

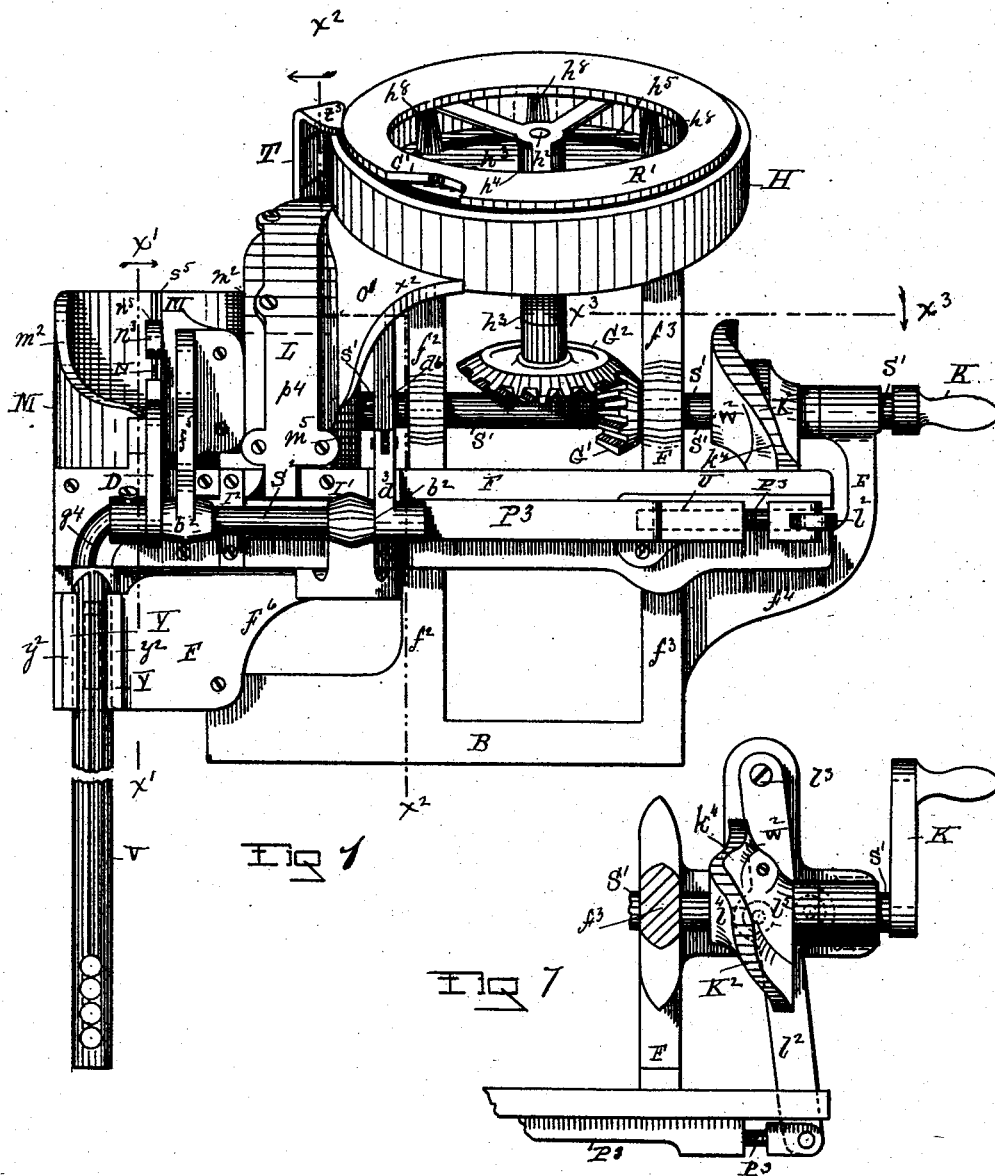
(No Model.)

4 Sheets—Sheet 1.

A. W. HAM.  
MACHINE FOR THREADING BUTTON FASTENERS INTO THE  
EYES OF BUTTONS.

No. 491,103.

Patented Feb. 7, 1893.



WITNESSES

*William A. Sweet*

*Abner S. Brintnall*

INVENTOR

*Albert W. Ham*

*by W. C. Hagan atty*

(No Model.)

