

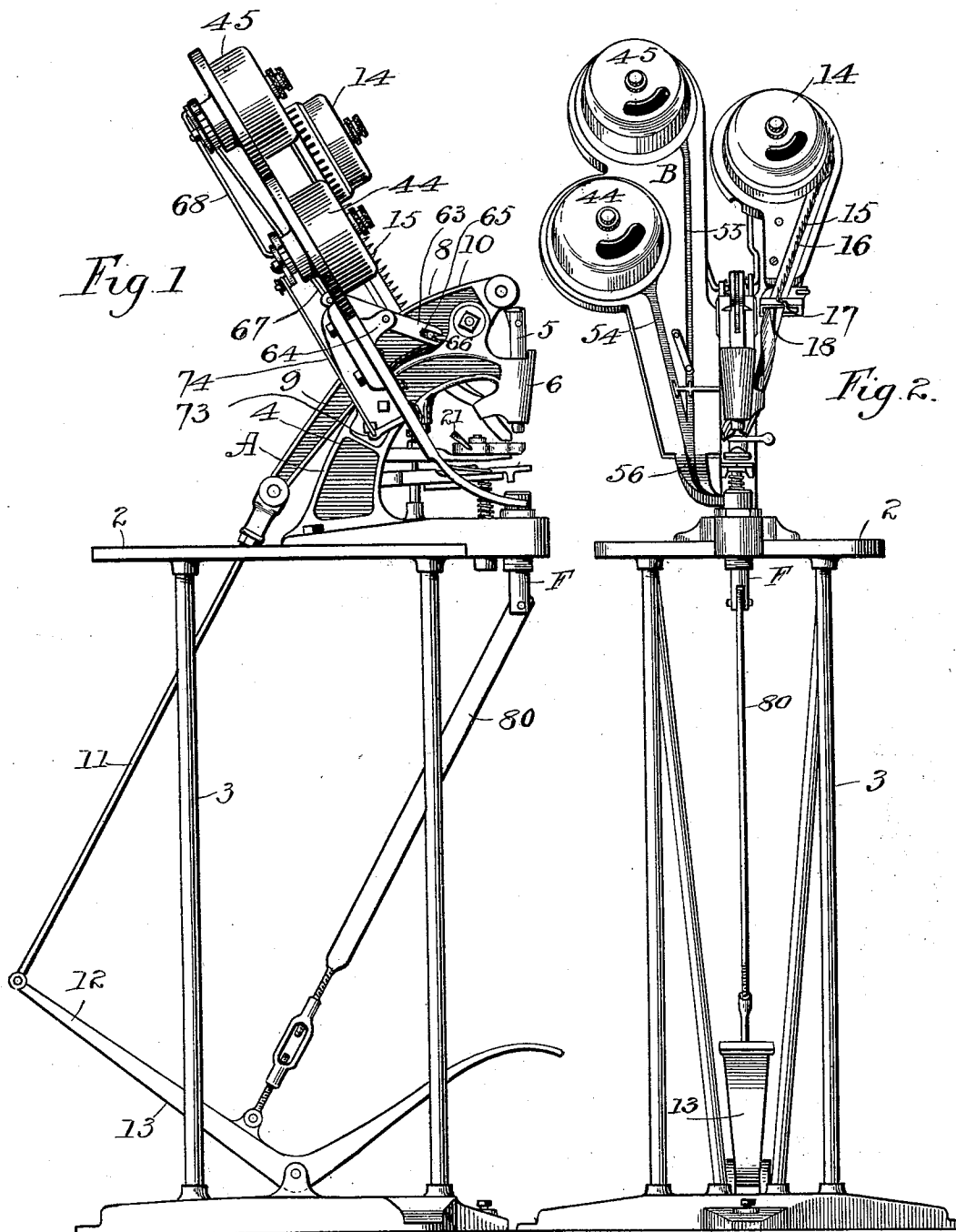
(No Model.)

3 Sheets—Sheet 1.

F. A. RYNO.
BUTTON RIVETING MACHINE.

No. 520,451.

Patented May 29, 1894.



Witnesses:-

W. H. Caldwell
(S. Johnson)

Inventor:-

Frederick A. Ryno,
per: Paul Munn
Attorneys.

