

(No Model.)

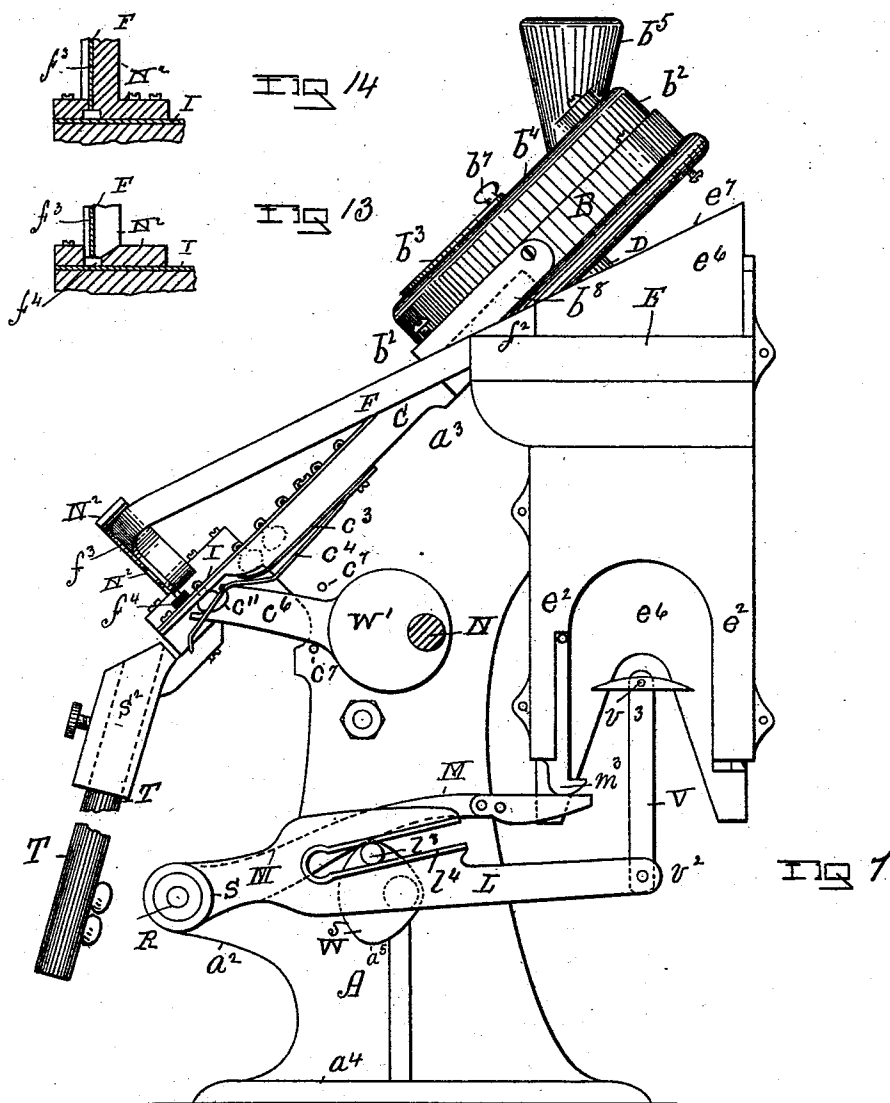
5 Sheets—Sheet 1.

A. W. HAM.

TUBE LOADER FOR BUTTON SETTING MACHINES.

No. 530,105.

Patented Dec. 4, 1894.



WITNESSES

William A. Sizer

Charles S. Brintnall

INVENTOR

Albert W. Ham

by W. C. Nagan atty

(No Model.)

