

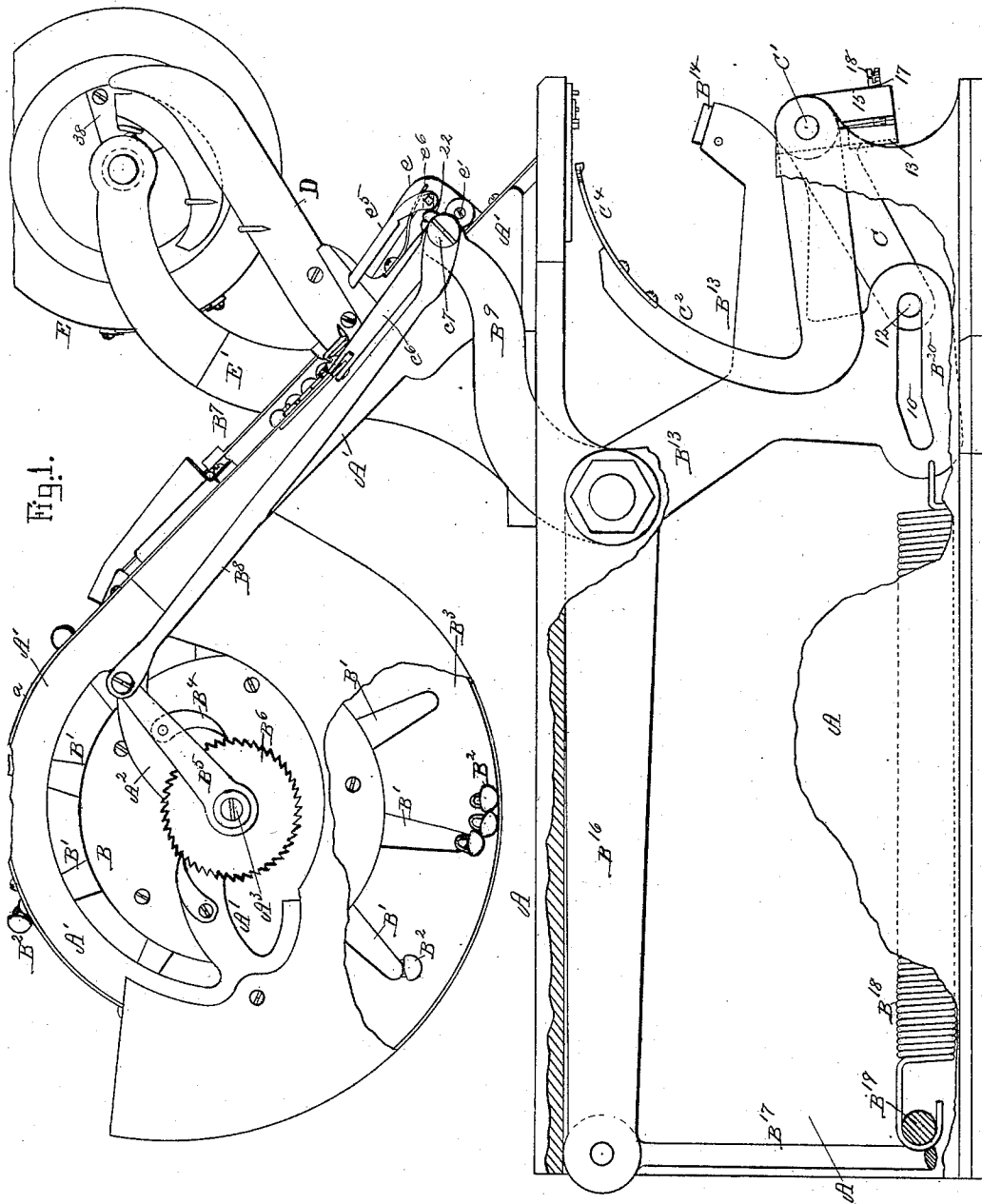
(No Model.)

4 Sheets—Sheet 1.

C. H. EGGLESTON & J. C. WELLES.
BUTTON SETTING MACHINE.

No. 463,292.

Patented Nov. 17, 1891.



Witnesses.

Fred. S. Greenleaf.
Maurice L. Emery.

Inventors.

Charles H. Eggleston,
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by Lemuel Gregory Attys.