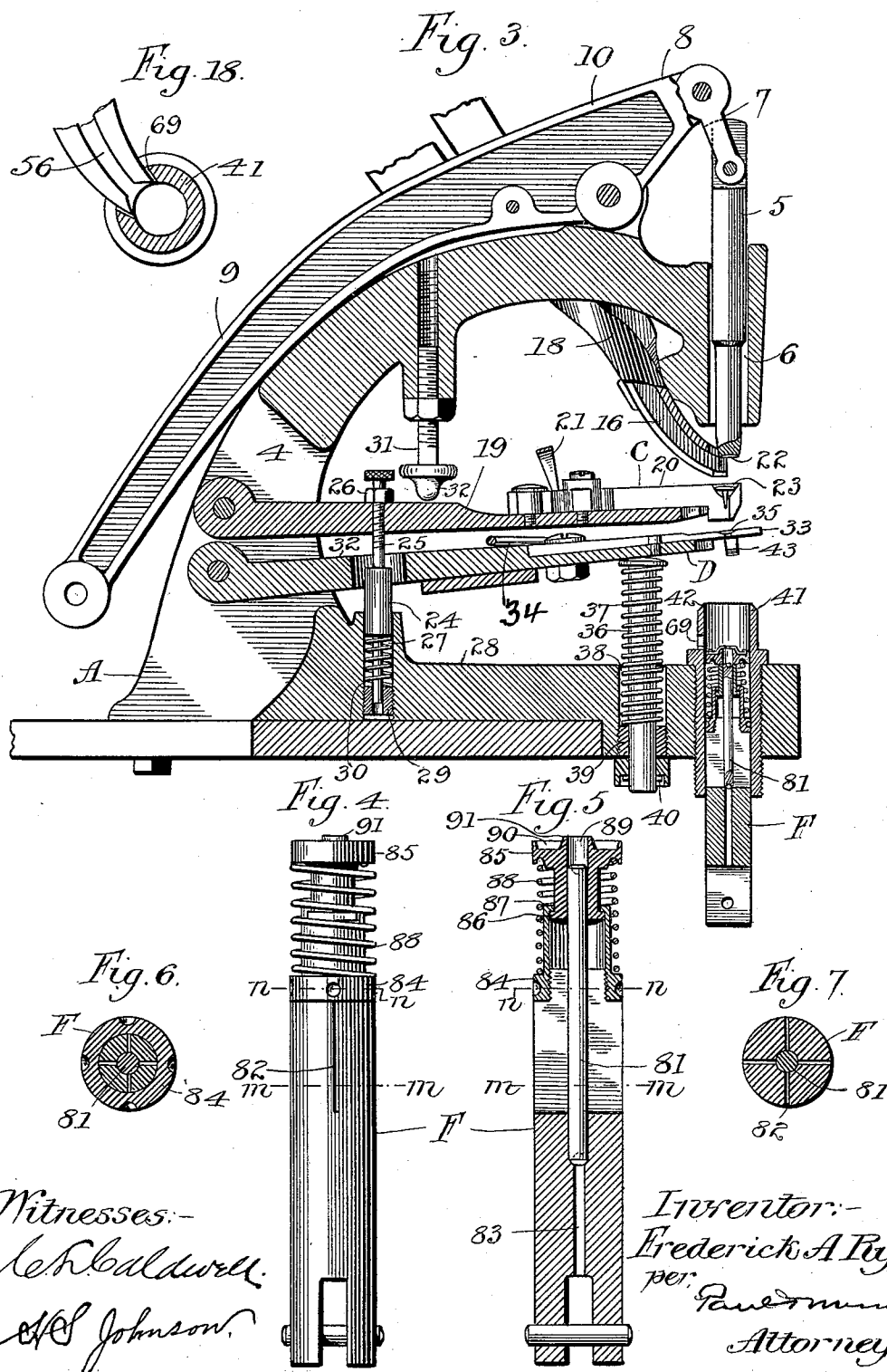
(No Model.)

3 Sheets—Sheet 2.

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3 Sheets—Sheet 3.

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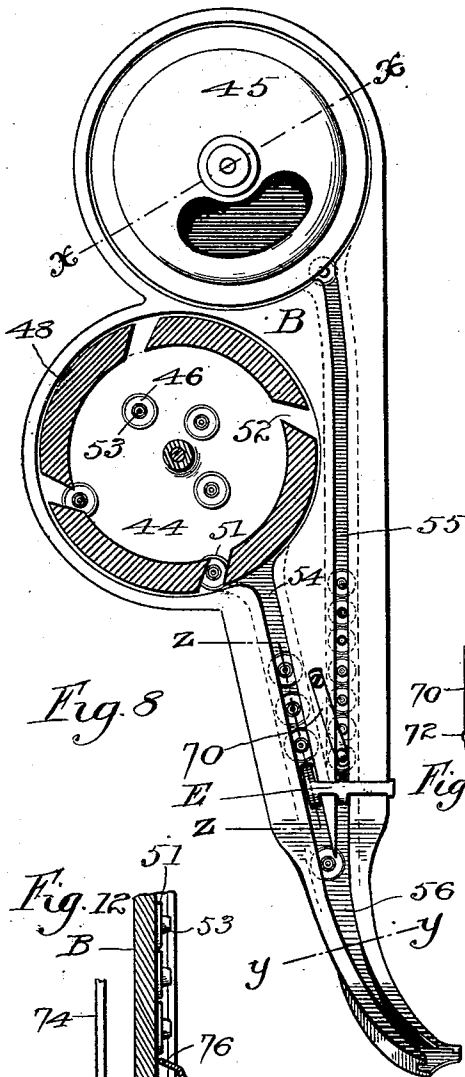