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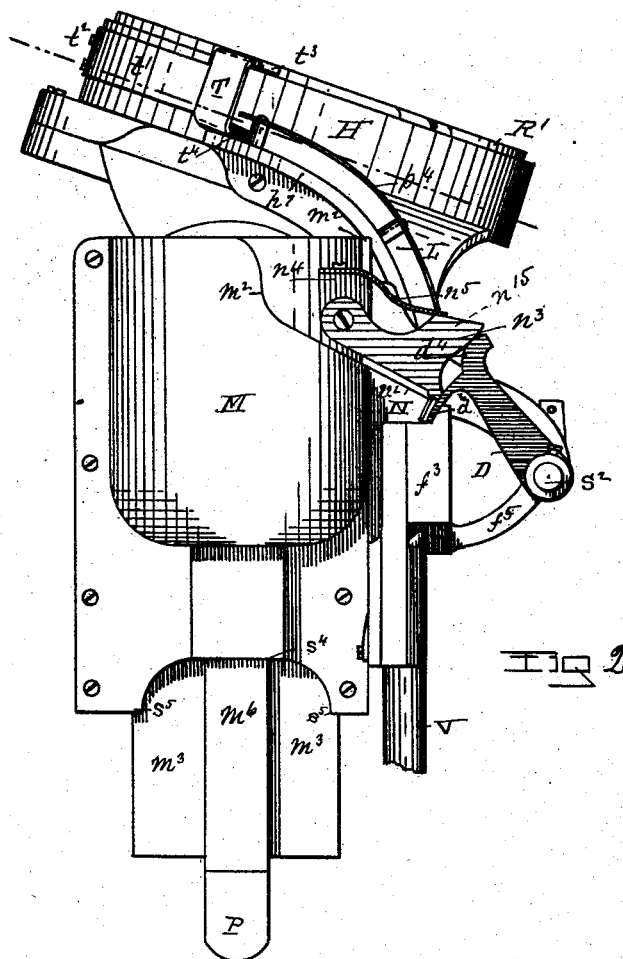


