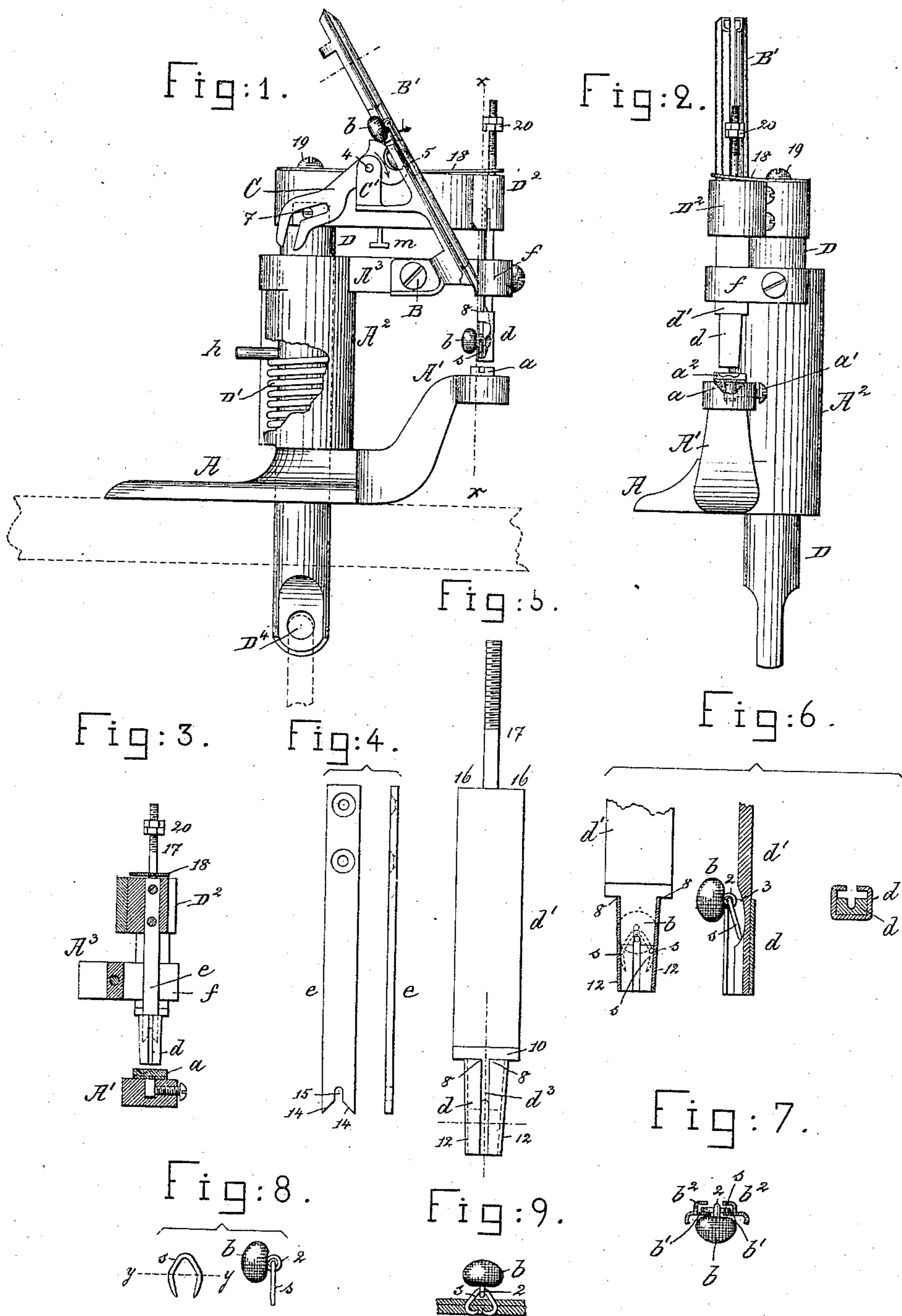


(No Model.)

E. O. ELY.  
BUTTON SETTING MACHINE.

No. 312,987.

Patented Feb. 24, 1885.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 312,987, dated February 24, 1885.

Application filed September 10, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD O. ELY, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Button-Setting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to and is an improvement upon that class of button-setting apparatus represented in United States Patent No. 293,234, and has for its object to produce a machine wherein the buttons and staples shall be automatically presented to a guide or carrier having a combined driver and former cooperating therewith, the driver causing the insertion of the staple through the leather or other material of a boot or shoe or other article, shaping and forming the head of the staple. The points of the staple are clinched or inturned by a suitable anvil.

The particular features in which my invention consists will be pointed out in the claims at the end of this specification.

Figure 1, in side elevation, partially broken out, represents a machine embodying my improvements, with the guide or carrier in an intermediate position, it being partially moved downward toward the horn or support; Fig. 2, a front elevation thereof, the anvil-block being broken out to show the anvil-die. Fig. 3 is a section at the right of the dotted line  $x x$ , Fig. 1. Fig. 4 represents the driver removed; Fig. 5, the button guide or carrier and its shank; Fig. 6, a section of Fig. 5 in different lines; Fig. 7, a section of the staple-raceway with staple therein and a button suspended. Fig. 8 represents a staple and a button with staple attached, and Fig. 9 represents one of my improved staples clinched and holding a button in place on a piece of leather.

