(No Model.) 2 Sheets—Sheet 1.

# S. SCHWAB.

## MACHINE FOR FASTENING BUTTONS.

No. 344,600. Patented June 29, 1886.

Fig. 1.

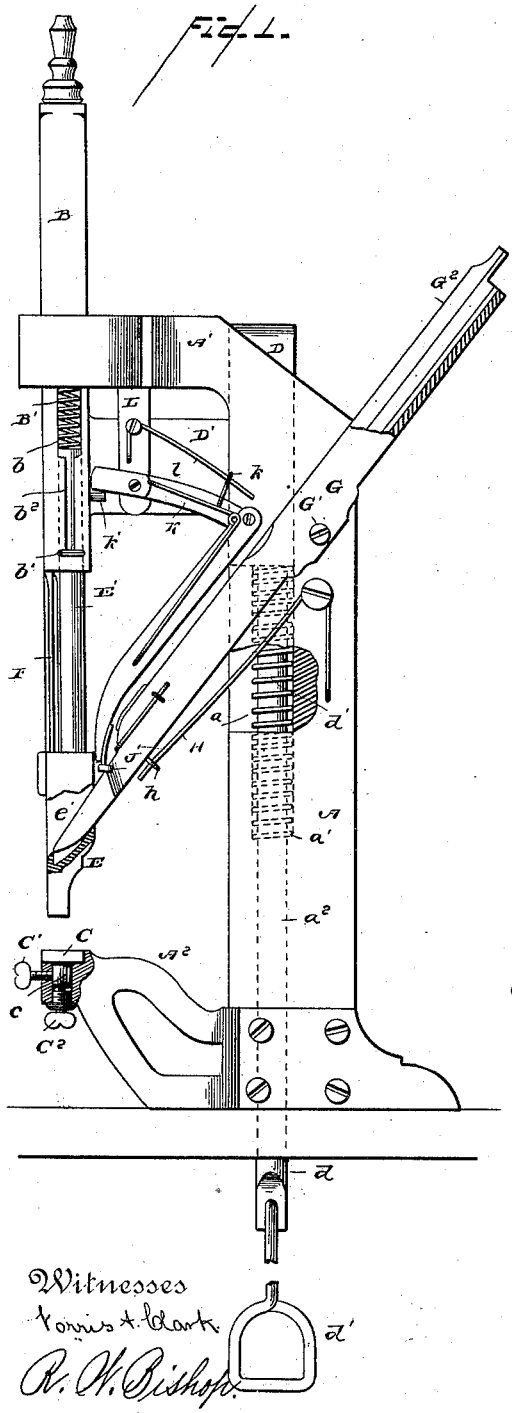
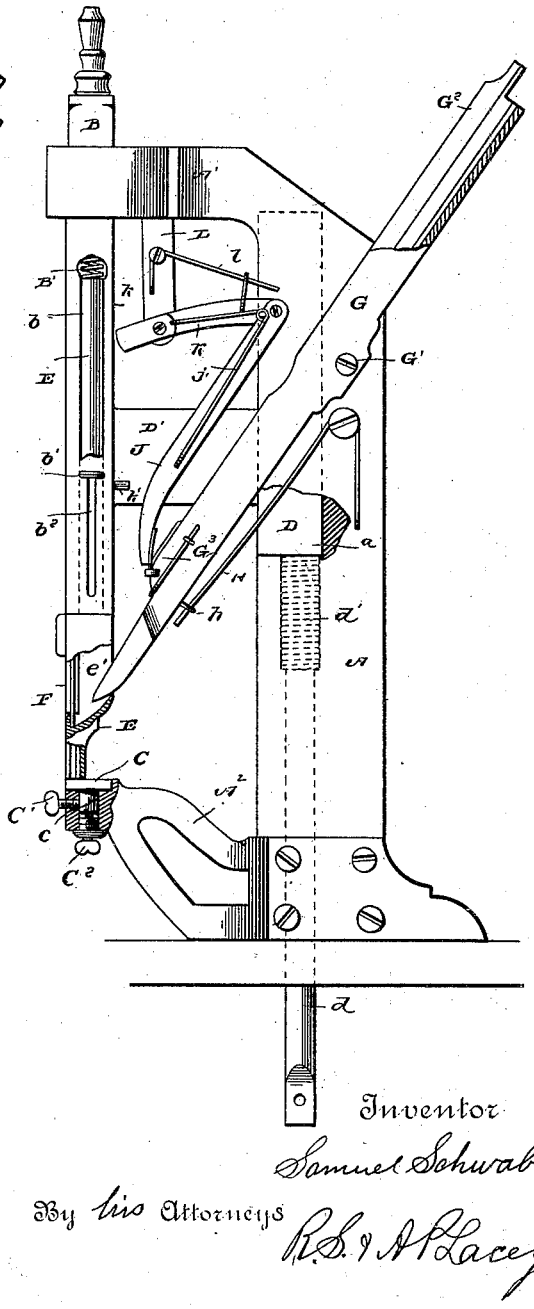