FIG 2

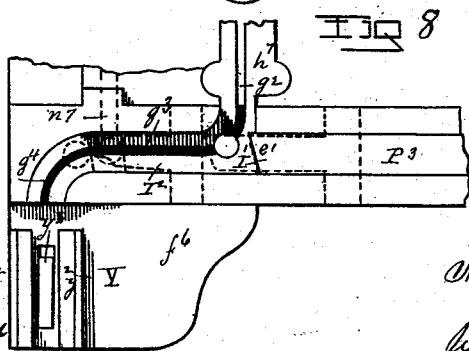


FIG 8

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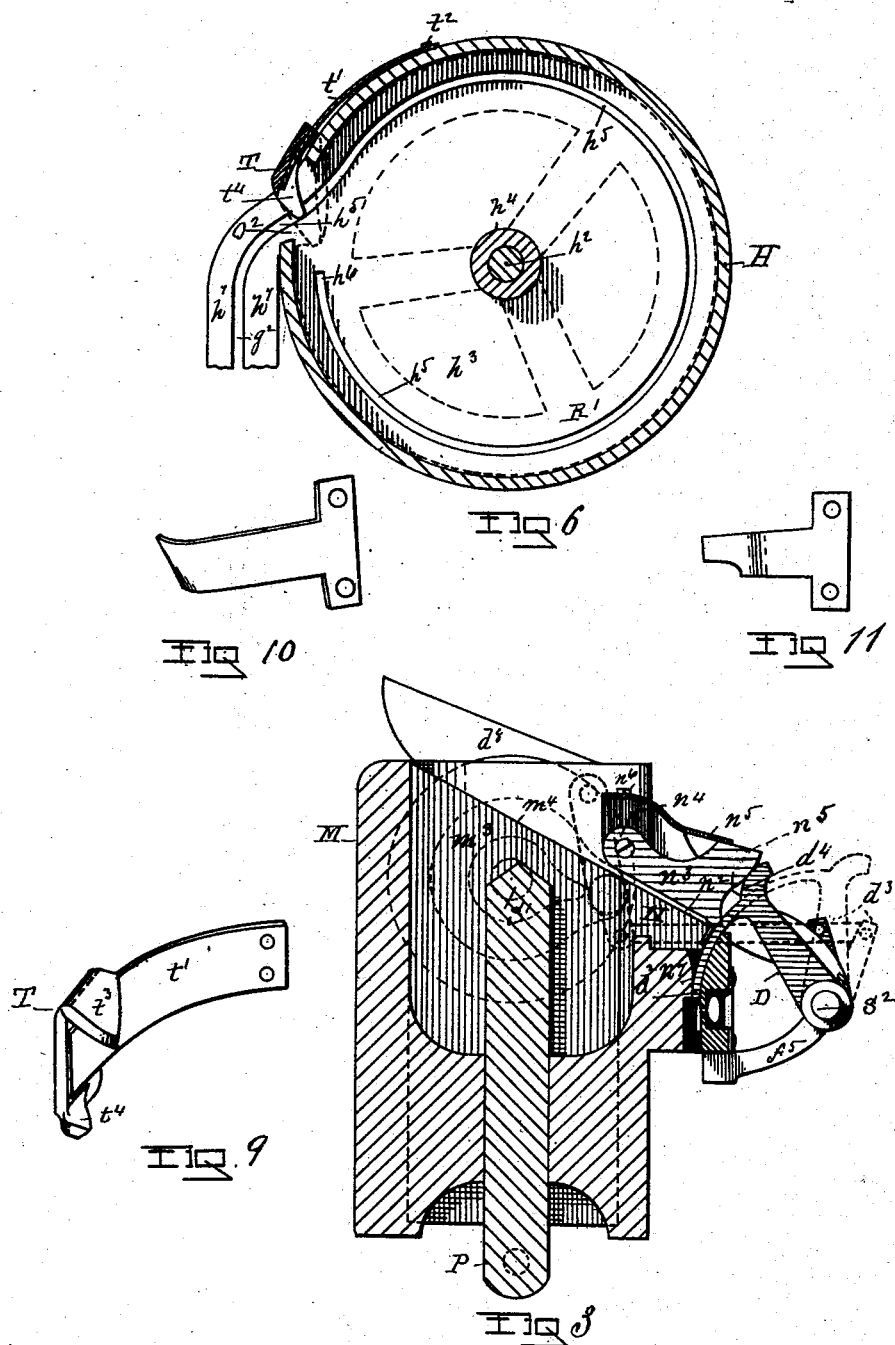
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FIG 4

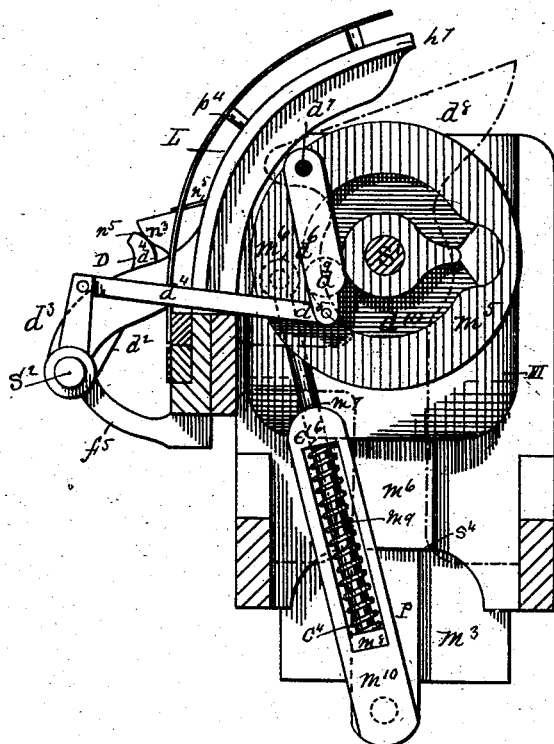
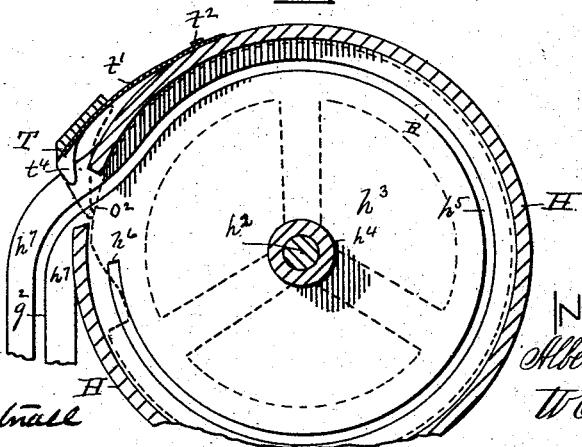


FIG 5



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# UNITED STATES PATENT OFFICE.

