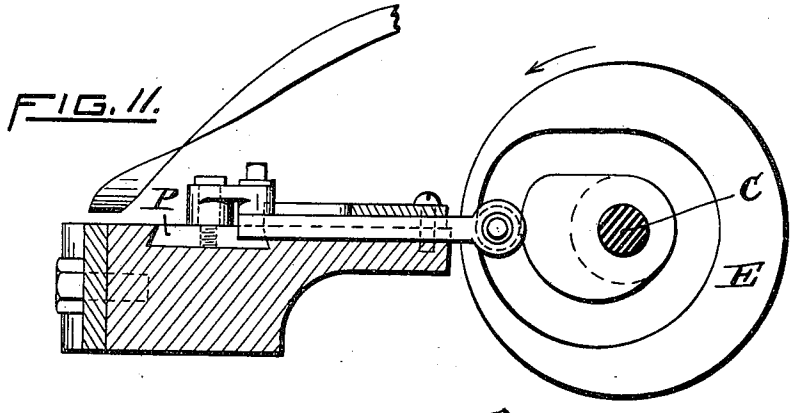


FIG. 11.

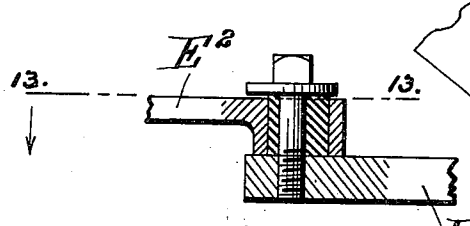


FIG. 12.

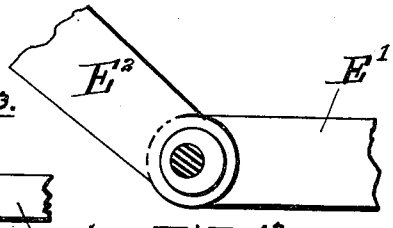


FIG. 13.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR SETTING LACING-HOOKS.

SPECIFICATION forming part of Letters Patent No. 659,746, dated October 16, 1900.

Application filed February 21, 1900. Serial No. 6,074. (No model.)

To all whom it may concern:

Be it known that I, ROBERT F. HARGRAVES, a citizen of the United States, residing in the city of Providence and State of Rhode Island, have invented certain new and useful Improvements in Machines for Setting Lacing-Hooks, of which the following, with the drawings hereby made a part hereof, is a description and specification.

The portion of this class of machines which has been the subject of most inventions is the mechanism employed to bring the lacing-hooks into position for setting, and the principal parts of my present invention have reference to this mechanism. In improving that mechanism I believe I have also obtained a much simpler machine to make and operate in other respects.

Referring to the drawings, Figure 1 is a side elevation of my machine. Fig. 2 is a perspective view of a lacing-hook such as this machine is designed to set. Fig. 3 is a top plan view of the hopper to contain the hooks and the track or raceway along which they pass to the setting mechanism. Fig. 4 is a top plan of the setting-tool. Fig. 5 is a vertical section of the same tool on line 5 5 of Fig. 4. Fig. 6 is a top plan on section-line 6 6 of Fig. 1. Fig. 7 is a top plan of a portion of Fig. 6, showing a portion of the setting mechanism in a different position. Fig. 8 is an enlarged sectional view of the stop or detent on sectional line 8 8 of Fig. 7. Fig. 9 is a front elevation of the raceway, showing the stop holding back the hooks. Fig. 10 is a longitudinal section showing the cam for throwing up the setting-tool. Fig. 11 is a longitudinal section showing the cam for operating the carrier-block and mechanism for placing the hook in position for setting. Fig. 12 is a detail section of carrier-block, showing eccentric for adjusting the travel of the carrier-block; and Fig. 13 is a top plan on sectional line 13 13 of Fig. 12.

The machine consists of a suitable frame-work or standard A, Fig. 1, having an upright head or bracket B, and in the front of this head is mounted the setting-die M, made adjustable vertically by the screw-threads and nuts M'. (See Fig. 1.) The shaft C (see Figs. 1 and 6) is driven by the pulley D, Fig. 6, and there are mounted upon it to be driven thereby the circular plates E and F, Fig. 6, each having grooved cams cut upon their respective surfaces, (see Figs. 10 and 11,) and also the beveled gear G, Fig. 6. This beveled gear G, by means of the other gear running into it and the shaft H, (see Figs. 1, 3, and 6,) operates the mechanism in the reservoir or hopper I, Fig. 3, for picking up the lacing-hooks and placing them upon the raceway J. The cam in the surface of plate F operates the lever L to throw up the setting-tool on the end of the spindle N, Figs. 1 and 10, and the cam in the plate E, Fig. 11, operates the carrier-block P, Fig. 6, as will be hereinafter more specifically described.