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

# S. SCHWAB.

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Fig. 4.

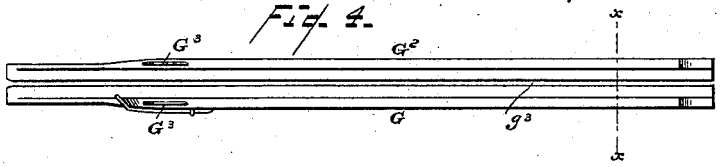


Fig. 3.

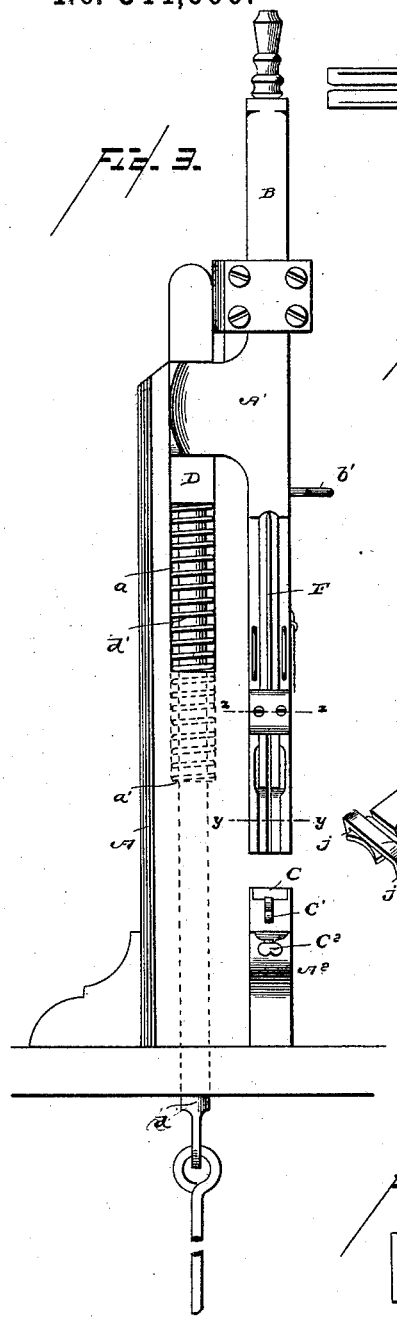


Fig. 5.

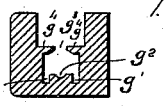


Fig. 6.

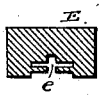


Fig. 7.

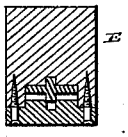


Fig. 8.

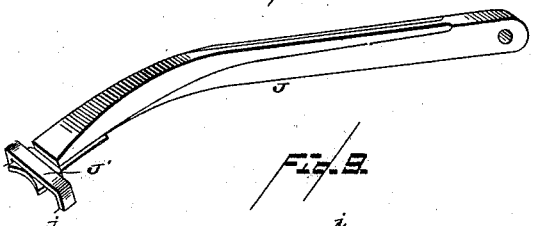


Fig. 9.