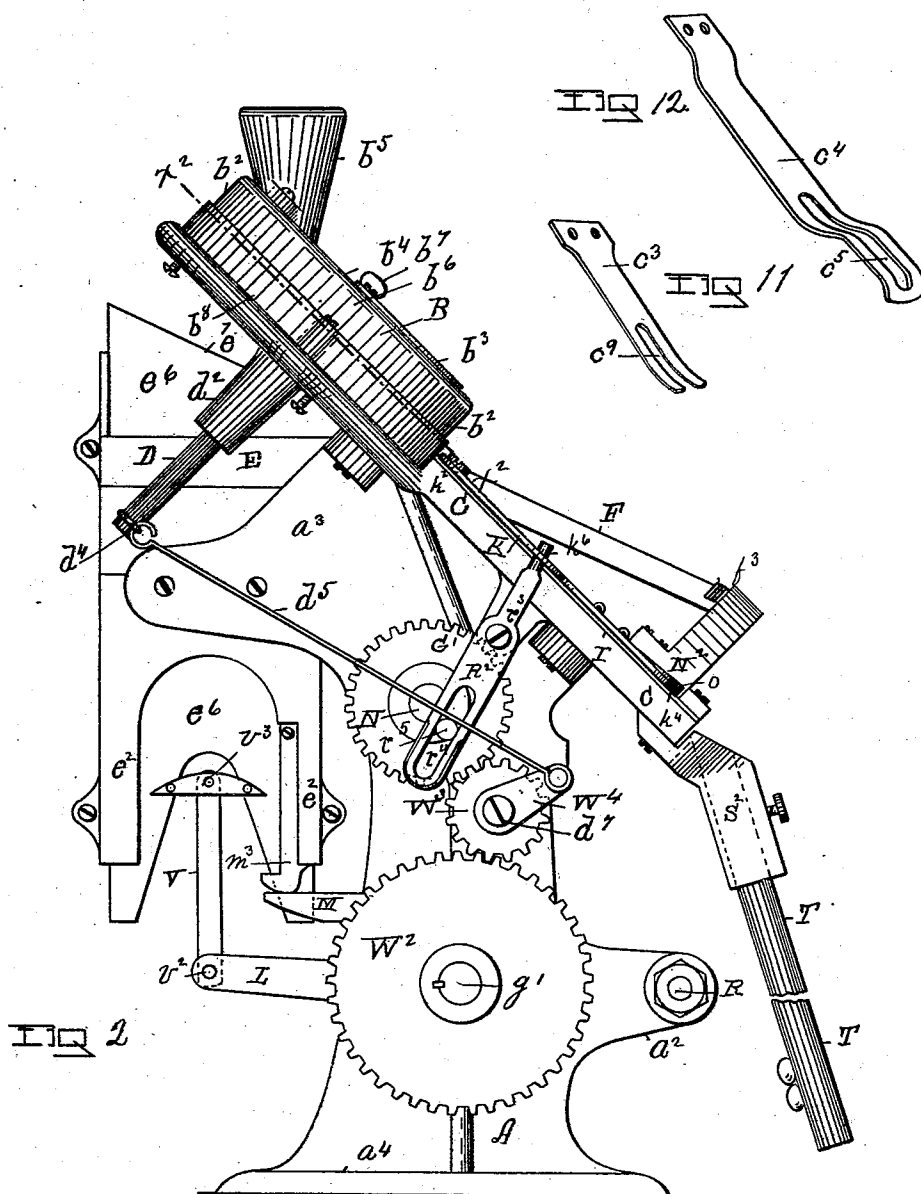
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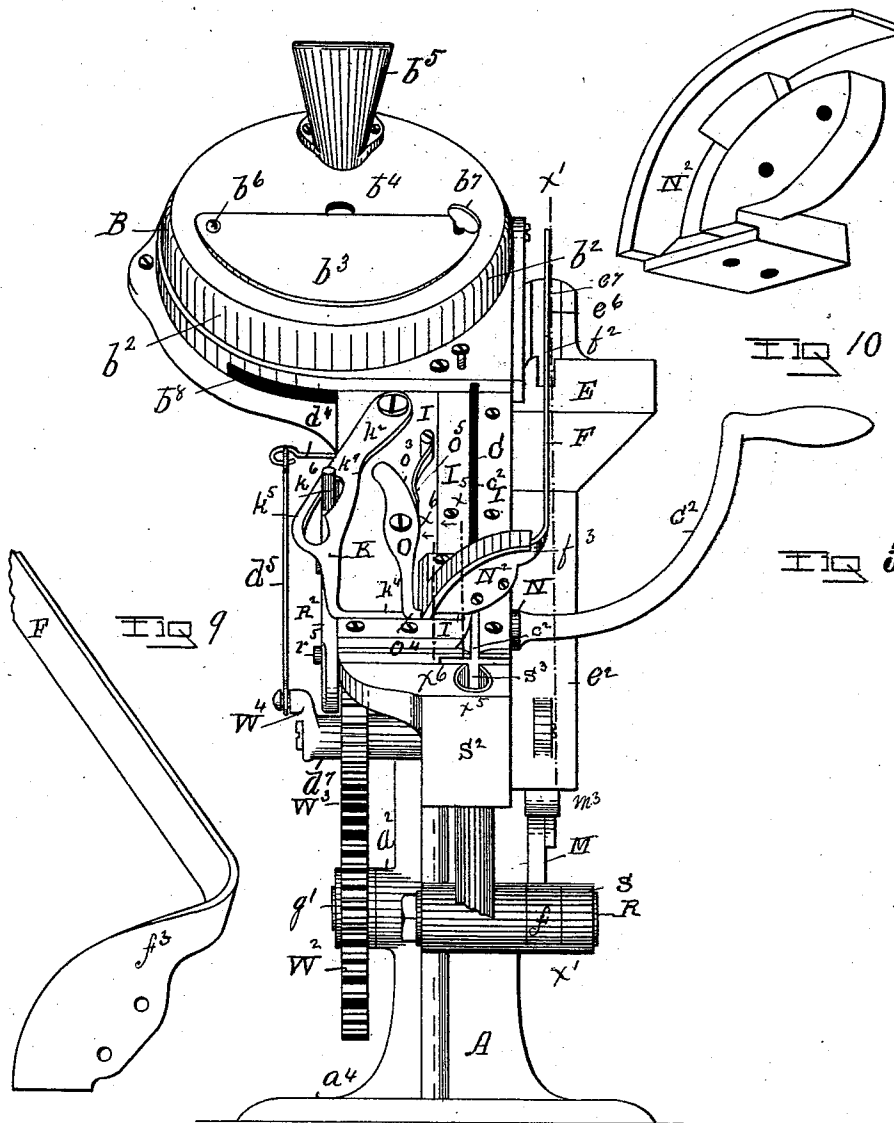