ALBERT W. HAM, OF LANSINGBURG, ASSIGNOR TO THE TROJAN BUTTON FASTENER COMPANY, INCORPORATED, OF TROY, NEW YORK.

MACHINE FOR THREADING BUTTON-FASTENERS INTO THE EYES OF BUTTONS.

SPECIFICATION forming part of Letters Patent No. 491,103, dated February 7, 1893.

Application filed March 21, 1892. Serial No. 425,691. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT W. HAM, of the village of Lansingburg, county of Rensselaer, State of New York, have invented new and useful Improvements in Machines for Threading Button-Fasteners into the Eyes of Buttons, of which the following is a specification.

My invention relates to improvements upon that class of machines that are used to thread button fasteners into the eyes of buttons and to place the buttons and fasteners so connected within a slotted tube, that is when filled with buttons and fasteners so connected, attached to a button setting machine; and which class of machines are termed tube-loaders.

It is the object and purpose of my invention to better adapt this class of machines to the uses for which they are designed.

Accompanying this specification to form a part of it there are four plates of drawings containing eleven figures illustrating my invention with the same designation of parts by letter reference used in all of them.

Of these illustrations Figure 1, is a side elevation of a tube-loading machine containing my invention, with that side on which the button receiving tube is located facing the view. Fig. 2, is an end view with that end of the machine in which the button-fastener hopper is located facing the view. Fig. 3, is a section taken on the line  $x'$ ,  $x'$ , of Fig. 1. Fig. 4, is a section taken on the line  $x^2$ ,  $x^2$ , of Fig. 1. Fig. 5, is a transverse section taken through the button hopper with the button striker shown as forced away from the button passage-way made in the hopper side. Fig. 6, illustrates the same parts that are shown in Fig. 5, but showing the button striker as forced within the button passage in the side of the button hopper. Fig. 7, is a transverse section taken on the line  $x^3$ ,  $x^3$ , of Fig. 1. Fig. 8, is a side elevation of the slot in which the buttons are held while fasteners are being threaded into the eyes thereof with all those parts in front of said slot removed. Fig. 9, is a perspective of the button striker illustrated as removed from the machine. Fig. 10, shows as detached from the machine a T-form leaf spring which when in position holds the descending button in position until

acted upon by the plunger which moves it toward the tube, and Fig. 11, shows as detached from the machine a T-form spring that holds each button in position in the slot while a staple or fastener is being threaded into the eye thereof.

The several parts of the mechanism thus described illustrated are designated by letter reference and the function of the parts is described as follows.

The letter B, designates the base or support on which the machine rests, and F, its frame with which the mechanism connects. This frame consists of the studs  $f^2$ ,  $f^3$ , projected upwardly from the base, a curved upcast arm  $f^4$ , and lateral frame extensions  $f^5$ ,  $f^6$ .

The letter H, designates the button-hopper which is positioned on an incline with one side lower than the other, and is connected to the upcast arms  $f^3$  and  $f^2$ , by means of an offset arm  $O'$ , projected from the latter. This hopper is made with a revolving brush-ring  $R'$ , arranged at its top, and this ring has radially arranged and interiorly placed arms that connect it centrally to a shaft  $h^2$ , that is also inclined enough from a perpendicular to be at right angles to the hopper bottom  $h^3$ . This shaft journals in a sleeve form bearing  $h^4$ , that is downwardly projected through the hopper bottom.

The letter  $h^5$ , designates a button receiving slot that is circularly arranged in the hopper bottom a short distance from its outer edge. This slot has one closed end  $h^6$ , and at its other end it curves outwardly so as to pass through an opening  $O^3$ , made in the button hopper side and thereat to connect with a slot made in the plate  $h^7$ , from and through which the buttons descend to where the staples are threaded into the eyes thereof, as will be subsequently described therein.