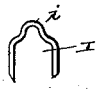


Fig. 10.


Fig. 11.


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# UNITED STATES PATENT OFFICE.

SAMUEL SCHWAB, OF WINDSOR, MISSOURI.

## MACHINE FOR FASTENING BUTTONS.

SPECIFICATION forming part of Letters Patent No. 344,600, dated June 29, 1886.

Application filed April 13, 1886. Serial No. 198,727. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL SCHWAB, a citizen of the United States, residing at Windsor, in the county of Henry and State of Missouri, have invented certain new and useful Improvements in Machines for Fastening Buttons; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to button-fastening machines of that class in which the buttons and their loosely-connected staples are fed from a chute or raceway one by one and delivered into a guide, through which a plunger or driver works to force the staples through the material to which the buttons are to be attached, the prongs of the staples being clinched at or turned into the under side of the material, the object being to improve the mechanism by which such operation is performed, whereby the machine is simplified, its efficiency increased, and free access to the parts may be had for repairing, lubricating, and cleaning.

It consists in the novel features of construction and combination of the several parts, more fully hereinafter set forth, claimed, and shown in the annexed drawings, in which—

Figure 1 is a side view, partly in section, showing the relative position of the parts previous to the operation of the machine. Fig. 2 is a similar view showing the relative position of the parts after the operation, just before the parts have returned to a normal position. Fig. 3 is a front view. Fig. 4 is a plan view of the guide-race. Fig. 5 is a section of the latter on the line X X. Fig. 6 is a section of the guide on the line Y Y, Fig. 3. Fig. 7 is a section of the guide on the line Z Z. Fig. 8 is an enlarged perspective view of the feeding-arm. Fig. 9 is a view of the staple. Fig. 10 is a perspective view of the lower end of the plunger. Fig. 11 is a plan view of the bed-die.

The standard or upright A is tubular, and is provided at its upper end with an overhanging arm, A′, through the outer end of which works a plunger, B. The lower end of the standard is expanded, and is designed to be attached to any suitable support. Arm $A^2$, branching therefrom, forms a support for the material to which the buttons are to be attached. It is vertically apertured to receive the shank *c* of a bed or die, C, seated in a recess formed in its upper side. The die is vertically adjustable relative to the arm, and is held in its adjusted position by a set-screw, C′, passing through the side of the arm and bearing on the shank of the die. To facilitate the adjustment of the die, its shank rests upon or contacts with a set-screw, $C^2$, projecting through the lower side of the arm in such manner that by turning the screw to the right or left the die will follow its movements and be adjusted higher or lower, as desired.

The upper end of the tubular standard is slotted on one side for a short distance in the direction of its length, forming a guideway, *a*, in which works a head, D, from which extends an operating-rod, *d*, projecting into and working through the bore of the standard. Arm D′, springing from the head, unites the same with the plunger B, thereby causing both to move synchronously. Coil-spring *d*′, surrounding the operating-rod and bearing on the under side of the head and on a stop or shoulder, *a*′, within the bore $a^2$ of the tubular standard, holds the head and plunger at its highest movement, and returns the same to such normal position at the end of each operation. To facilitate the manipulation of the machine by foot, thereby leaving the hands of the operator free to give direction to the material, and for other purposes, a stirrup, *d*′, is connected with the end of the operating-rod; or, in lieu of such stirrup, any well-known means may be applied.

A presser-guide, E, is yieldingly connected with the end of the plunger by means of a shank, E′, projecting therefrom, entering a bore, *b*, in the lower portion of the plunger, and held at its lowest position by a coil-spring, B′, interposed between the end of the shank and the bottom of the bore. The shank projects some distance within the plunger to give it a firm connection therewith and prevent any wabbling. It is prevented from

dropping out or being forced from the plunger by a pin, $b'$, passing through a slot, $b^2$, in the side of the plunger and into the shank. The end of the presser is located directly over the bed-die.