4 Sheets—Sheet 2.

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Fig. 3.

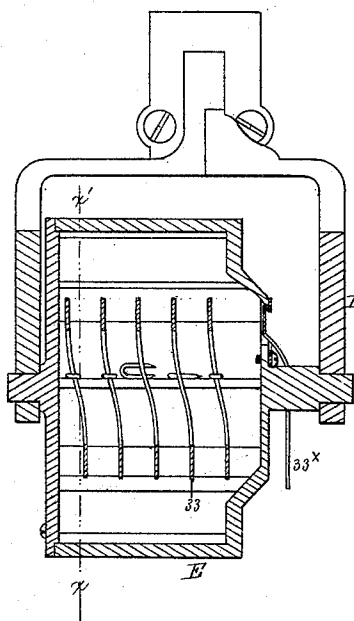


Fig. 4.

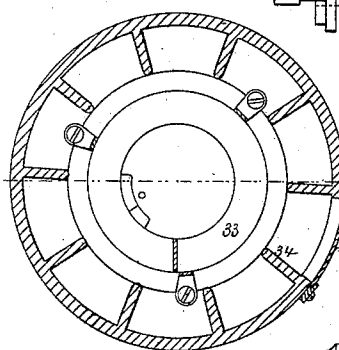


Fig. 2.

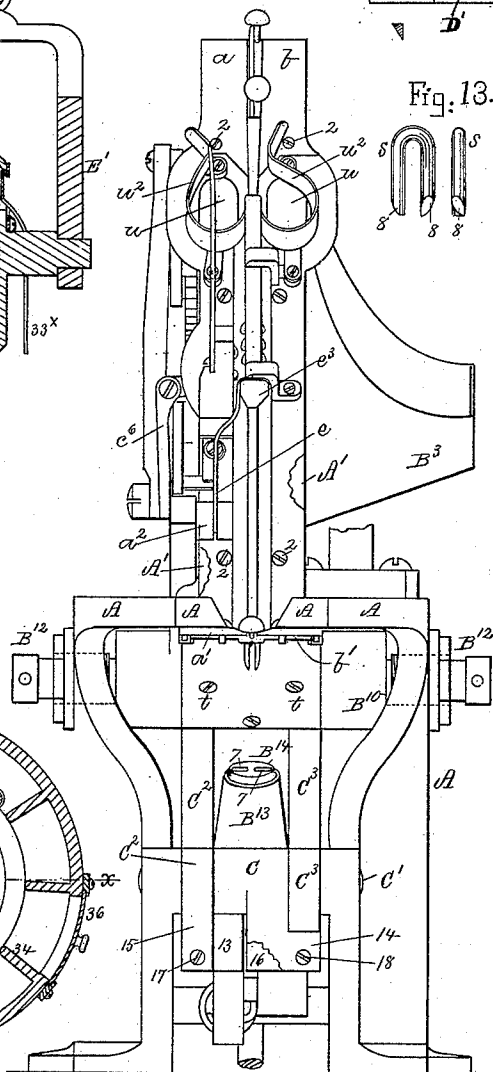


Fig.5.

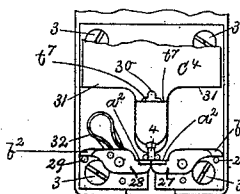


Fig. 6.

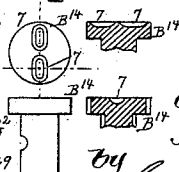


Fig.7.

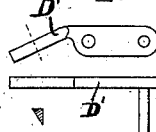


Fig. 13.

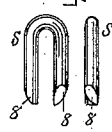


Fig. 8.

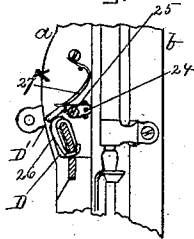


Fig. 9.

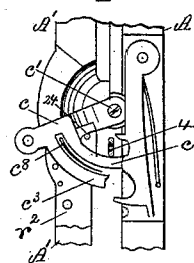


Fig. 10.

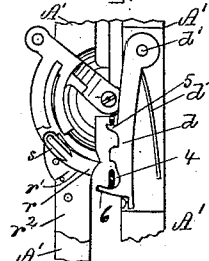
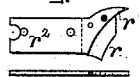


Fig. 11.