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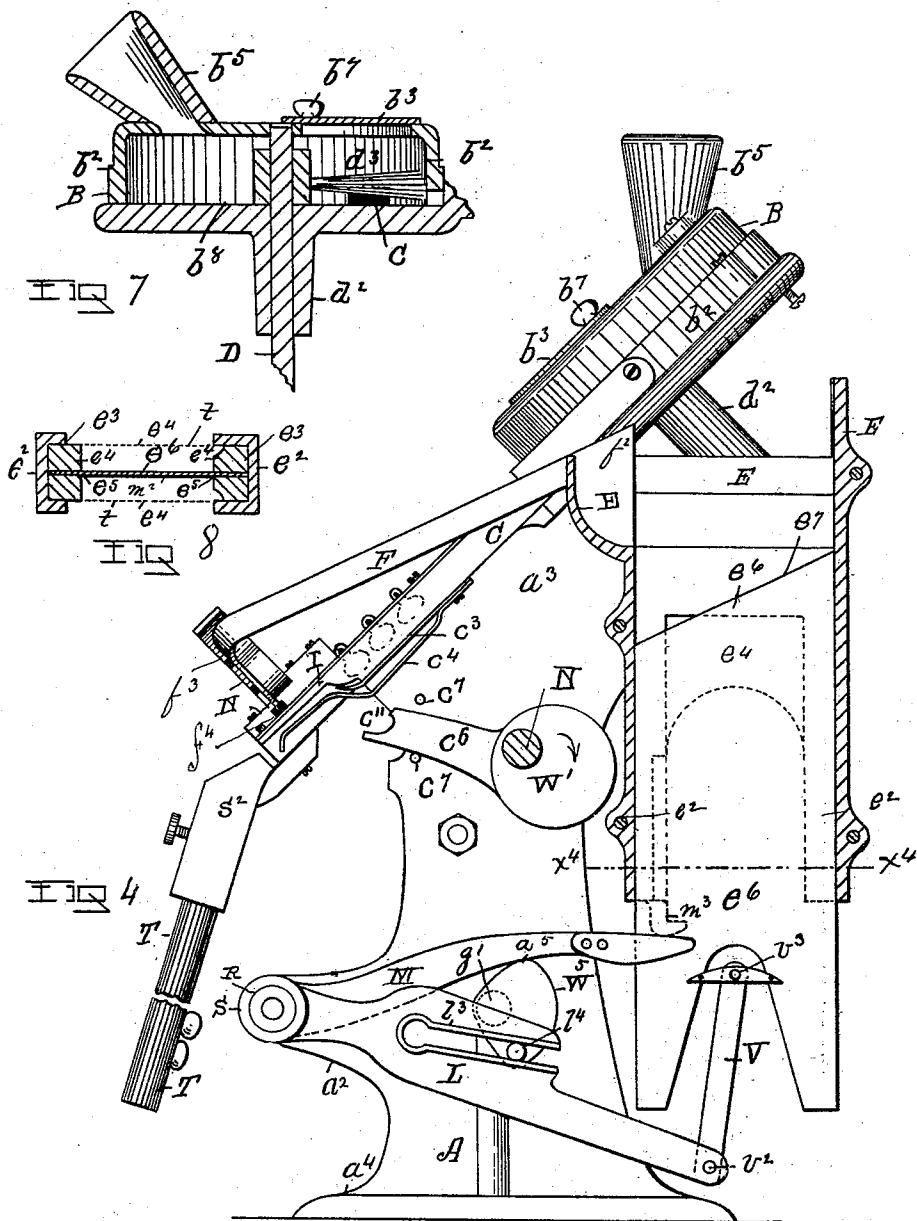
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