The letters  $h^8$ , designate brushes that are downwardly projected from the underside of the ring  $R'$ , near its outer edge.

The letter  $S'$ , designates a driving shaft, and this shaft has its journal bearings in the frame-parts  $f^2$ ,  $f^3$ .

The letter  $G'$ , designates a beveled gear-wheel on the shaft  $S'$ , and the letter  $G^2$ , designates a beveled gear-wheel on the shaft  $h^2$ , adapted to mesh into the gear-wheel  $G'$ .

The letter K, designates a crank on the outer end of the shaft S', for operating the latter. When the ring R', thus constructed and connected is operated to turn, the buttons within the hopper are moved around by the brushes so that some of them will have their shanks within the slot  $h^5$ , and such as take this position will be moved around through and out of the slot in the hopper bottom so as to pass out of the side of the latter into a connected slot from whence they pass to where the staples are threaded into the eyes thereof.

The letter T, designates a button striker which connects with the circular exterior side of the button hopper by means of a leaf-spring  $t'$ , at  $t^2$ . This striker has a cam-form lip  $t^3$ , at its upper free-end, and a striker blade  $t^4$  at its lower free-end. The ring R', is made with a cam C', cut into its rim, and when the ring is revolving the lip of the striker is held in contact with the outside of said ring until the cam C', comes opposite to the end of the striker, when the latter is by the spring  $t'$ , forced inwardly so as to enter the opening O<sup>2</sup>, and to strike the button thereat within the slot  $h^5$ , and knock it out of the slot. The uses of the striker thus constructed and arranged to operate is to prevent buttons that are crowded into the slot by some one of them being improperly positioned therein from remaining there, so that their passage is obstructed, and thus clearing away the button at the point where the slot in the hopper bottom curves to pass from the hopper at each revolution of the ring R', to keep the slot free; there always being enough buttons in position within the slot so that the removal of one of them at each revolution of the ring does not interfere with the proper working of the machine and avoids a difficulty common to machines of this kind.

The letter M designates the staple or fastener hopper which is attached to the lateral extension of the frame-part  $f^6$ . This staple or fastener hopper is elliptical in transverse section, and is cut away on one side and front as indicated at  $m^2$ , Figs. 1 and 2.

The letter  $m^3$ , designates a blade having a downwardly and frontwardly inclined upper edge  $m^4$ , and this blade is connected at its lower end where below the hopper with a plunger P, and this blade is made with a slide-way in the hopper sides and extending below the hopper as indicated at  $s^5$ , and this plunger is operated to be vertically reciprocated so as to move the blade up and down within the hopper by means of a connecting rod  $m^{10}$ , which is pivoted at its lower end to the said plunger, and at its upper end connects with the wheel  $m^5$ , by means of a crank-pin  $m^6$  as shown at Fig. 4. This wheel  $m^5$ , is arranged on and secured to the shaft S', and receives power therefrom, and by which the plunger P, and connected blade  $m^3$ , are vertically reciprocated within the hopper M.

The letter  $m^6$ , designates a tumbler which

is projected up through the hopper bottom so as to straddle and be upon both sides of the blade  $m^3$ , one of its sides being shown at Fig. 2, and the other at Fig. 4; its construction upon each side of the blade being the same; and it is provided with a slide-way  $s^4$ , in the hopper bottom. The function of this tumbler is to change the position of the fasteners at each vertical reciprocation of the blade and tumbler and thus facilitate the capacity of the blade to catch the fasteners, which if the blade alone were used would tend to position themselves with their bend ends downward in which position they would not be so readily caught by the blade.

The connecting-rod  $m^{10}$ , is made in two parts and arranged to operate elastically in its engagement with the plunger P, by the following construction.

The letter C<sup>4</sup>, designates a chamber formed within the rod proper said chamber containing a spiral spring  $m^9$ , arranged to therein encircle the supplemental part of the connecting rod with its lower end provided with a collar  $m^8$ , where within the chamber; and the upper end where extending through the end of the chamber provided with a slide-way C<sup>6</sup>, and at its upper end connecting with the crank-pin on the wheel  $m^5$ , with the connecting rod proper at its lower end pivotally connecting with the plunger P.