It will be understood by referring to Figs. 1 and 3 that the lacing-hooks in the reservoir I are brushed upon the end of the raceway J by the revolving brushes therein and slide down this raceway by gravity. It will be observed that these hooks are then in such a position that their shanks are up. The end of the track J is shown in Figs. 6 and 7. The hooks are arrested in their downward course by the spring-controlled stop or detent O, (see Figs. 6 and 7 and the enlarged views thereof in Figs. 8 and 9,) which is readily pushed down out of the way by the hook when moved by the mechanism carried by the carrier-block P. The setting-tool consists of the spindle N, with a groove across its end, and a plate N', arranged as a continuation of the raceway J, (see enlarged views, Figs. 4 and 5,) this plate N serving as an anvil upon which the hook is set when driven by the lever L against the setting-die M, Figs. 1 and 10, mounted in the head B. For placing the hooks one by one in position for setting the carrier-block P slides across the machine in slideways cut for it, as shown in Figs. 1, 6, 7, and 11. This plate P is given its motion by means of the sliding rod E', Fig. 6, which in turn is given motion by the grooved cam in the plate E. A connecting-rod E'' connects E' with the block P. A finger P', Figs. 1, 6,

and 7, is mounted in a couple of projections or brackets fastened to the block P, through which it can slide backward and forward. It is normally kept in the forward position (shown in the drawings) by the spring P'' coiled about it. In the rear end of this finger P' is a roller P^3, mounted to run on a vertical axis. Back of the block P is the elbow-arm R, fastened by the pivot-pin R' to the fixed bed or standard of the machine. This elbow is held in the normal position (shown in the drawings) by the spring R'' pressing its upper arm against the pin R^3 and carries upon its other arm a wedge-piece R^4, which is of such an elevation that it is in the path of the roller P^3 in the finger P' when the latter is carried laterally to the right by the carrier-block P.

The machine operates as follows: The hooks after being brushed upon the raceway J slide down by gravity until they come into contact with the stop or detent O. The carrier-block P is moved laterally to the right by the cam E and the connections between them, and the roller P^3 is thereby brought into contact with the wedge R^4 and by rolling upon its incline withdraws the finger P' against the spring P'', so that it will pass free of the hook resting against the stop O. The wedge R^4 is so proportioned that the roller P^3 reaches its right-hand end when the pointed end of the finger P' is back of the hook resting against the stop O, when the roller passes off the wedge R^4 and the finger is driven by the spring between that hook and the next one behind, the end of the finger being sharpened for this purpose. When the carrier-block P moves to the left, the finger P' carries the hook from the raceway onto the anvil N' of the spindle N, pressing it back of the spring N'', which serves to hold the hook in position, while the spindle later is driven upward. During this motion to the left of the carrier-block P the roller P^3 passes under the wedge R^4, thereby turning the elbow R, to which the wedge is attached, upon its pivot R' and permitting the finger P' to return to its first position. The two extreme positions of these parts are shown in Figs. 6 and 7. The movements of the two cams E and F are so timed that cam F will drive the spindle N upward and set the hook on the anvil N' at its top by driving it upon the setting-die M while the finger P' is out of the way and will return the spindle N to its lower position before the finger P' can push another hook so far forward as to come upon the anvil-piece N'. In practice the operator will hold the work in which the hook is to be set under the die M and the machine drive the hooks upward successively through the work and set them upon the die.

In Figs. 12 and 13 are shown a cam connection between the sliding rod E' and connecting-rod E'', whereby the position to which the finger P' will push the hooks can be accurately adjusted.

I claim as my invention—

1. In a machine for setting lacing-hooks, the combination of a track along which the hooks may slide, and a device for separating the hooks one from another and placing them in position for setting, consisting of a carrier-block and mechanism to move it, a finger mounted to slide bodily on said block transversely thereof, mechanism by which the finger is removed from the path of the hooks when the carrier-block is moved in one direction, and mechanism which places it in the path of the hooks to move them when the carrier-block is moved in the opposite direction.

2. In a machine for setting lacing-hooks, the combination of a track along which the hooks may slide, and a device for separating the hooks one from another and placing them in position for setting, consisting of a finger, mechanism for moving the finger to and fro laterally in a straight line, and mechanism by which the finger is removed from the path of the hooks upon the track when moved laterally in one direction and means whereby it is returned and held in their path to move them when moved in the other direction.

3. In a machine for setting lacing-hooks, the combination of a track along which the hooks may slide, and a device for separating the hooks one from another and placing them in position for setting, consisting of a reciprocatory carrier-block, a finger mounted to slide bodily transversely thereof and a spring to keep the finger normally in the path of the hooks, mechanism to slide the finger bodily laterally in a straight line, and a double cam mounted upon a pivoted swinging lever normally in the path of a portion of the finger and constructed to withdraw said finger from the path of the hooks when it is moved laterally in one direction and to be swung out of the way by the lateral movement of the finger in the opposite direction.

4. In a machine for setting lacing-hooks, the combination of a track along which the hooks may slide, and a device for separating the hooks one from another and placing them in position for setting, consisting of a finger, a spring to control the finger, mechanism to move the finger to and fro laterally, a swinging bell-crank lever, a spring acting on one arm thereof, a device mounted on the under side of the other arm of said lever, said last-mentioned spring placing the latter device in the path of a portion of the finger when the latter is moved laterally in one direction but which permits it to be swung out of the way when the finger moves laterally in the other direction.

5. In a machine for setting lacing-hooks, the combination with a track along which the

hooks may slide, and a device for separating the hooks one from another and placing them in position for setting, consisting of a reciprocatory carrier-block, a spring-actuated finger mounted to move in a straight line to traverse the block at right angles to the direction of travel of the latter, and means engaged by means on said finger for removing the finger from the path of the hooks when the carrier-block moves in one direction and means for placing it in the path of such hooks when the carrier-block is moved in the opposite direction, as set forth.

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Witnesses:
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A. N. WILLIS.