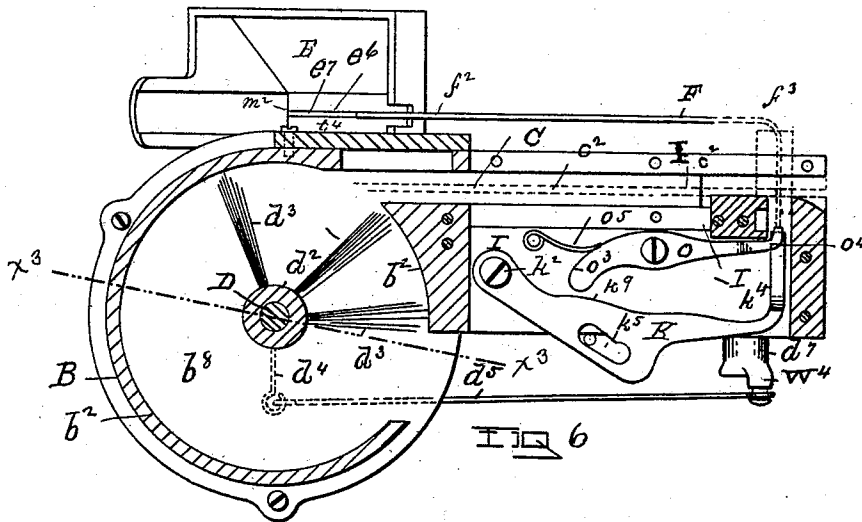
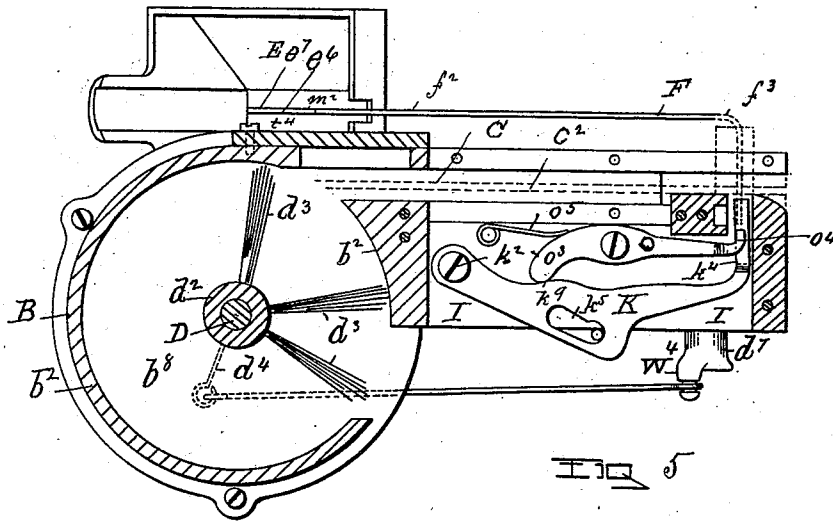
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WITNESSES