The style of button fasteners to which my improvements herein shown are adapted to use have a U-form and as the blade  $m^3$ , is reciprocated within the hopper M, the fasteners are fished out by the blade so as to straddle the inclined upper edge of the latter, and to slide down on to the inclined top edge of the vertically placed plate N, which is in vertical alignment with the blade, and having its top edge with the same inclination as the latter; so that fasteners or staples will in their descent from one pass on to the inclined top edge of the other. The top edge of the plate N, is indicated at  $n^2$ . The letter  $n^3$ , designates a detaining-plate that at  $n^4$ , is pivoted to a plate on the edge of the hopper M, where cut away at  $m^2$ , and the letter  $n^5$ , designates a leaf-spring which at its upper end  $n^6$ , is attached to the same plate as that to which the detaining plate is pivoted; with the lower free end of said spring resting on the top edge of the detaining plate. When the latter is forced down by gravity and the spring  $n^5$ , the lower edge of said plate is in parallel alignment with the top edge of the plate N, where it detains all the fasteners thereon excepting the bottom one which is free to descend shank-end foremost into and through the passage-way  $n^7$ , as shown at Fig. 3. This detaining plate  $n^3$ , is made with a cam surface  $n^5$ , on its edge the function of which will be described in connection with the operation of the threading finger.

The letter D, designates an arm that is made with a threading finger-part  $d^2$ , adapted to be moved back and forth in the passage-

way  $n^7$ ; and this arm is made with a cam  $d^4$ , on its rear edge, and at its lower end is connected so as to be moved by the shaft  $S^2$ , so that the curved threading finger will pass into and from out the curved passage-way  $n^7$ .

When the threading finger is moved downwardly the cam  $d^4$ , on the arm D, engages with the cam  $n^5$ , on the outer edge of the detaining-plate  $n^3$ , so as to move the latter away from its staple holding engagement with the staples astride of the plate N, and allows the staples to slide down on the latter to stop against the edge of the threading finger when the latter has descended into the passage-way  $n^7$ ; and when the threading finger has completed the work of threading a staple into the eye of a button and rises from out of the passage way  $n^7$ , it releases the detaining-plate which by gravity and its spring is forced down on top of the staples astride of the plate N; to hold all but the one at the lower end of the plate, which is free to descend into the passage-way  $n^7$ , prongs downward to be forced into the eye of a button at a succeeding descent of the threading finger.

The arm D, and its finger  $d^2$ , are arranged on the shaft  $S^2$ , to be moved by the latter intermittently, and reciprocatingly by a connection made with the wheel  $m^5$ , on the shaft  $S'$ , and by the following mechanism. The letter  $d^3$ , designates a crank-arm on the shaft  $S^2$ , with the latter having its bearings at  $b^2$ , and this crank-arm pivotally connects with a pitman  $d^4$ , which at its inner end is pivoted at  $d^5$ , to a cam-pin arm  $d^6$ , which latter at its upper end  $d^7$ , is pivoted to an offset  $d^8$ , made from the frame and the letter  $d^9$ , designates a cam-pin on the lower end of the arm  $d^6$ , which pin is arranged to run in a cam groove  $d^{10}$ , made in that face of the wheel  $m^5$ , which is opposite to that on which the connecting rod  $m^4$ , of the plunger P connects to said wheel, as shown at Fig. 4. As thus connected with the wheel  $m^5$ , on the shaft  $S'$ , at each revolution of the latter the threading finger is operated to descend into the fastener passage  $n^7$ , to thread a fastener into the eye of a button and the arm D, is operated to so move the detaining plate as to allow a single staple to descend into the staple passage-way as before described. The buttons after being forced from out of the button hopper enter a continuation of the same slot connecting with the one in the bottom of the latter which continuation is produced in the plate  $h^2$ , and from which they pass into the slot  $g^2$ , made in the chute L. This latter is formed by the slotted plate  $h^7$ , and the cover-plate  $p^4$ , as shown at Figs. 4, 5, and 6. This chute L, curves outwardly and downwardly and with its button slot curves laterally to connect by a bend therein with a horizontal slot-part  $g^3$ . The buttons pass downwardly in the slot-part  $g^2$  by gravity and are kept from falling out by the cover plate  $p^4$ . Soon as the button in advance has passed into the entrance of the horizontal slot-part  $g^3$ , of the chute L, its fur-