Fig. 14

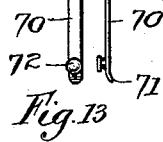


Fig. 13

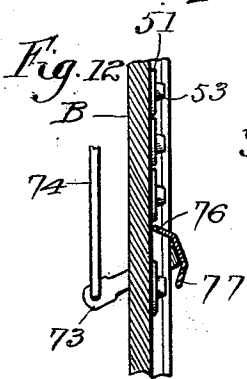


Fig. 12

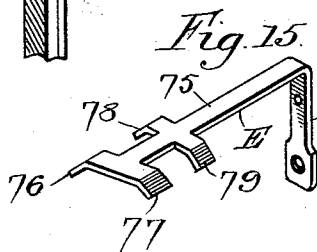


Fig. 15

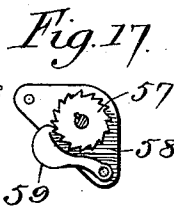


Fig. 17



Fig. 11

Fig. 16

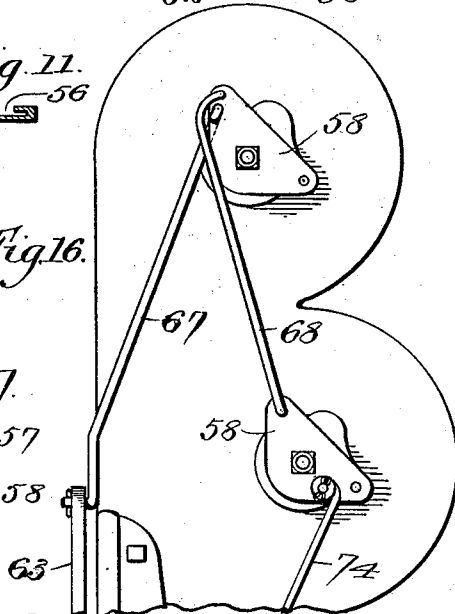


Fig. 9

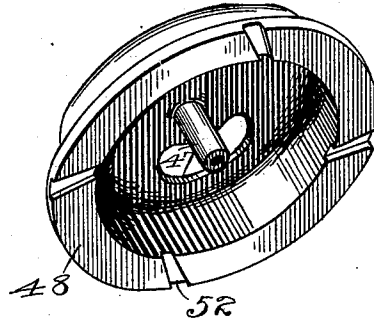
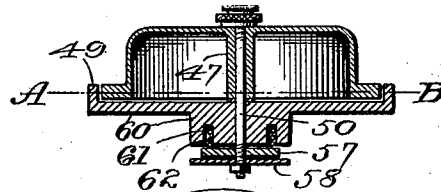


Fig. 10



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Inventor:

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UNITED STATES PATENT OFFICE.

FREDERICK A. RYNO, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF TO
ALVAH H. WARREN, OF SAME PLACE.

BUTTON-RIVETING MACHINE.

SPECIFICATION forming part of Letters Patent No. 520,451, dated May 29, 1894.

Application filed May 25, 1892. Serial No. 434,256. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK A. RYNO, of St. Paul, Ramsey county, Minnesota, have invented certain Improvements in Button-Riveting Machines, of which the following is a specification.

My invention relates to machines designed for the riveting of buttons on garments; its object being to provide a machine which will automatically deliver both buttons and rivets to the riveting mechanism where they are successively secured to the garment by simply working a treadle thus dispensing with the necessity of handling or placing them in position or performing any other mechanical work than the placing of the garment in proper position in the machine.

To this end my invention consists in providing in combination with a rivet receptacle having a conduit adapted to deliver the rivets to the required position for application to the garment, other similar receptacles adapted to hold buttons also provided with conduits leading to the riveting mechanism. These receptacles are provided with devices whereby with each operation a button and a rivet are delivered into the required position for use.

My invention further consists in providing a movable anvil, or vertically acting plunger, upon the end of which the button is delivered from the conduit, and by which it is carried upward and brought into engagement with the rivet holding attachment the parts being brought together with any desired pressure by the action of the treadle, so as to drive the rivet downward through the fabric and to the button beneath.