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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.

TUBE-LOADER FOR BUTTON-SETTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 530,105, dated December 4, 1894.

Application filed October 25, 1893. Serial No. 489,080. (No model.)

To all whom it may concern:

Be it known that I, ALBERT W. HAM, of Lansingburg, county of Rensselaer, State of New York, have invented new and useful Improvements in Tube-Loaders for Button-Setting Machines, of which the following is a specification.

My invention relates to improvements upon that class of machines which are used to thread fasteners or staples into the eyes of buttons, and to place the latter and connected fasteners into a detachable slotted chute-form tube adapted to connect with a button setting machine, for supplying the latter with buttons having fasteners threaded into the eyes thereof; and the object and purpose of my invention is to better adapt this class of mechanism to the uses for which it is designed.

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

Of the illustrations Figure 1, is a side elevation of the machine with that side of the latter on which an operating crank is placed shown as facing the view, and with the crank-shaft shown in cross-section. Fig. 2, shows in elevation that side of the machine which is opposite to that illustrated at Fig. 1. Fig. 3, is a front elevation of the machine. Fig. 4, is a section taken on the line x' , x' , of Fig. 3. Figs. 5, and 6, are transverse sections taken on the line x^2 , x^2 , of Fig. 2, with the connecting rod which operates the button hopper brushes shown in different positions. Fig. 7, is a section taken on the line x^3 , x^3 , of Fig. 6. Fig. 8, is a section taken on the line x^4 , x^4 , of Fig. 4. Fig. 9, is a perspective of the slide-blade which the fasteners straddle and descend upon from the staple or fastener hopper to where they are inserted in the button eyes; with this slide-blade shown as detached. Fig. 10, is a perspective of a cover guide-plate shown as detached from the machine, and which when in position on the latter is placed over the lower curved end of the fastener slide. Fig. 11, is a perspective of a button detaining spring shown as detached. Fig. 12, is a perspective of another button de-

taining spring which is also shown as detached. Fig. 13, is a section taken on the line x^5 , x^5 , of Fig. 3, and Fig. 14, is a section taken on the line x^6 , x^6 , of Fig. 3.

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

The letter A, designates the stand, on which the mechanism is operated and to which it is connected. This stand is made with the laterally extended arm a^2 , the upwardly inclined head a^3 , and the table-form base a^4 .

The letter B, designates a button hopper or receptacle which is attached to the head a^3 , and placed thereon so as to incline downwardly and frontwardly on an angle. This button hopper is circular in form having sides b^2 , a cap b^4 , a feed-chute b^5 , a door b^3 , which is pivoted to the cap at b^6 , and is secured thereto when closed by a set-screw b^7 . At one side of the hopper tangent to its side and opening out therefrom on a level with the hopper bottom b^8 , there is arranged a button chute C, made with a slot c^2 , in its upper surface, shown at Figs. 6, and 7, as connecting with the button hopper interior and at Figs. 1, 3, and 4, where extending downwardly on an incline from the button hopper. This button chute C, is adapted by its construction and connection with the button hopper to receive buttons from the latter with their eye-shanks projecting upwardly through the slot c^2 , formed in the upper face thereof, and in which position the buttons descend in the chute by gravity until their descent is arrested by the slotted leaf spring c^3 , arranged on the under side of said chute; one end of said spring being attached to the under side of the chute, with its slotted end free.

The letter c^4 , designates another leaf-spring which is also arranged on the under side of the button chute, and secured thereto at the same point as the spring c^3 , but outside of the latter and made to extend downwardly beyond it. This spring c^4 , is made with a slot c^5 , and the spring c^3 , is made with a slot c^6 , and both of these springs are shown as detached from the machine at Figs. 11, and 12.

The letter c^6 designates a button moving arm which at its inner end is strapped onto

an eccentric arranged upon the shaft N, back of the wheel W', the latter acting to keep the arm in place on the eccentric.

The letter C² designates an operating crank upon the shaft N. At each rotation of the wheel W', and shaft N the button moving arm c⁶, guided by the pins c⁷, c⁷, is moved upwardly and frontwardly to enter the slot of the detaining spring c³, and by means of the concave face c¹¹, on the outer end of said button moving arm, to engage with the lowermost button in the chute and move it downwardly in the latter until it is brought under the detaining influence of the spring c⁴, where the button is held by the latter until a fastener is threaded into its shank-eye, and by a succeeding movement of the arm c⁶, the button thus operated upon is forced from under the action of the holding spring to descend by gravity to connect with the tube-form chute T, and held in the slot of the latter by the fastener within the tube, and the button on the outside of the latter.