Fig. 12.



Witnesses.

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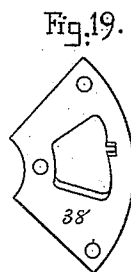
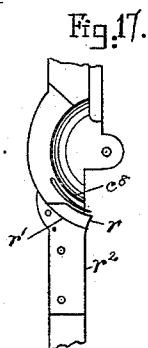
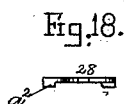
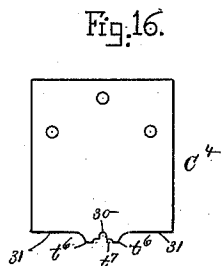
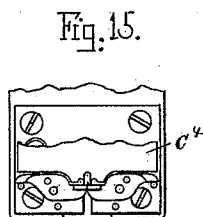
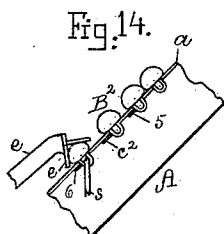
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C. H. EGGLESTON & J. C. WELLES.
BUTTON SETTING MACHINE.

No. 463,292.

Patented Nov. 17, 1891.



Witnesses.

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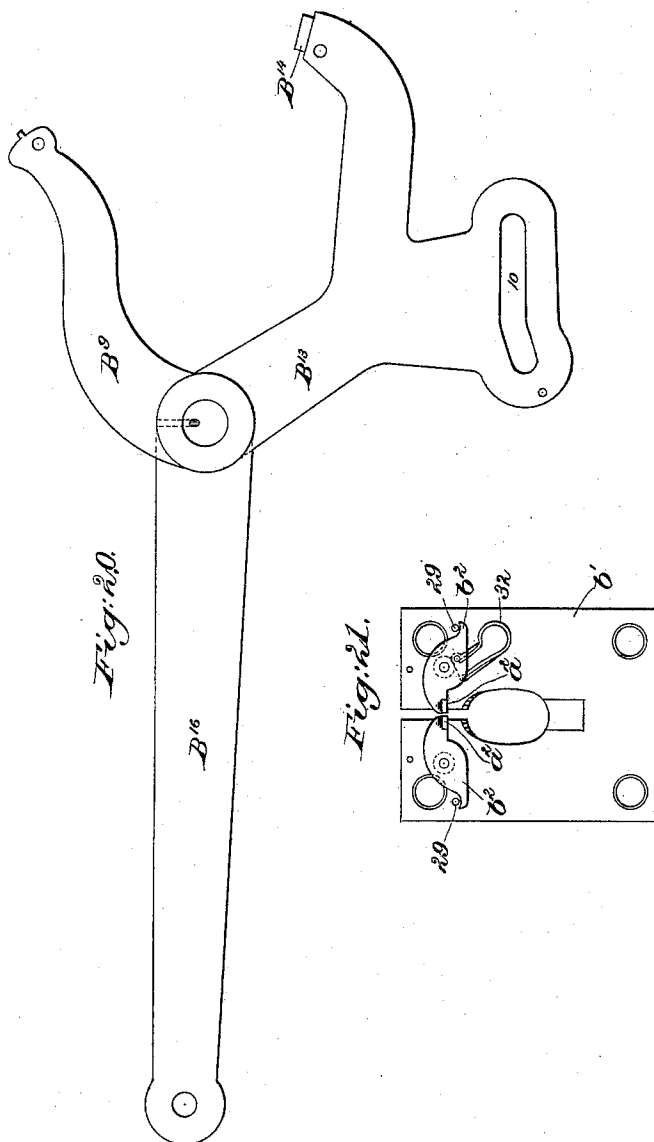
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4 Sheets—Sheet 4.

C. H. EGGLESTON & J. C. WELLES.
BUTTON SETTING MACHINE.

No. 463,292.

Patented Nov. 17, 1891.



Witnesses.

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UNITED STATES PATENT OFFICE.

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OF ONE-HALF TO THOMAS J. O'BRIEN, OF GRAND RAPIDS, MICHIGAN,
AND EDWARD O. ELY, OF BOSTON, MASSACHUSETTS.

BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 463,292, dated November 17, 1891.

Application filed June 9, 1890. Serial No. 354,693. (No model.)

