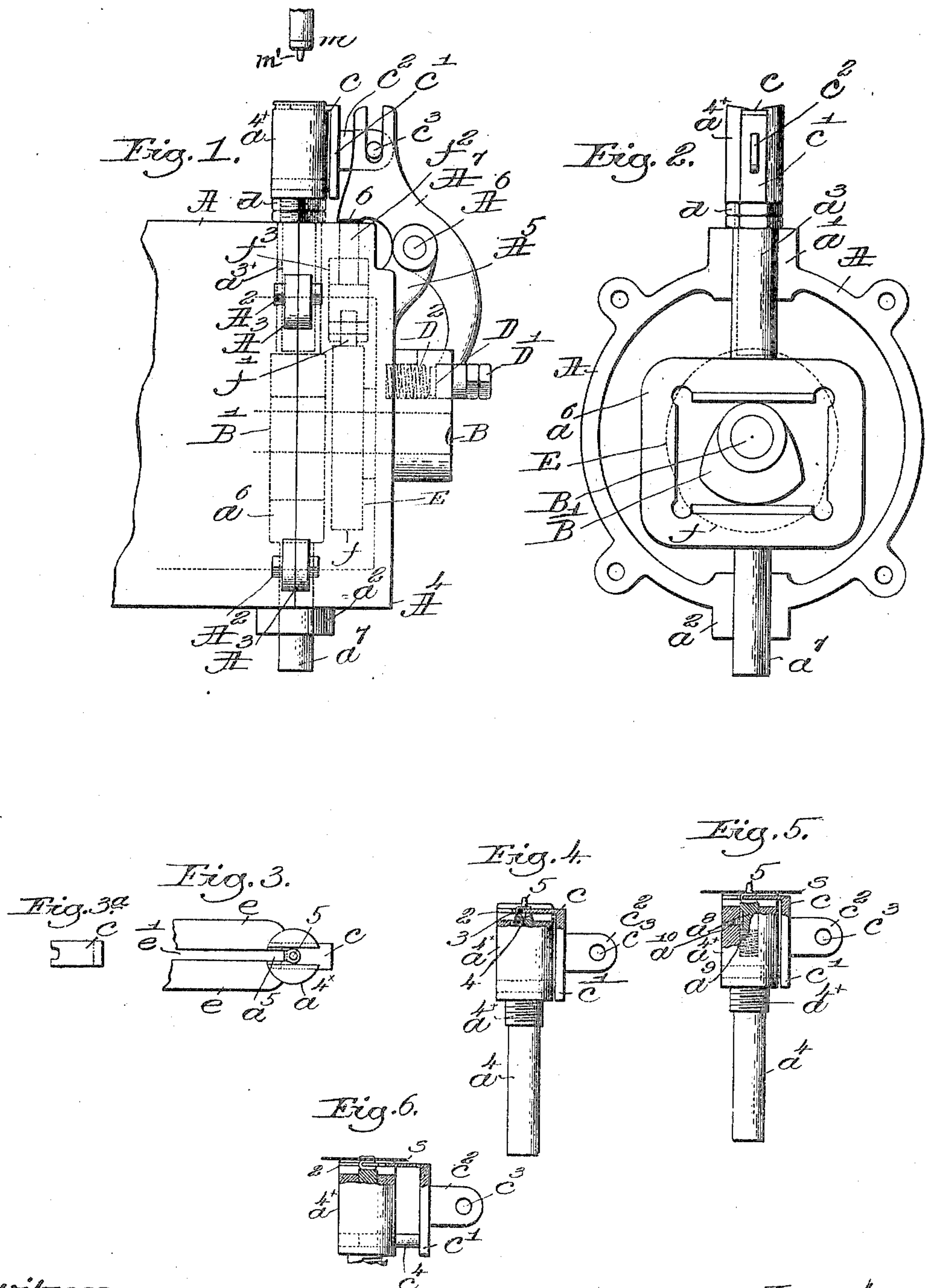


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P. R. GLASS.
MACHINE FOR INSERTING LACING STUDS.
APPLICATION FILED JUNE 29, 1903.



Witnesses:
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UNITED STATES PATENT OFFICE.

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MACHINE FOR INSERTING LACING-STUDS.

No. 811,838.

Specification of Letters Patent.