To force the buttons from the button hopper B, into the chute C, the following mechanism is used.

The letter D, designates a shaft adapted to journal in a sleeve d², that is downwardly projected from the bottom of the button hopper, as is shown at Figs. 2, and 7, and where extended upwardly to be within the hopper B, this shaft D, is provided with radially arranged brushes d³, that project laterally from the shaft.

The letter d⁴, designates a crank-arm that is arranged on the lower end of the shaft D, as shown by the dotted lines of Figs. 5, and 6; and this crank-arm links into at its outer end the upper end of the connecting rod d⁵, and the latter at its lower end pivotally connects with a crank-arm W⁴, on the shaft d⁷, of the gear-wheel W³, by which as the connecting rod is operated its connection with the crank of the shaft D, actuates the latter to rotate reciprocatingly within the hopper, and so operate the brushes to force the buttons into the chute C.

The letter E, designates the fastener hopper which has a V-form in cross-section, and is made with depending legs e², on the inner face of which latter there are arranged slides e³, as shown in cross-section at Fig. 8, in which slides a tumbler e⁴, moves reciprocatingly and vertically in the bottom of the fastener hopper. Within this tumbler at each side is arranged a slide e⁵, for the movement of the fishing-blade e⁶, which also moves with the tumbler within the said hopper when the tumbler is ascending; but which tumbler is not operated to descend until after the inclined upper edge e⁷, of the fishing blade in its descent has passed through the tumbler, so as to have the latter remove from off the upper edge of the fishing blade such fasteners as may have been irregularly caught by its edge, and to position the fasteners within the hopper to be caught by the succeeding ascent of

the fishing blade. This latter when at the limit of its upward movement will have its vertical side edge where adjacent to, and its slanting upper edge both in alignment with the top edge of the downwardly inclined stationary fastener slide blade, on to which the fasteners caught by the fishing blade when ascending will slide down as influenced by gravity to a point where they will be threaded into the button eyes, as will be subsequently described herein. This fishing blade or plate is operated to be vertically reciprocated through the hopper bottom by sliding within the tumbler as before described, and is so actuated by means of a pivoted lever L, which at its front end is hinged on to a rod R, which is projected laterally from the stand; said lever having an eye S, formed on its front end for such connection, and wherefrom this lever is extended rearwardly and is constructed with a cam-slot l³, arranged to receive a cam-pin l⁴, projected from the side of the cam-wheel W²; the latter being placed on and secured to the shaft g⁷, of the gear-wheel W², which latter meshes into the gear-wheel W³, on the shaft d⁷.

The letter V, designates a connecting rod which at v², is pivoted to the outer end of the lever L, and at its upper end pivotally connects with the fishing-blade e⁶, at v³.

The tumbler e⁴, has a flat top t, moving in the hopper bottom as shown at Figs. 5, and 6, which illustrations show also the slot m², made in the tumbler for the passage through it of the fishing-blade. The function of this tumbler is to turn over the fasteners in the bottom of the hopper to overcome their tendency to settle down with their prongs uppermost, and in such a position are not so well adapted to be caught by the fishing-blade. This tumbler e⁴, is shown as raised at Figs. 1, and 2, and shown as down at Fig. 4. The movement of this tumbler vertically is much less than that of the fishing-blade, and the top of the tumbler forms the bottom of the hopper when down. This tumbler is operated by the following mechanism.

The letter M, designates a lever which at its front end is hinged on to the rod R, inside of the lever L, by means of an eye f, formed on said lever M.

The letters m³, designate a leg depending from the tumbler, and this lever M, is operated to rise at its outer end to engage with said leg, and to upwardly move the tumbler by means of the cam a⁵, of the cam-wheel W⁵, which in its rotation engages with the lever M, after the cam-pin on this cam-wheel has actuated the lever L, to operate the fishing-blade. This tumbler descends under the action of gravity.