To all whom it may concern:

Be it known that we, CHARLES H. EGGLESTON and JOHN C. WELLES, of Marshall, county of Calhoun, State of Michigan, 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 has for its object to improve and simplify that class of button-setting machines wherein the buttons are secured to the material by staples having two prongs.

In the machine to be herein described the buttons are fed from the hopper into a chute having a slot at its upper side, in which slot the shank-eyes of the buttons rest, and while passing from the upper to the lower end of the chute the shank-eyes have staples pushed into them automatically, the staples after being pushed into the shank-eyes depending therefrom during the remainder of the movement of the shank-eye along the slot of the button-chute into position for the staple to be clinched. The staples, as herein shown, are placed in a hopper having a spiral plate arranged therein after the manner of a worm, one end of the plate being extended out through the end of the said hopper, the said plate serving to pick up the staples and deliver them one after another astride of a suitable saddle-piece, the endmost staples of the saddle-piece being let off one at a time by a suitable gate acted upon, as herein shown, by a part of an arm employed to push the staples into the shank-eye of the button. Each staple just before it is to be pushed or threaded into the shank-eye of a button is by a movement of the gate released from the saddle, so that it falls down upon the arm which is employed to push or thread the staple into the shank-eye of the button, and the said arm as it is moved into its position furthest from the slot in the chute passes out from under the said staple, so that in its next reciprocation in the opposite direction it meets the head of the staple and pushes the same in advance of it in the direction of the chute, so that one leg of the staple which approaches the slot in the chute at an angle thereto enters the

shank-eye of the button and thereafter drops down and hangs pendent from the eye of the shank, while the latter travels the remainder of its distance in the button-chute. The button let-off arrests the shank-eye of each button in position opposite the movement of the arm which pushes the staple-leg into the shank-eye. The slot in the throat holding the shank-eye of the button with the pendent fastening is in a direct line with and substantially the same in width as the slot in the chute, the shank-eye of the button entering the throat by gravity. The pendent staple meets a check device, which arrests it in position to be acted upon at its rear side by a clamping or gripping device, which travels close to the under side of the throat and which co-operates with the check device to grasp the staple between them and hold the same rigidly while the clinching device containing the anvil is raised to force the material laid thereon upon the legs of and clinch the staple. The check device is shown as composed of two pivoted levers, so constructed that when the clamping or gripping device is retracted the operator by pulling upon the material having the button set thereon may draw the shank of the button out from the slot in the throat, the check device at such time turning aside to let the said shank pass out. The two pivoted levers have lips, against which one side of the staple is borne by the clamping-plate, the latter having a notch to receive the staple and also part of the shank-eye of the button, the staple being held rigidly at both sides between the check device and clamping-plate when the material is being forced upon the staple.

The particular features in which our invention consists will be hereinafter more specifically described, and will be pointed out in the claims at the end of this specification.

Figure 1 in side elevation represents a button-setting machine embodying our invention, part of the frame-work and part of the button-hopper being broken out. Fig. 2 is a front or right-hand end view of Fig. 1, the staple-hopper being, however, omitted. Fig. 3 is a horizontal section of the staple-hopper in the line *a*, Fig. 4. Fig. 4 is a vertical cross-section

tion of the said hopper in the line x' of Fig. 3; Fig. 5, an under side view of the throat and the clamping device and check. Fig. 6 shows different views of the anvil-block having the clinching-cavities; Fig. 7, enlarged views and section of the staple-let-off gate; Fig. 8, a detail showing part of the chute with the staple-gate or let-off, the staple saddle-piece being in section, the figure showing part of the arm employed to push or thread the staple into the shank-eye of the button and part of the button let-off. Figs. 9 and 10 show upper sides of the arms or horns which support the plates constituting the button-chute, the said plates being removed. Fig. 11 is an edge view of the arm or staple carrier. Fig. 12 is a detail of the lip-plate detached from the arm A' . Fig. 13 shows a staple such as it is preferred to use in this machine. Fig. 14 is a detail showing one side of the raceway, with a staple hanging from a button therein, the head of the button being arrested by the button-stop; Fig. 15, a detail similar to Fig. 5, but with the clamping-plate closed on the staple. Fig. 16 shows the clamping-plate by itself. Fig. 17 shows part of one of the arms A' , with curved lip attached. Fig. 18 shows one of the check-levers in edge view; Fig. 19, a detail of the plate 38, which receives and guides the spiral plates. Fig. 20 shows in side elevation the clinching-lever detached; Fig. 21, an enlarged view of the throat-plate, with which the slot in the button-race or chute coincides.