Patented Feb. 6, 1906.

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To all whom it may concern:

Be it known that I, PERLEY R. GLASS, a citizen of the United States, residing at Quincy, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Machines for Inserting Lacing-Studs, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object to provide a lacing-hook-setting machine of the class described in United States Patents Nos. 244,738 and 277,985, dated, respectively, July 7, 1881, and May 22, 1883, with novel means for sustaining the lacing-hook while being set in the stock, said means including a hook-sustaining plate loosely sustained by and guided by the head or upper end of a slotted plunger, means being provided for automatically moving said plate substantially at right angles to the longitudinal axis of said plunger after said hook has been set in the stock to thereby withdraw said plate from the throat of said lacing-hook.

The hooks to be set by the apparatus to be herein described will be supplied singly to the hook-sustaining plate from a raceway common to said patents; but instead of the throat of the hook embracing a fixed lip at the upper end of the plunger, from which lip the throat of the hook has to be removed by a workman after the shank of the hook has been set in the stock, the stock with the set hook being moved by the workman horizontally in a direction opposite the direction of movement of the hook when coming on the said fixed lip, I have provided a sliding frame with a plunger having at one end an enlarged head that receives and guides said hook-sustaining plate in its movements as stated, said plate when in its normal or hook-receiving position receiving upon it from the raceway the throat of the hook to be set and sustaining said hook while the latter is being set in the stock, said plate positioning the shank of the hook accurately with relation to the shank-clenching surface, which may be common to said patents, said hook-sustaining plate, after the hook has been set in the stock, being moved automatically transversely with relation to the longitudinal axis of the plunger to with-

draw the hook-sustaining plate from the throat of the set hook without any tendency whatever of the plate to stick in the throat of the hook or spring the top of the hook, as would be the case if the hook-sustainer were moved in the arc of a circle when being withdrawn from the throat of the hook.

The part of the plunger having the head and serving as a guide for and carrying the hook-sustaining plate is made adjustable in the sliding frame employed to reciprocate the plunger, so that when the plunger arrives in its lowered position the end of the hook-sustaining plate may be located accurately at the end of the raceway that the hooks leaving the raceway may pass therefrom and their throats embrace the end of said plate then occupying its inward normal or hook-sustaining position at right angles to the length of the raceway.

The plunger-head for guiding the hook-sustaining plate is grooved, and the groove is made as a continuation of the groove in the raceway, so that the hook may pass directly from the raceway-groove into the plunger-groove and straddle the free end of the sustaining-plate.

Herein the upper side of the hook-sustaining plate is located a little below the upper end of the head of the plunger in which the plate is guided, such provision being of advantage for the reason that it becomes possible to reduce the friction of the plate against the stock, and consequently the plate may be slid in the head and be withdrawn from the set hook while the higher side walls of the upper end of the plunger contact with the stock.

Figure 1, in left-hand side elevation, represents a sufficient portion of a hook-setting machine embodying my invention in one of the best forms now known to me. Fig. 2 is a right-hand view of Fig. 1 with the box shown in said figure at the right removed, together with the parts sustained thereby, the cam for moving the actuating-lever for the hook-sustaining plate being shown by dotted lines. Fig. 3 shows in plan view the upper side of the plunger and hook-sustaining plate slidably carried thereby, together with part of the usual raceway extension for supplying hooks to said plunger. Fig. 3^a shows a top

view of the hook-sustaining plate detached. Fig. 4 is a side elevation of the plunger and hook-sustaining plate, the latter engaging the hook, the upper end of the plunger being partially broken out and the plate being shown in longitudinal section. Fig. 5 is a similar view with the stock encircling the shank of the hook, and Fig. 6 is a similar view showing the tubular shank of the hook upset in the stock.

The tubular arm A will be supposed to be extended forwardly from a suitable framework, which may be such as shown in United States Patent No. 277,985, which also has an overhanging arm forming part of said frame that serves to sustain a bar, to the lower end of which is connected the member m or top set of the hook-setting means, the same being provided with a central depending projection m' to enter the tubular shank of the lacing-hook as the latter is being upset in the stock by contact with the member m . The framework of whatever shape will have suitable bearings to sustain a shaft B, that may be rotated in any usual manner, said shaft having a cam B' and a cam E, the latter having a lump f , to be described. A machine embodying my invention will be provided with usual plates e , (shown only in Fig. 3,) forming part of the lower end of a stud-guiding raceway or extension presenting a hook-guiding slot e' —such, for instance, as fully described in said Patent No. 277,985 and designated therein in the same manner.