Driver F, projecting from the end of the plunger, is uniform in cross-section near its lower portion, which is adapted to work through a bore or guideway, $e$, of corresponding shape, formed in the presser-guide, which is transversely slotted or mortised at a point, $e'$, between its upper and lower ends. The front side of the presser-guide is cut away below the mortise sufficiently far to permit a lateral communication with the bore. The upper and lower walls of the mortise are inclined from front to rear in an upward direction. Within the mortise terminates the lower end of the raceway G, pivoted at G' to the standard. Said end is beveled and closely fits the front side of the presser-guide. It rests upon the lower wall of the slot, and is held in place thereon by a spring, H, fastened at one end to the standard, and having its free end passing loosely through a keeper, $h$, on the raceway, which is set at a steep incline to insure the feeding of the buttons and their loosely-connected staples. A rectangular opening formed longitudinally through the raceway, having a raised portion, $g$, projecting from its bottom midway from its sides, leaving grooves $g'$, one on each side thereof, has a groove, $g^2$, in its crown, extending the full length. The top of the raceway is provided with a slot, $g^3$, communicating with the opening therein. The slot is in direct line with the groove $g^2$, and the lower corners, $g^4$, of that portion of the top on each side of the slot is beveled to allow the curved portion of the staple to fit therein and prevent binding between the staple and the button. The buttons rest on the top in the usual manner, and their shanks, having loosely connected therewith staples I, pass through the slot $g^3$, and the prongs of the staples, running in the grooves $g'$, guide and hold the staple in a true position relative to the button and prevent the staple binding or becoming accidentally knocked to one side out of line. The ends of the shanks are adapted to run in the groove $g^2$, to prevent any sidewise movement of the buttons. The opening in the raceway communicates with the opening in the presser below the mortise, and the slot $g^3$ is in register with the lateral opening through the front side of the presser.

The lateral flanges $G^2$ on each side of the raceway terminate in inclined planes $G^3$ near its lower end. These inclined planes may or may not form an integral part of the flanges, as desired.

A feeding-arm or ejector, J, located above the raceway, is pivoted at one end to a lever, K, fulcrumed between its ends on a bracket, L, depending from the overhanging arm A'. The other or opposite end of the ejector or feeding-arm is provided with a cross-head, J', having depending flanges $j$, to embrace the sides of the raceway and prevent lateral displacement. A bell-crank spring, $j'$, interposed between the lever and ejector, holds the end of the latter close upon the raceway. Spring-arm $l$, secured to the bracket L and passing through a loop, $k$, constantly exerts an upward force on the outer end of the lever K to lift it when its inner end is released from a stop, $k'$, on the plunger.

The parts are so proportioned that when the plunger is at its highest stroke the cross-head on the end of the ejector is at the foot of the inclined planes, and when the plunger is at the end of its downward stroke the cross-head will be at the top of the inclined planes.

In practice the buttons, with the staples I loosely connected therewith, are placed in the raceway with the prongs of the staples foremost. The buttons are prevented from running through the raceway and held in check by a delaying spring-arm, M, fastened to the side of the raceway and having its end projecting within the path of the buttons. The material to which the buttons are designed to be attached is placed on the bed die. The plunger being depressed by means of power applied to the opening-rod, the pressure-guide descends and rests upon the material. Owing to the yielding connection between it and the plunger, it accommodates itself to varying thicknesses of material. During the descent of the plunger the stop $k'$ is released from the inner end of the lever K, when, by reason of the spring-arm $l$, the ejector is elevated and its cross-head, riding the cams or inclined planes $G^3$, is gently lifted over a button. The plunger being permitted to rise, the stop will contact with the lever and force its inner end up and its outer end down, carrying with it the ejector, which will disengage a button from the delaying-arm. The button, being free, will gravitate and enter the guide-opening in the presser. The staple will be retained within the presser-guide, while the button will be located without and held to the staple by its shank, which works through the lateral opening in the front of the presser-guide. The plunger being a second time depressed, the driver, bearing on the staple and shank of the button, forces the prongs of the staple through the material, which, entering grooves in the bed-die, are bent and caused to overlap one another and clinched at or turned into the under side of the material. The operation of the device is now continuous, a button being fed at each upstroke of the plunger and fastened at each depression thereof, as will be readily comprehended.