The frame-work A of the machine, of suitable shape to sustain the working parts, has two like arms A' , (herein shown as extended upwardly and backwardly substantially parallel to each other,) the shape of the said arms being best represented in Fig. 1, like branches A^2 thereof serving in this instance of our invention to support the shaft A^3 of the button-feeding wheel B , having a series of magnetized arms B' radiating therefrom, the outer ends of the said arms being shown as beveled at both sides in order that they may hold the metal shank-eyes of the buttons at either side thereof and deliver the buttons upon the upper curved ends or portions of the independent plates a b , constituting the button-chute, as the said magnetized arms travel in the slot of the said chute. The plates a b , in one or more pieces, as may be considered most convenient or economical, are extended along the upper sides of the said arms A' to the throat-plate $a' b'$, the said plates having, as shown, each a discharge-passage u for any excess of buttons fed into the slot of the chute or for the escape of any buttons the shank-eyes of which are not properly placed in the chute. These openings u are partially surrounded by curbs u^2 , and the buttons entering the opening fall back into the hopper. The slot in the button-chute or the slot between the edges of the plates a b , in which the shank-eyes of the buttons travel, is coincident with and of substantially the width of

the slot between the plates of the throat, which plates are herein shown as secured to the frame-work by screws 3 3; but the said plates might form a part of the plates a b , as by bending the lower ends of the latter plates to occupy the position represented by the plates $a' b'$.

The buttons B^2 are placed in bulk in a button-hopper B^3 , and as the button-feeding wheel B is rotated by the pawl B^4 of a pawl-carrier B^5 engaging a ratchet-wheel B^6 on the shaft A^3 , the buttons are picked up by the magnetized arms and deposited successively on the plates a b , as shown in Fig. 1, their shank-eyes entering and following in the slot of the button-chute between the edges of the said plates and under a suitable cover B^7 , the shank-eye 4 of each button meeting and being arrested first by a finger 5, (best shown in Fig. 10,) forming part of a button let-off d , pivoted at d' on one of the arms A' , the said let-off having a second finger 6, a spring d^2 normally acting to keep the said let-off with its fingers standing across the slot of the chute down along which the shanks of the buttons travel into setting position. The pawl-carrier B^5 derives its movement from a link B^8 , jointed to an arm B^9 of a rock-shaft B^{10} , adapted to rock in suitable bearings. (Herein shown as center or point screws B^{12} .) The rock-shaft B^{10} has an arm B^{13} , provided with a suitable clinching device B^{14} , composed, as shown, of a block of steel having suitable cavities 7 7, into which enter the points of the legs of the staple s , the said points being made to travel in the said cavities as the staple-legs are clinched into the leather or other material.

We do not intend or desire to limit our invention to the exact form of staple shown, nor to the particular direction in which the legs are turned when being clinched, as they may be turned more or less in any desired direction by properly shaping the points of the staples and the cavities in the anvil. The rock-shaft B^{10} has a third arm B^{16} , which, by a suitable rod or connection B^{17} , is attached to or put under the control of a foot-treadle (not shown) resting on the floor, and through which the operator by his foot may actuate the said rock-shaft and lift the clinching device whenever it is desired to clinch a staple and set a button, a strong spring B^{18} , attached to a stationary rod B^{19} and to a projection B^{20} of the arm B^{13} , normally acting to keep the clinching device depressed, as in Fig. 1, the projection B^{20} having a cam-slot 10 to act on a pin 12 of and vibrate an arm C having a hub provided with ears 13 14 and surrounding loosely a stud C' . The stud C' also receives upon it loosely at the sides of the arm C two legs C^2 C^3 of an arm to which is attached by screws t the clamping-plate C^4 , the said arms being provided, respectively, with lugs 15 16, the lug 15 receiving an adjusting-screw 17, which abuts against the ear 13, while the ear 14 has a like screw 18, which abuts against

the lug 16, adjustment of the said screws enabling the front or acting edge or part of the clamping or gripping plate C^4 , moved by the arm C and acting against the staple, to stop in its forward movement at just the desired point to thereby enable the plate to properly clamp the staple.