I have provided the arm A with hubs a' and a^2 , forming bearings for the rods a^3 a^7 , extended oppositely from a yoke a^6 , said bars and yoke forming a sliding frame adapted to be reciprocated vertically by or from the cam B' on shaft B. The rod a^3 is hollow and receives the shank of the plunger a^4 , having at its upper end an enlarged head a^{4x} . The plunger has screw-threads upon which are applied adjusting-nuts d , (see Figs. 1 and 2,) change of position of which nuts on said screw-threads enables the hook-sustaining plate to be adjusted in the slide-frame that the hook-receiving end may be accurately located at exactly the proper position with relation to the end of the raceway and the groove e' therein, from which the lacing-hooks pass on their way to embrace the edge of the hook-sustaining plate, the groove in the upper end of the plunger and in the raceway at such times coinciding. The shank of the plunger is held in adjusted position in the hollow rod a^3 by means of a small screw a^{3x} . (Shown in Fig. 1.) The head a^{4x} of the plunger is bored to receive a retainer a^8 , (shown as a rod,) the upper end of which is cupped to embrace the head 4 of the lacing-hook to be set. The retainer rests on a spring a^9 , and a screw a^{10} , inserted through a hole in the head, enters a notch in the side of the retainer and prevents the latter from being projected too

far. The retainer a^8 acts frictionally to prevent the hook escaping from the end of the hook-sustaining plate as the latter is elevated by the plunger to set a hook in stock.

The upper end or head of the plunger is recessed to receive the head of the lacing-hook to be set as the hook leaves the groove of the raceway, and said recess is shown wider than the space e' between the raceway-plates e , the width of the recess being slightly in excess of the width of the head of the lacing-hook, as shown best in Fig. 3.

The upper end of the plunger carries the hook-sustaining plate c , which is slidably connected with and guided by said plunger, so that it stands normally in hook-receiving position, said plate having coacting with it means to be described to move the same transversely or at right angles to the longitudinal axis of the plunger after a hook has been set to withdraw the plate from the set hook, as will be described, the said hooks being set by a movement of the plunger and plate toward the clenching member to be described. As herein represented, the side walls of the recess in the upper end of the plunger are grooved, as shown by dotted lines, Fig. 3, to receive and direct the side edges of the hook-sustaining plate as the latter is moved transversely of the plunger, as described, and, as best shown in Figs. 1 and 2, the upper side of the hook-sustaining plate is located below the upper end of the head a^{4x} , which enables the plate to be withdrawn from the throat of a set hook with less friction on the stock than would be the case if the top of the plate were flush with or occupied a position above the upper end of the head of the plunger. The end of the sustaining-plate is notched, as shown in Fig. 3^a, to receive the neck 3 of the lacing-stud, as shown in Fig. 4. The plate c has a depending leg c' , from which extends an ear c^2 , provided with a stud c^3 . Said leg also has extended from it a stud c^4 , that enters a suitable hole in the head a^{4x} of the plunger and guides the hook-sustaining plate in its transverse movements thereover or at right angles to the longitudinal axis of the plunger. The recessed portion a^5 of the upper part of the plunger also serves to guide the plate c in its sliding movement at right angles to the axis of the plunger.

The front end of the arm A has attached thereto, as by bolts A^2 in ears A^3 , the box A^4 , having concavities at its inner side to fit the rods a^3 and a^7 and form bearings for the same as the slide-frame carrying the plunger is reciprocated. The box A^4 is provided with a stand A^5 , upon which is pivoted at A^6 a hook-plate-moving device (shown as a lever A^7) that is loosely connected with the hook-sustaining plate by the slotted upper end of said lever embracing the stud c^3 . The lower end of the lever A^7 has a plug D, controlled as to

its position by a suitable set-nut D' , the inner end of said plug meeting and being acted upon by a spring D^2 , sustained in a suitable pocket and abutting said plug at its opposite end.