The staple has a raised portion, $i$, in its base, which engages the shank of the button. The end of the driver is centrally depressed to receive the raised portion of the staple and the shank of the button. By this construction the eye of the button-shank is preserved in its natural shape and the driver bears equally on the shank and on the staple.

The grooves $c'$ in the bed-die extend par-

allel with each other in a diagonal direction relative to the guide-opening in the presser in such manner that the outer ends of each are directly under and receive the ends of the prongs of the staple and guide them past one another when clinching.

The lower end of the raceway is projected across the path of the driver normally; but upon descent of the presser-guide it is withdrawn from its path by the spring H, as clearly indicated in Fig. 2.

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

1. In a button-fastening machine, the combination of a movable head, a plunger carried thereby, a presser having a shank telescoping with the plunger and provided with a guide-opening located to one side of the shank, a spring interposed between the plunger and presser to normally keep them separated, and a driver projecting from the lower end of the plunger, located to one side of the shank of the presser, and adapted to work through the guide-opening therein, substantially as and for the purpose described.

2. The combination of the plunger, the guide-presser having an oblong passage-way formed vertically therethrough, a driver, and a bed-die having parallel grooves diagonally arranged relative to the passage-way through the presser, whereby the prongs of the staple will be compelled to pass and lie alongside of each other when clinching, substantially as set forth.

3. The combination, with the plunger, a guide-presser carried thereby, a driver working through the presser, and a support beneath the presser, of a die secured to said support, and a set-screw bearing upon the under side of the die for positively adjusting it relative to the support, substantially as described.

4. The combination, with the guide-presser and the raceway having a delaying-arm, of an ejector or feeding-arm intermittently actuated for positively disengaging the buttons from the delaying-arm, substantially as shown and described.

5. The combination, with the plunger, the raceway, and a feeding-arm, of a stop on the plunger for actuating said arm, substantially as and for the purpose specified.

6. The combination of the plunger, raceway, feeding-arm, a lever fulcrumed between its ends and pivotally connected at one end with the feeding-arm, and a stop projecting from the plunger for actuating said lever at or near the end of its movement, substantially as set forth.

7. The combination of the plunger, the raceway, a feeding-arm, a lever fulcrumed between its ends and pivotally connected at one end with the feeding-arm, a spring interposed between the lever and feeding-arm to hold the latter in contact with the raceway, a spring-arm connected with the other end of the lever to exert an upward force thereon, and a stop projecting from the plunger within the path of the free end of the lever to act in opposition to the force of the spring-arm, substantially as and for the purpose set forth.

8. In a button-fastening machine, the combination, with the guide-presser, of a raceway having a longitudinal opening therethrough, and a raised portion extending from its bottom side, forming grooves, one on each side of the raised portion, between it and the sides of the openings, substantially as described, and for the purposes specified.

9. In a button-fastening machine, the raceway having a guide-opening therethrough, and a raised portion extending from the bottom of the opening and forming grooves on each side thereof, between it and the sides of the opening, and having a groove in its top, substantially as and for the purpose set forth.

10. In a button-fastening machine, the herein-described raceway having an opening therethrough and a guide-slot leading therefrom through the top, and having the under lower corners of the top adjacent the slot beveled, substantially as described, and for the purpose specified.

11. The combination of the raceway, inclined planes near its lower end, and an ejector or feeding-arm riding upon said planes in its operation, substantially as and for the purposes set forth.

12. The combination of the raceway, a delaying-arm projected across its path, and an intermittently-operated feeding-arm to act in opposition to said delaying-arm, as and for the purposes described.

13. In a button-fastening machine, the combination of the guide-presser having a cruciform opening therethrough, and a driver of corresponding shape to work in said opening, substantially as described.

14. The herein-described driver for button-fastening machines, cruciform in cross-section and centrally depressed at its end, forming extensions to bear upon the shank of the button and the shoulders of the staple.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL SCHWAB.

Witnesses:
MARTIN F. BOOTH,
R. W. MAJOR.