The front edge of the clamping-plate C^4 has a projection t^6 , (see Figs. 5, 15, and 16,) which is notched to leave shoulders t^7 to contact with the sides of the staple, a notch 30 being provided to embrace the shank-eye of the button.

The arm A' , to which the chute-plate a is secured, (see Figs. 9 and 10,) is cut away to receive a segmental arm or staple-carrier c , pivoted at c' , the inner end of the said arm being curved downwardly (see Figs. 10 and 11) into a concavity or recess in the arm A' , so that the pivoted end of the said arm will not interfere with the button shank-eyes in the slot of the chute. The arm c has two projections or prongs c^2 c^3 , the one c^2 serving in its inward movement from the position Fig. 10 into the position Fig. 9 to strike against the button let-off d , as shown in Fig. 9, and push it back to free the shank-eye 4 of the button, then resting against the finger 5, as in Fig. 10, and enable it to pass down in the slot of the chute against the prong c^2 , and during this movement of the let-off the prong c^3 acts against the head of a staple to push one of its legs into the shank-eye of the button then resting against the finger 6, as in Fig. 10, on a lip r of a guide-plate r^2 , secured to arm A, and having a curved guiding-wall r' , against which travels one leg of the staple s , the latter being permitted to drop with its under side on the said lip as the prong c^3 of the arm c is retracted from the position Fig. 9 into the position Fig. 10. The slot between the prongs c^2 c^3 embraces a thin segmental plate c^8 . (See Figs. 9 and 17.)

It will be understood that each endmost staple upon the saddle-piece D is permitted to fall in succession upon the prong c^3 when the arm c is in the position Fig. 9, a portion of the arm c at such time acting upon a downwardly-extended pin 24 (see Figs. 8 and 9) at the inner end of the staple-gate or let-off D' , pivoted upon the plate a at 25, the said pin passing through a slot in the said plate to be struck by the arm c when in the position Fig. 9, and cause the outer end of the said gate to retire from the endmost staple, then supported by it on the saddle-piece, and let the staple drop through a slot, as 26, made in the plate a and fall upon the said prong. The gate D' is normally kept closed or in contact with a staple by a suitable spring 27 $\times$. As soon as one leg of a staple has been pushed or threaded through the shank-eye 4 of a button from one side of the chute, the said staple drops or swings down free and hangs pendent from the said shank-eye, as in Fig. 14. As the arm c is moved to push a staple s into the eye of a button-shank, a button-stop e acts on the head of the button and

holds it in place, and as soon as the staple has been pushed into said eye the prong c^2 acts on the let-off d to push it back, thereby removing the finger 6 from in front of the said shank-eye, letting the said button descend in the chute.

The button-stop e is shown as a lever pivoted at e' on a stand e^2 , mounted on the plate a , the upper end of the said lever having a downturned lip or point e^3 . The lever e has a connected arm e^5 and a spring e^6 , the tendency of which is to keep the button-stop down in position to meet the head of and detain a button in the slot of the chute; but when the clinching device B^{13} is in its lowest position, as in Fig. 1, a projection 22 of the arm B^9 acts against the under side of the arm e^5 and lifts it and the lever carrying the button-stop, so as to release the button previously held by it and let the same with its pendent staple travel down the button-chute into the slot of the throat and against the staple-check, to be described, the said staple hanging pendent during such movement and swinging freely below the chute; but as soon as the clinching device is lifted to clinch a staple the button-stop referred to is quickly lowered or moved toward the chute, so as to be in position to stop the button, the shank of which is being provided with a staple, and hold it while the clinching operation is being effected upon the staple depending from a button previously let into the throat.

The segmental arm c derives its movement from a link c^6 , connected to the same stud c^7 employed to connect the link B^8 to the arm B^9 .

The check device herein referred to (see Fig. 5) is composed of two levers 27 28, pivoted upon the plates a' b' , constituting the throat, each of the said levers having a downturned lip a^2 , (see Fig. 18,) against which the side of the staple s arrives after entering the throat.