5 The spring D^2 acts normally on said plug to turn the lever A^7 in such direction as to retain the hook-sustaining plate c in the position shown in Figs. 1, 3, 4, and 5, that the throat of the lacing-hook as the latter leaves

10 the groove e' may immediately embrace and take seat on the end of said sustaining-plate, the latter, under control of the lever A^7 and spring D^2 , being held in such position as to present the shank of the hook carried by

15 said plate in line with the depending central portion m' of the top set m . The lever A^7 is turned to move the guided hook-sustaining plate at the end of the plunger to place the same in its normal or hook-receiving position

20 and to withdraw the plate from the throat of the hook after the latter has been set in the stock by or through the lump f of cam E on a roller f' of a rod f^2 , lifting said rod to meet a projection 6 of said lever and turning the upper end thereof outwardly against the stress

25 of the spring D^2 .

The sustaining-plate shown is withdrawn positively from the throat of the hook while the plunger occupies its elevated position and

30 immediately after the tubular shank of the hook has been upset in the stock by raising the plunger. The stock is preferably provided with holes which are applied one after the other by the operator holding the stock

35 in his hand over the point m' of the upper set m , it having a clenching-shoulder surrounding the point m' .

The thickness of the hook-sustaining plate is a little less than the space between the under side of the head of the hook and that portion thereof from which the hollow shank

40 extends, so that the plate enters and fills the throat of the hook, and it is essential for the successful operation of the hook-setting parts that the sustaining-plate be so sustained and

45 guided by the plunger that said plate may be moved or slid at the end thereof transversely or substantially at right angles to the longitudinal axis of the plunger when said plate is

50 to be withdrawn from the throat of the set hook, for thereby all tendency of the plate to stick and bind in the throat of the hook is obviated and the plate has no tendency whatever to pry up the head of the stud from that

55 portion thereof which is set in the stock, and so enlarge the throat.

Fig. 6 shows the hook-sustaining plate retracted, as it will be immediately after the shank of the hook has been set in the stock.

60 From the foregoing description it will be understood that the spring D^2 acts normally to move the hook-sustaining plate transversely of the longitudinal axis of the plunger A^4 into its normal or hook-receiving position, as represented in Fig. 3, placing the receiving

end of said plate in such relation to the end of the groove e' of the raceway that the throat of each lacing-hook as it leaves said groove will straddle immediately the end of the plate, the neck of the hook entering the notch of

70 the plate and the head of the hook entering the recess at the upper end of the plunger. After a hook has been supplied to the sustaining-plate the latter remains in its normal or hook-receiving position with relation to

75 the plunger while the plunger is raised that the top set may enter and expand or upset the shank of the hook. When the hook has been set in the stock, the cam E acts through the rod f^2 to turn the lever A^7 and slide the

80 hook-sustaining plate transversely or at right angles to the longitudinal axis of the plunger, thus withdrawing said plate from the throat of the hook which has been set in the stock, and immediately thereafter the plunger de-

85 scends, the head of the hook escaping through the wider recess in the top of the plunger, said recess being wide enough to permit the escape of the hook set in the stock by a relatively vertical movement of the plunger

90 rather than by a horizontal movement of the hook and stock with relation to the longitudinal axis of the plunger.

Prior to my invention I am not aware that the plunger of a machine for setting lacing-

95 hooks has ever been provided with a guided hook-sustaining plate slidable automatically transversely or at right angles to the longitudinal axis of the plunger to thereby withdraw said plate from the throat of the set hook

100 without bending the head thereof, thus releasing the hook preparatory to the descent of the plunger to take a new hook, and consequently I do not intend to limit my invention to the exact shape shown for said hook-sustaining plate nor to the exact means shown

105 for sustaining, guiding, or sliding the same transversely of the longitudinal axis of the plunger to thus free the set hook.

Having described my invention, what I

110 claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the class described, a clenching member, a plunger, a hook-sustaining plate carried by said plunger, means to

115 supply said hook-sustaining plate with hooks when the plunger occupies one of its extreme positions, means to move the plunger after supplying said plate with a hook, and means to slide said plate transversely with relation

120 to the longitudinal axis of said plunger, to withdraw the plate from a set hook before the return of the plunger to its starting-point.