ther movement is arrested by the T-form spring I, which at its secured end straddles the slide-way of the button plunger  $P^3$ , for attachment while its free end  $e^3$ , is made to bend slightly inwardly (as shown at Fig. 10) so as to engage with the button entering the horizontal slot-part  $g^3$ , and hold it until moved outwardly by the button plunger, to where it is acted upon by the T-form spring  $I^2$ , and held in a position opposite to the bottom of the staple passage-way  $n^7$ , and where the threading finger  $d^2$ , will guide a fastener so as to have one of its prongs enter the eye in the button shank. While the fastener or staple is being threaded into the button eye the plunger  $P^3$ , rests momentarily, and then moves the button and inthreaded fastener through the horizontal slot-part  $g^3$ , beyond the staple or fastener passage  $n^7$ , and from under the action of the spring  $I^2$ , so as to prevent two fasteners from being threaded into the same button eye should another button not come into position at the bottom of the fastener passage, before the threading finger again descends. After being moved out in the horizontal part of the slot  $g^3$ , beyond the bottom of the fastener passage by the plunger, the buttons crowd one another on until they reach the bend connecting the horizontal slot part with the slot part  $g^4$ , when they enter the slot in the button tube V, where they are retained by the fasteners, from falling out the slot. The button plunger  $P^3$ , is made with a slide-way U, attached to the side of the frame, and when moved therein toward the bottom of the fastener-passage-way  $n^7$ , it passes in front of the slot  $g^3$  so as to engage with the side of each button therein to move it. This plunger is operated by a lever  $l^2$ , that at its outer end  $l^3$ , is pivoted to the frame of the machine as shown in a top view at Fig. 7, and at its other end this lever is pivotally connected with the plunger  $P^3$ . The letters  $l^4$ , and  $l^5$ , designate cam-pins having friction rollers and vertically placed each in an ear formed on the opposite sides of the lever  $l^2$ . The letter  $W^2$ , designates a wheel secured so as to turn with the shaft  $S'$ , and the letter  $K^2$ , a cam formed in said wheel on its perimeter adapted to engage with the cam-pins on the lever  $l^2$ , and by its pivotal connection made with the plunger  $P^3$ , to operate the latter to make one reciprocation at each revolution of the shaft and to pause when moving progressively before reaching the full extent of its progressive movement, when the narrow part of the cam  $K^2$ , as indicated at  $k^4$ , is passing between the cam-pins. The blade  $m^3$ , is made to move elastically by means of a spring in the rod or pitman connecting it with the wheel that actuates it for the following purposes. When the blade has reached the limit of its upper movement it is desirable that it should pause or rest in its movement before descending a sufficient length of time to have the fasteners slide from its inclined edge on to the edge of the plate N and by

having the connecting rod made in two parts with an intermediate spring this result is accomplished. The letter Y, designates the button tube socket which is made with the side socket-parts  $y^2$ ,  $y^3$ , and a spring  $y^3$ , the latter being placed within the socket so as to force the button tube V, against the socket parts to grasp and hold it in position as shown at Figs. 1, and 8.

I am aware that a button hopper made with a slot in its bottom and provided with a side aperture through which the slot leads; and having also a ring made with brushes on its under face actuated to be rotated in the hopper so as to position buttons with their shanks in the slot of the hopper bottom and to move them so placed into a slot outside of the button hopper is an old and well known construction and I make no claim to the same apart from the button striker that I combine therewith.

I am also aware that a fastener hopper made with a blade adapted to be vertically reciprocated therein and having an inclined upper edge is an old and well known construction and I make no claim to the same apart from the improvements in its construction which are illustrated and set forth herein

Having thus described my invention what I claim and desire to secure by Letters Patent is

1. In a mechanism for threading fasteners into the eyes of shank-buttons, said mechanism having a circular button hopper that is constructed with a button slot in its bottom near its outer edge, and made with a side passage way through which said slot leads, and provided with a rotating ring having brushes on its under face, substantially as described; of a button-striker operated by a spring on the hopper exterior and a cam on the said rotating ring, to enter and recede from the side passage of the button hopper substantially in the manner as and for the purposes set forth.