Fig. 5 shows one of the staples with the two legs in contact with the check device, and with the staple in this position the clamping-plate C^4 is moved forward into the position Fig. 15 by the action of the cam-slot 10 on the pin 12 of arm C, and said plate acts against the opposite sides of the legs of the staple, the notch t^7 made in the end of the said plate C^4 embracing the staple, while the notch 30 embraces the end of the button-shank.

Referring to Fig. 15, where the clamping-plate is shown as moved forward, it will be noticed that the shoulders 31 thereof act upon the outer ends of the levers 27 28 and cause them to stand firmly, their ends abutted against the stops 29.

When the parts are in the condition Fig. 15, the staple is clamped firmly at its sides between the levers 27 28 and the plate C^4 , and at this time the clinching device B^{13} , with its anvil, is raised to force the material upon the staple while the said staple is held rigidly, as represented in Fig. 2.

Prior to our invention it has been customary to maintain the staple in vertical position by pulling upwardly upon or lifting the button by springs or wedges, thus holding the staple while the material was being forced upon the legs of the staple or the legs of the staple forced through the material. The lever 28, forming part of the check for the staple, is acted upon by a spring 32, which normally keeps the said lever in its position shown in Fig. 5; but after the staple has been clinched and the clamping device C⁴ retracted, the operator, by strain put upon the material, may pull the shank 4 of the button-eye out through the slot in the throat and between the inner ends of the levers 27 28, they turning at such time upon their pivots. The spring 32, by keeping the lever 28 in a position substantially at right angles to the slot in the throat, always serves to arrest the staple in driving position, and it is not necessary to nor is the machine provided with any device to act upon either the button, its shank, or upon the staple to feed the same in the slot of the chute or in the slot of the throat, yet if desired or considered necessary a finger or prong might be employed for such purpose, as such device is old and common in other button-setting machines.

We have shown a staple-hopper E, which is composed, essentially, of a drum having journals to rotate in a yoke E', suitably supported upon the frame-work of the machine. This staple-hopper contains a narrow metal plate 33, (shown as arranged in spiral form and having one end 33^x, see Fig. 3, extended out through the end of the hopper,) the interior of the drum being provided with a series of partitions or ribs 34. In the rotation of the drum the ribs by lifting the staples aid in lodging them upon the edges of the spiral plate, and in the rotation of the drum the staples slide along the plate and are delivered from the end 33^x upon the saddle D, down which they slide to the gate D', by which they are let off, as described.

The hopper has a suitable door 36. The opening in the hopper E, through which the end 33^x of the plate passes, is partially closed by a plate 38, which acts to prevent the escape of the staples, the said plate having a notch, as shown in Fig. 19, to receive the back edge of the extension 33^x as it leaves the drum. The hopper E may, however, be omitted and the staples be placed upon the saddle in any usual way.

In this invention it will be noticed that the shank-eyes of the buttons hang in a slot between two plates or bars on which the heads of the buttons rest, and as the said shank-eyes travel along in the said slot they are temporarily arrested in succession and without any change in the position of the buttons on the said plates or bars supporting them, or without any change of direction of travel of the shank-eye and button, and while the said eye is in the same slot it has a staple-leg pushed

or threaded into it, the said leg entering the said shank-eye in a direction nearly at right angles to the length of the slot in which the shank-eye of the button stands; and it will also be noticed that after the said staple is pushed or threaded into the said shank-eye the staple swings down clear of the chute and hangs pendent from the shank-eye while the latter continues its downward motion in the same slot into the throat, in which it is held while the staple is being clinched.

We are aware that it is not new to insert a fastening into the shank-eye of a button when the said eye is in contact with the material into which the fastener is to be driven to secure the button thereto, as in United States Patents Nos. 308,769 and 316,724.

In this invention the staples do not enter and they are not guided in the vertical chute or guideway, and we are aware that staples with buttons connected to them have been made to travel in a guide-tube into position to be clinched in the material, the staple being driven out of the guide-tube by a driver shaped to act on the crown of the staple.

We are also aware that it is not new to hold a button and connected pendent staple in one jaw or member of a button-setting machine while the other member holds and presents the dies by which to clinch the staple-legs.