2. In a machine of the class described, a movable plunger grooved at its end, a hook-

125 sustaining plate carried by said plunger and having its upper side located in a plane below the upper end of said plunger, and means to slide said plate transversely with relation to the longitudinal axis of said plunger to with-

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draw the same from the throat of a set hook while the upper end of the plunger contacts with the stock in which the hook has been set.

3. In a machine of the class described, a plunger, means to raise and lower the same, a hook-sustaining plate mounted at the end of and guided by said plunger, a lever in operative engagement with said plate at both extreme positions of the plunger, and means to move said lever to slide said plate transversely to said plunger at the end thereof to withdraw said plate from a set hook.

4. In a machine of the class described, a plunger, a hook-sustaining plate guided by said plunger and located at one end thereof, and means controlled by a spring to maintain the end of said plate in normal position to receive the throat of a hook.

5. In a machine of the class described, a plunger, means to reciprocate said plunger, a hook-sustaining plate guided at the end thereof, and means coacting with said plate to move the same transversely with relation to the longitudinal axis of said plunger to withdraw said plate from the throat of a set hook.

6. In a machine of the class described, the combination with a plunger, of a hook-sustaining plate, a lever, and a spring to move it to cause said plate to enter the throat of a lacing-hook, and a continuously-moving actuator to act upon said lever after setting the hook to withdraw said sustaining-plate from the throat of the hook.

7. In a machine of the class described, a raceway, a clenching device, a plunger having a guideway, a hook-sustaining plate slidably mounted at the end of said plunger, and means to slide automatically said plate controlled in its direction of movement by said guideway, the plate being moved transversely to the longitudinal axis of said plunger.

8. In a machine of the class described, a plunger, a hook-sustaining plate located at the end thereof and notched at its edge to receive the neck of the hook as the throat of the hook to be set comes onto the edge of said plate, and means to slide automatically said plate at right angles to the longitudinal axis of said plunger to withdraw said plate from the throat of the hook after the latter has been set in the stock.

9. In a machine for setting lacing-hooks, a plunger having a recess at its upper end to receive the head of a hook, said recess being wider than the width of the head of the hook to be set, a hook-sustaining plate slidably sustained by said plunger and having its hook-receiving edge in and crossing said groove, said plate having a notch in its edge to receive the neck of the hook as the latter comes into setting position on said plate, and means to automatically move said plate outwardly in said plunger to withdraw the plate

from the throat of the hook after the same has been set in the stock that the hook and plunger may be separated one from the other.

10. In a machine of the class described, a raceway, a clenching device, a plunger having its upper end recessed to form a space for the reception of the head of a lacing-hook, a slidable hook-sustaining plate sustained at the upper end of said plunger, the end of said plate being adapted to be embraced by the throat of the hook to be set, means to actuate said parts to effect the thrusting of the shank of the hook through the stock that the clenching device may expand the shank of the hook, and means to move said plate in said plunger at right angles to the longitudinal axis thereof to withdraw said plate from the throat of said hook preparatory to lowering the plunger.

11. In a hook-setting machine, a plunger having a horizontal guideway and a hook-receiving space, and a hole for a guide-rod, combined with a hook-sustaining plate located in said guideway, and provided with a guide-rod entering the hole of said plunger.

12. In a hook-setting machine, a plunger and a carrying member therefor, means to adjust the plunger on the carrying member, a hook-sustaining plate carried by said plunger, and means to move said plate substantially at right angles to the longitudinal axis of said plunger to withdraw said plate from a set hook.

13. In a hook-setting machine, a plunger, means to move the same longitudinally, a hook-sustaining plate guided in the upper portion of said plunger, a lever mounted on the framework of the machine, said lever being loosely connected at its upper end with said hook-sustaining plate, and means to move said lever to withdraw the hook-sustaining plate from the throat of the set hook.

14. In a machine of the class described, a raceway, a plunger, means for carrying said plunger, means for adjusting said plunger on said carrying means, means for holding said plunger in its adjusted position in said carrying means, a hook-sustaining plate guided at the end of said plunger and adapted to receive a hook from said raceway, a clenching device to set in stock the shank of a hook held by said plate, and means to thereafter slide said plate transversely to the longitudinal axis of said plunger to withdraw said plate from the throat of the set hook.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PERLEY R. GLASS.

Witnesses:

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EDITH M. STODDARD.