The letter F, designates the slide-blade, on which the fasteners in straddling descend by gravity, after having been so caught by the ascent of the fishing-blade before described. This fastener slide-blade at its upper end f², is made with vertical sides, and at its lower end with a down-curve f³, whereat its sides

are at right angles to the plate I, as shown at Figs. 1, and 4. The lower end edge of this slide-blade is transversely parallel to the top of the plate I, but far enough from contact with the latter to admit the passage of a fastener between the lower end of the slide-blade and the plate I. Thus made the fasteners descending on the slide-blade as they straddle it will follow around in radial position of arrangement upon the curved end f^3 , until the bottom fastener is in a horizontal position with its prongs pointing toward the button chute, and thus adapted when released from the slide-blade to fall into the guide-way f^4 , made in the plate I, by means of an upcast recess made in the bottom of the cover-plate N^2 , and thus positioning the fastener to be moved through said guide-way, and threaded into the upcast eye of a button in the chute C. The cover-plate N^2 , extends upwardly in curved projection from the plate I, to be over the bend f^3 , in the slide-blade, and far enough away from the rounded ends of the descending fasteners to allow of their free passage downwardly, but at such a distance from them, as will prevent the fasteners from over-riding each other as they radially arrange to pass around the curve.

The letter K, designates a threading finger which at its upper end k^2 , is pivoted to the plate I, to rest thereon, and at its lower end where formed with an angle as it turns inwardly toward the bottom of the slide-blade its digital end k^4 , it is adapted to move a fastener through the eye of a button by passing it through the guide-passage f^4 , as said button is being operated upon by the arm c^6 , in the button chute C. To actuate this threading finger, and to have it move synchronously with the arm c^6 , a cam-slot k^5 , is made in the threading finger and a cam-pin k^6 is arranged on the rock-bar R^2 , which pin is within the slot k^5 . The rock-bar is pivoted at r^3 , and at its lower end has a cam-slot r^4 , which operates in connection with a crank pin r^5 , that is projected from the side of the gear-wheel G' , on the driving shaft N, on which is also arranged the wheel w' , which operates the arm c^6 . To detain the lowermost fastener on the slide-blade and to keep it in position until the one being operated by the threading finger has entered a button eye, the finger form spring O, is employed. This spring finger is arranged to be over the threading finger, and it is pivoted to the plate I between its ends with the upper one of the latter having the cam o^3 , formed thereon, and at its lower end the inturnd finger form end o^4 .

The letter o^5 , designates a leaf-spring connected to the plate I, and arranged to bear against the spring-finger O, and cause its lower turned in end to engage with the lowermost fastener upon the blade slide and to detain it until released from such engagement by the contact which the surface k^9 , of the threading finger makes with its cam o^3 , when it draws away from contact with the fastener;

with this release of the lowermost fastener occurring while the threading finger is moving inwardly to thread a previously released fastener, which has descended on to the plate I, after which engagement of the cam o^3 , ceases, and the spring o^5 , forces in the lower end of the finger O, to engage with the last fastener on the slide-blade as before.

The letter G' , designates a gear-wheel on that end of the shaft N, which is opposite to that whereon is placed the eccentric wheel W' , and this gear-wheel G' , operates the threading finger as before described; and in connection meshes into the gear-wheel W^3 , on the shaft of which d^7 , is arranged the crank-arm W^4 , that by means of the connecting rod d^5 , actuates the hopper brushes. This gear-wheel W^3 , meshes into the gear-wheel W^2 , and the latter operates the cam-wheel W^5 , arranged on the shaft g' , this last named cam-wheel actuating the lever L, which moves the fishing blade, and also the lever M, which operates the tumbler, as before described.

The letter S^2 , designates a socket attached to the lower end of the plate I, and this socket is adapted to have passed upwardly therein the slotted tube-form button chute T, with the slot S^3 , of the latter connecting with the slot c^2 , of the button chute C, as shown at Fig. 3, in front elevation, and at side elevation as entered in the socket at Figs. 1, 2, and 4. As thus placed the tube T, has its slot upon its under side where connecting with the chute C, so that the eyes of the buttons enter the slot of the tube with their fasteners pendent therefrom within the tube, and with their buttons exteriorly placed. This tube T, is provided with a stop at its lower end which is not shown, and when loaded with buttons having fasteners threaded into the eyes thereof it is removed from the socket and attached to a button setting machine.