2. The combination with the hopper H, made with the side opening  $O^2$ , button slot  $h^5$ , the rotating ring  $R'$ , the latter having brushes  $h^8$ , and a cam  $C'$ ; of the button striker T, having the leaf-spring  $t'$ , at one of its ends attached to the hopper exterior and at its other end made with the cam-lip  $t^3$ , and striker  $t^4$  constructed and arranged to operate substantially in the manner as and for the purposes set forth.

3. The combination with a button fastener hopper of a blade having a downwardly inclined upper edge, and provided with a slide-way in the hopper bottom; a plunger connected with the bottom of said blade; and a connecting rod provided with an interior spring by which said connecting rod makes an elastic connection with an operating wheel and said plunger, substantially in the manner as and for the purposes set forth.

4. The combination with the fastener hopper M, made with the cut away part  $m^2$ , and

having the blade  $m^3$ , made with an inclined upper edge, and adapted to be vertically reciprocated within said hopper; of the plate N, arranged to be in vertical alignment with said blade, and having an inclined upper edge; the pivoted detaining plate  $n^3$ , provided with a spring  $n^5$ , and cam  $n^5$ ; the arm D, made with the cam  $d^4$ , threading finger  $d^2$ , and the down-curved fastener passage-way  $n^7$ , constructed and arranged to be operated substantially in the manner as and for the purposes set forth.

5. The combination with the button-chute L, made with the button slot  $g^2$ , which at its upper end connects with a button hopper and is made with a cover-part  $p^4$ , the horizontal slot-part  $g^3$ , and the down-curved slot-part  $g^4$ ; of the curved fastener passage-way  $n^7$ , adapted to receive fasteners at its upper end, and at its lower end connect with said horizontal slot-part; the pivoted arm D, made with the threading finger  $d^2$ , adapted to be reciprocated within said fastener passage-way; the springs  $I'$  and  $I^2$ , arranged to face on the said horizontal slot-part; and the plunger  $P^3$ , adapted to be reciprocated so as to engage with and move buttons in said horizontal slot-part substantially in the manner as and for the purposes set forth.

6. The combination with the horizontal slot-part  $g^3$ , adapted to receive buttons substantially as described; of the fastener passage-way  $n^7$ , which at its lower end terminates in the horizontal slot-part, and adapted to receive fasteners at its upper end, and provided with a threading finger; and the leaf-spring  $I^2$ , arranged opposite the connection made between the said fastener passage-way and horizontal slot-part substantially in the manner as and for the purposes set forth.

7. In a machine for threading fasteners into the eyes of shank buttons, the combination of a button chute containing a slot, having a downwardly curved part and a horizontal part; a fastener passage-way having its lower end connecting with said horizontal slot-part, and provided with a fastener threading finger; a button detaining spring at the junction of the horizontal slot-part and fastener passage-way; and a plunger substantially in the manner as and for the purposes set forth.

8. The combination with the horizontal slot-part  $g^3$ , of the spring  $I^2$ ; the fastener passage-way  $n^7$ , connecting at its lower end with said horizontal slot-part; the threading finger  $d^2$ , arranged to be reciprocated in said fastener passage-way; and the plunger  $P^3$ , operated, substantially in the manner as and for the purposes set forth.

9. The combination with the horizontal slot-part  $g^3$ , having the button detaining spring  $I^2$ , of the passage-way  $n^7$ , provided with the threading finger  $d^2$ , and at its lower end connecting with said horizontal slot-part; the wheel  $W^2$ , arranged on the shaft  $S'$ , and provided with a perimetral cam  $K^2$ , having the contracted part  $k^4$ ; the lever  $l^2$ , pivoted at one

end to the machine frame and made with cam-  
pins <sup>7</sup> and <sup>4</sup>; and the plunger P<sup>3</sup>, pivotally  
connected to said lever on that end of the lat-  
ter which is opposite to that where pivoted to  
5 the frame substantially in the manner as and  
for the purposes set forth.  
Signed at the city of Troy, New York, this

15th day of December, 1891, and in the pres-  
ence of the two witnesses whose names are  
hereto written.

ALBERT W. HAM.

Witnesses:

W. E. HAGAN,  
CHARLES S. BRINTNALL.