We claim—

1. A button-setting machine containing the following instrumentalities, viz: a button-conducting chute having a slot in which the shank-eyes of the buttons travel while the buttons rest by gravity on the chute, an independent staple saddle or chute to guide the staples to the button-chute to meet buttons therein, a let-off having a finger to arrest the shank-eyes of the buttons in succession in the said button-chute, a staple-moving arm to act directly upon each staple in succession and push one leg thereof into a shank-eye of a button in the button-chute and leave the staple pendent from the shank-eye below the button-chute, a button-stop *e*, a throat communicating with the button-chute, the check device, and a clamping or gripping device co-operating with the said chute to hold the button in place and the legs of the staple in driving position below the said chute and staple-clinching devices, to operate substantially as described.

2. In a button-setting machine, a button-chute having a slot for the reception of the shank-eye, a let-off to arrest the button shank-eye, a staple-moving arm or carrier having a projection *c*³, to act upon the head of and push the leg of a staple into a shank-eye of a button, and a projection *c*², to substantially at the same time act on and push back the let-off *d*, having the finger to stop the button shank-eye, said projection retaining the button, while the projection *c*³ pushes the staple-leg into the eye of the foremost button, substantially as described.

3. In a button-setting machine, a button-

chute having a slot for the reception of the shank-eye, a let-off to arrest the button shank-eye, a staple-moving arm or carrier having a projection c^3 , to act upon the head of and push the leg of a staple into a shank-eye of a button, and a projection c^2 , to substantially at the same time act on and push back the let-off d , having the finger to stop the button shank-eye, and a stop, as e , for holding the head of the button while the shank-eye thereof is being provided with a staple, substantially as described.

4. The plate a , forming part of the button-chute, the staple-saddle, located substantially as described, to deliver its staples through a hole in the said plate, combined with the arm c , adapted to receive the side of the staple against it, and means to move the said arm to withdraw it from under the staple and place the end of the prong c^3 of the arm back of the head of the staple, the prong c^3 of the said arm thereafter pushing the staple before it and through the shank-eye of the button, as described.

5. In a button-setting machine, the throat and check device, composed of two pivoted levers 27 28, to check the staple substantially in driving position, combined with the recessed clamping or gripping plate to press against the staple and clamp it firmly between itself and the check device, substantially as described.

6. In a button-setting machine, the throat and check device, composed of two pivoted levers 27 28, to check the staple substantially in driving position, combined with the recessed clamping or gripping plate to press against the staple and clamp it firmly between itself and the check device, and with the staple-leg-clinching device, substantially as described.

7. In a button-setting machine, the plates a b , forming the slotted ways for the shank-eyes of the button, and the rocking arm c , provided with the prongs c^2 c^3 , combined with the let-off d , having the points 5 6, and a spring to actuate the said let-off d in one direction, substantially as described.

8. In a button-setting machine, the combination of the revolving hopper E , having the shelves 34 and an opening at one end, the spiral plate 33, having one end extended out

through the end of the said hopper, the plate 36, and the saddle D for receiving the staples from the projecting end 33 of the said spiral plate, substantially as described.

9. In a button-setting machine, a slotted chute to receive the shank-eyes of buttons, an intercepting guideway for a staple, a staple saddle or chute in communication with the said guideway, and a movable arm to act directly against the crown of the staple and push it along the said guideway to place one leg of the staple in the eye of a button, combined with a let-off at the under side of the raceway to act on the shank-eye of the button, and with a stop e , having a lip, as e^3 , above the button-chute, to act on the head of the button while the said arm works to put a staple into the button-eye, substantially as described.

10. In a button-setting machine, a staple saddle or chute, a guideway in communication therewith, a let-off D' , to let the staples off singly from the said saddle into said guideway, and a button-chute, combined with a movable arm to push a staple from said guideway into the eye of the button in the button-chute, substantially as described.

11. The saddle D to receive and guide the staples, a gate or let-off D' to let the staples off singly, a button-chute having a let-off provided with a finger 6, and an arm to act upon the head of a staple and push one leg thereof through the shank-eye of the button while the latter rests against the said finger 6, substantially as described.

12. In a button-setting machine, the staple-conducting saddle and gate D' , and the chute, composed, essentially, of the two plates a b , combined with the pivoted staple-moving arm c to push a staple directly into the shank-eye at one side of the button-race, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES H. EGGLESTON.
JOHN C. WELLES.

Witnesses:

ELIAS HEWITT,
C. H. HILLABRANT.