As thus constructed the mechanism delivering the fasteners places them in close proximity to the button chute C, and by which the use of a closed fastener chute is dispensed with, and the wedging therein of the fasteners by the feeding finger avoided. The slide-blade being open and accessible facilitates the removal of any irregularly formed fasteners that may accidentally happen to become mixed with the others, and which interfere with the working of the machine. Not only these advantages are had by my improvements, but the position of the buttons with eyes upcast instead of pendent avoids the exact positioning of the button eyes relatively to the feeding finger, where the shanks of the buttons vary in length as there is always enough of the eye opening above the edge of the button slot to receive the fastener prong when my improved arrangement of button-chute is used; and which, when the old forms of chute were employed, in which the shank-eyes of buttons are pendent, as the fastener prong is moved to enter the eye it is apt to engage with the shank above its eye and be deflected

therefrom. This often occurs from the varying length of shanks which buttons have and when occurring interferes with the proper working of the machine.

5 I am aware that two oppositely reciprocating slides have been combined with a hopper and feed trough for delivering screw blanks to the latter, but in my device the plunger and the fishing plate move in the same reciprocating direction, the fishing plate passing through the plunger and in advance of the latter in its upward and downward movement.

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

15 1. In a machine for threading fasteners into the eyes of buttons the combination with a hopper constructed with brushes adapted to be oscillated therein, substantially as described, of a downwardly inclined button-chute having a slot in its upper face, and adapted to receive buttons from said hopper with their eyes projected upwardly in said slot; a slotted spring arranged on the under side of said chute adapted to arrest the descent of buttons therein; an arm operated by an eccentric and constructed to enter the slot of said detaining spring and to engage with buttons to move them downwardly one at a time; and another spring made with a slot and also attached to the under side of said button chute, adapted to engage with and hold each button while being operated upon by said arm after having passed said detaining spring and while a fastener is being threaded into the eye thereof, substantially in the manner as and for the purposes set forth.

2. In a machine for threading fasteners into the eyes of buttons the combination with a button-chute made with a slot in its upper face and constructed to have buttons supplied thereto with their eyes projected upwardly through said chute-slot, of a detaining slotted spring arranged on the under side of said button-chute; an arm projected from an eccentric wheel, and operated to enter the slot of said detaining spring to move one of the buttons downwardly in said chute at each revolution of said wheel, and a holding spring made with a slot for the passage of said arm, and arranged to engage with said button while being moved by said arm substantially in the manner, as and for the purposes set forth.

3. The combination with the eccentric wheel W', made with the arm c⁶, adapted to move between the guide-pins c⁷, c⁷, of the button-chute C, having the slot c², and the slotted springs c², c³, arranged on the bottom of said button-chute, constructed and arranged to

operate substantially in the manner as and for the purposes set forth.

4. The combination with the arm c⁶, arranged to turn eccentrically at its inner end on the shaft N, and made with the concavely recessed face c¹¹, on its outer end, and adapted to move between the guide-pins c⁷, c⁷, of the wheel W', arranged to turn with the shaft N, and the button chute C, made with the slot c² in its upper face, and the slotted springs c³, c⁴, upon its under surface and having the socket S² on the lower end; and the tube-form chute T, made with a closed lower end, and a slot on its under side connecting with the slot c², constructed and arranged to operate substantially in the manner as and for the purposes set forth.

5. The combination with the downwardly inclined button-chute made with a slot in its upper face, and arranged to receive buttons with the eyes thereof projected upwardly through said slot, of a downwardly inclined fastener slide-blade, constructed to receive fasteners straddling the latter, and made with a bend in its lower end by which the end edge of the slide-blade becomes parallel to said button chute; a guide-passage beneath the lower end of the slide-blade; a pivoted spring finger provided with a cam at its upper end; a threading finger constructed to engage with the spring finger and move the latter outwardly at its lower end when the digital end of the threading finger is being moved to enter said guide passage; and a tube having a closed lower end and made with a slot in its under side connecting with the slot in the button chute, substantially in the manner as and for the purposes set forth.

6. The combination with the inclined fastener slide-blade F, having the bottom curve f³, of the button-chute C, arranged in the plate I, and provided with the slot c²; the cover-plate N², made with the recessed passage f⁴, on its under side where over the plate I; the threading finger K, having the cam surface k², the digital intumed lower end k⁴, and arranged on the plate I; and the spring-finger O, pivoted to the plate I, and provided with the leaf-spring o⁵, cam o³, and an intumed digital lower end, constructed and arranged to be operated substantially in the manner as and for the purposes set forth.

Signed at the city of Troy, New York, this 20th day of February, 1893, in the presence of the two witnesses whose names are hereto written.

ALBERT W. HAM.

Witnesses:

W. E. HAGAN,
CHARLES S. BRINTNALL.