The frame-work of the machine consists, essentially, of a base, A, to be attached to a table, a horn or support, A', to enter a shoe, and the post A<sup>2</sup> and bracket A<sup>3</sup>. The horn or support at its outer end is provided with an anvil-block,  $a$ , connected therewith by a screw,  $a'$ , and slotted for the reception of a die,  $a^2$ , having suitable concavities (see Fig. 2) of such shape as to direct the point of the legs

of the staple  $b$  toward each other, causing them to be inturned and clinched, as represented in Fig. 9. The bracket A<sup>3</sup> has attached to it by screw B the staple-raceway B', which is composed, as herein shown, of metal shaped to present edges  $b'$ , with a slot between wide enough for the passage of the shank or eye 2 of the button  $b$ , the metal near the said edges thus placed side by side, so as to occupy the same place, serving to support the opposite legs of the staples  $s$ , which latter at their crowns receive and sustain the buttons, the latter being in a state of suspension and being supported only by the staples as the buttons move toward the guide or carrier  $d$ , to be described.

Above the parts  $b'$  are the flanges or lips  $b^2$ , which act to guide the legs of the staples as the latter descend in the raceway toward the guide and carrier  $d$ , the said lips directing the points of the said staples into the flaring mouth 3 of the said guide or carrier.

The button-separator herein shown consists of a lever, C, pivoted at 4 on a bracket, C', the said lever having its inner end concaved or cut away to form between its toe 5 and heel 6 a recess for the reception of the head of the button, as in Fig. 1, the heel 6 of the separator acting to sustain the next button of the column of buttons at the rear of that button which is grasped by the separator. The rear end of the separator is slotted to receive a pin, 7, connected with the spindle D, which is extended down through the spiral spring D' and post A<sup>2</sup>. Movement of the separator in the direction of the arrow thereon far enough to remove the toe 5 from in front of the button permits the latter to pass the separator, and the staple connected with it, to descend in the raceway, and from the said raceway into the guide or carrier  $d'$ . The lower end of the raceway is inclined or beveled, to come close to or meet the upper corners, 8, of the guide or carrier  $d$  when the latter is in its most elevated position, the slot at the lower end of the raceway at such time being made to intersect or coincide with the slot  $d^3$ , left at the rear side of the said guide or carrier, so that the shank 2 of the button passes readily and unerringly into the said guide or carrier. As the shank 2 of the button leaves the slot in the raceway

and enters the slot in the guide or carrier, the legs of the staple are carried past or across the upper corners, 8, of the guide or carrier, and are projected into the inclined space 3 at the top of the said guide or carrier, as in Fig. 6, dotted lines, and, striking against the inclined surface made in the shank  $d'$  of the guide or carrier, the points of the staple are directed downward into the said guide or carrier. The side walls, 12, of the guide or carrier (see Fig. 6) are beveled or inclined, approaching each other from top to bottom, in order that the legs of the staple resting against the said inclined walls shall be prevented from descending therein by gravity alone, and also so that when acted upon by the driver  $e$  the said staples will be slightly closed, such closing taking place both while the staple is being moved through the guide and carrier and while it is being forced through the material, said inclined walls absolutely preventing the spreading of the staple. The spindle  $D$  is provided with a pin,  $h$ , which rests upon the upper end of the spiral spring  $D'$ , supported at its lower end by the base  $A$ , and consequently the spindle, with its arm  $D^2$ , is normally held elevated; but the said spindle and arm and its attached driver  $e$  may be depressed when it is desired to drive a staple and attach a button to a boot, shoe, or other article. Preferably, the spindle will be operated by a treadle and strap or link (not shown) connected with the eye  $D^4$  at the lower end of the spindle. The driver at its lower end is forked, as shown best in Fig. 4, the inner edges of the fork being beveled, as at 14, to act upon the head of the staple and insure the preservation of its V-shaped head, and above the said inclines the said driver is notched, as at 15, for the reception of the shank 2 of the button. The shank  $d'$  of the guide or carrier has two shoulders, 16, and a screw-threaded extension, 17. This extension is passed up through a spring, 18, attached to the arm  $D^2$  by a screw, 19, and above the said spring the extension 17 is provided with a suitable nut, 20, and check-nut. The shank  $d$  is placed and held loosely in the guide  $f$  and in a guide at the end of the arm  $D^2$ . The nut 20 is so adjusted that as the arm  $D^2$  rises, under the action of the spring  $D'$ , the said arm will lift the shank  $d'$  just high enough to place the upper corners, 8, of the guide or carrier  $d$  next the delivery end of the staple-raceway, in which position the guide or carrier is left, while it receives from the said raceway a staple and connected button, and in such position the lower end of the driver is maintained above the inclined part 10 of the shank  $d'$ .

After the shoe or other article which is to have a button attached to it is placed on the horn or support, the operator will depress the spindle, and as the latter descends the shank  $d'$ , placed in the guide at the end of the arm  $D^2$ , will also descend with it, chiefly by reason of its gravity, until the lower end of the guide or carrier  $d$  meets the material of the boot or

shoe or other article, when the spring, bearing upon the shoulder 16 of the shank  $d'$ , will, during the farther descent of the arm  $D^2$ , force the lower end of the guide or carrier  $d$  closer and closer against the material. Just after the spring commences to act and force the lower end of the guide or carrier against the material, the driver in its descent meets the upper end of the staple, and during its farther descent the said driver acts to drive the staple into and through the material, and the points of the staple into the cavities of and against the anvil-die, the latter causing the legs of the staple to be clinched, as before described. The extent of the descent of the spindle and arm  $D^2$  may be regulated in any suitable manner—as, for instance, by a screw-bolt,  $m$ —and so by adjusting the said screw, the distance at which the crown of the staple is left above the material may be regulated.

I have herein shown a staple of peculiar shape and adaptability for the purpose of a button-fastener; but such staple is not herein claimed, as it forms the subject-matter of another application, Serial No. 142,600.

In accordance with my invention the button is supported only by the staple, and only the staple has a guide or raceway; and also in accordance with my invention the staple and button are attached before the staple is driven into the material.

I am aware that machines have been contrived in which buttons placed in a chute were delivered therefrom singly, to have their shanks entered by tacks delivered from a second independent chute, the tack being driven through the material and thereafter through the eye of the button.

In Fig. 9 it will be seen that the loop or eye of the staple or fastener above the material is quite large as compared with the eye in the shank of the button. If the legs of the staple were only beveled at the points, and had not the preliminary bend in the line  $y y$ , the legs would be liable to bend or cripple unequally, and the points would not be liable each to turn inwardly for equal distance. The movement of the legs of the staple toward each other, derived from the inclined walls of the guide or carrier as the staple is being driven through it and the material, and while the points are being curled inwardly, insures the closer and more uniform approach of the clinched points together and to the central line of the staple.

The driver does not, as heretofore in button-setting machines, completely drive the fastener; but, on the contrary, the fastener is but partially driven, the aim being simply to drive the fastener only far enough through the material to enable its beveled ends to be clinched up into the material, and leaves space between the material and crown of the staple in which the shank of the button is free to move.

To avoid confusion in the drawings, I have shown but three buttons in Fig. 1.

I claim—

1. In a button-setting machine, the raceway to guide staples, combined with the guide or carrier located at the end of the raceway, and adapted to receive the staple with its connected button, substantially as described.

2. In a button-setting machine, the staple-raceway to guide the staples with their connected buttons, combined with the slotted guide or carrier into which the eye of the button, with its attached staple, is directed from the raceway, the anvil-block and die, and with means, substantially as described, to move and force the guide or carrier against the material upon which the button is to be attached, substantially as described.

3. In a button-setting machine, a raceway to guide the staples with their connected buttons, and the clinching-die, and the movable guide or carrier adapted to receive the staple with its connected button from the said raceway, combined with a driver to drive the staple through the guide or carrier into the material and clinch its prongs, substantially as described.

4. In a button-setting machine, the guide or carrier having inclined inner walls for the reception of the staple, and slotted at  $d^3$  for the reception of the shank of the button, substantially as described.

5. In a button-setting machine, the guide or carrier slotted at  $d^3$ , and having its shank recessed at 3, combined with the raceway to conduct the staple into the guide or carrier and direct the legs of the staple downward, substantially as described.

6. The raceway for the staples and their connected buttons, and the guide or carrier located at its end, and the support A', and anvil-block and die, combined with the driver, and with means, substantially as described, to press or force the guide or carrier against the material preparatory to driving the staple from the guide or carrier, as set forth.

7. In a button-setting machine, the support A', the spindle, its arm, and the driver, combined with means to regulate the extent of the descent of the driver, to thus leave more or less of the staple undriven or projecting above the material, as set forth.

8. The support A', the anvil-block and clinching-die, the guide or carrier located at and extended below the end of the raceway, and the staple-raceway to discharge the staples into the said guide or carrier, combined with the driver having beveled faces 14, and slotted at 15 to act upon the V-shaped head of the staple and leave the shank of the button free, substantially as described.

9. In a button-setting machine, the support A', the anvil-bed and its clinching-die, and the spindle and its attached arm, combined with the guide or carrier opened at its side, above its end, to receive the staple, and slotted at  $d^3$ , and raised or lowered by the said arm with relation to the said die, and with a driver to drive the said staple down into and out from the lower end of the said guide or carrier, substantially as described.

10. In a button-setting machine, the raceway to support the attached staples and buttons, the separator having the toe 5 and head 6, and the guide or carrier open at one side, above its end, to receive the points of the staple, and slotted vertically for the reception of the eye of the button, combined with the driver and a clinching-die, to operate substantially as described.

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

EDWARD O. ELY.

Witnesses:

G. W. GREGORY,  
W. H. SIGSTON.