My invention further consists in the combination and construction hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a side elevation, and Fig. 2 is a front elevation of my device. Fig. 3 is a detail sectional side elevation of the riveting mechanism. Fig. 4 is an elevation of the lower or button plunger. Fig. 5 is a central longitudinal section of the same. Figs. 6 and 7 are cross sections of the same. Fig. 8 is a sectional detail of the button re-

ceptacles and conduits. Fig. 9 is a detail of the under side of the button receptacle as shown detached from the base. Fig. 10 is a cross section of one of the button receptacles on line X—X of Fig. 8. Fig. 11 is a cross section of the button conduit shown on line Y—Y of Fig. 8. Fig. 12 is a section detail of the button conduit shown on line Z—Z of Fig. 8. Figs. 13 and 14 are details of the button switch. Fig. 15 is a detail of the button releasing mechanism. Fig. 16 is a detail of the attachments for rotating the button receptacles. Fig. 17 is a detail of the ratchet attachment on the shaft of the button receptacle; and Fig. 18 is a detail of the end of the main conduit and the cylinder to which it leads.

In the drawings 2 represents a suitable table or bed supported on a frame or standards 3 and on which are supported the operating parts of the machine. Firmly secured upon the bed 2 is the frame A, the overhanging arm 4 of which is provided with the plunger 5 working in the guide 6. This plunger is connected by the link 7 to the fulcrum end 8 of the lever 9 which is pivoted to the arm 4. The power end 10 of the lever is provided with the connecting rod 11 leading to the fulcrum end 12 of the treadle lever 13, so that by depressing the treadle the plunger 5 is driven downward along the guide 6. Securely bolted to the frame A, as shown in Fig. 1, is the inclined base or bed B, upon which is arranged a receptacle 14, adapted to hold a supply of pointed rivets 15, by means of which the buttons are secured to the garment.

Leading from the receptacle is the conduit 16, of inverted T shape, down which the rivets slide with their points projecting upward through the slot of the conduit. This conduit is provided with a gate 17, adapted to be actuated by each operation of the treadle through suitable connections (not shown) so as to pass the rivets one by one. The lower end of the conduit has a spiral twist 18, by means of which the rivets are reversed and delivered to the holder C, point downward. This holder is made up of the arm 19 pivoted to the frame A, and fitted with the pivoted jaws 20, the spring 21, tending to hold them closed together. The end of the plunger 5 has a recess or socket 22 adapted to fit upon

the head of the rivet 15 when driven down upon it. The jaws 20 are cut away on their meeting faces so as to form the tapering socket 23, in which the rivet is received from its conduit, as shown in Fig. 3. When the plunger descends it engages the head of the rivet forcing it down between the jaws, which spread apart against the tension of their spring to allow the rivet and plunger to pass.

In order to adjust the normal position of the arm 19, and elastically supported therein, I provide the plunger 24 adjustably connected to the arm by means of the spindle 25 secured therein, by the set nut 26. This plunger is arranged in the opening or guide 27 in the base 28, the lower end of the spindle 25 working in a hole in the plug 29 at the bottom of said opening, a spring 30 being interposed between said plug and the plunger, and tending to lift the arm. The limit of upward movement of the arm is adjustably fixed by means of the set screw 31 threaded into the arm 4 with its head 32 bearing upon the top of the arm 19.

Immediately beneath the holder C is a similar holder D having the arm 32 also pivoted to the frame A, and the jaws 33 controlled by the spring 34, and adapted to receive in a counter-sunk opening 35 between them the rivet 15 as forced downward by the plunger 5, and through the fabric of the garment which is placed on top the holder D as hereinafter described. The arm 32 is held normally in raised position, as shown in Fig. 3, by means of the plunger 36 actuated by the spring 37 which rests in the socket 38 in the base 28, the plunger working through an opening in the plug 39 at the bottom of the socket, the upward movement of the plunger being limited by the pin or stop 40 bearing against the bottom of the plug. Rigidly fixed to the base 28, is the vertical guide or cylinder 41 directly underneath the plunger 5. The top of this cylinder has the beveled edge 42, and the jaws 33 have beveled lugs 43 which are adapted to strike upon the beveled edge 42 when thrust downward and so be separated thereby to permit the button to be brought against the fabric from beneath, as hereinafter described.

Arranged upon the bed B, are the receptacles 44 and 45 for different sized buttons 46. These receptacles are of inverted cup shape, as shown best in Figs. 9 and 10, having the hollow central posts or standards 47, bearing upon the plate and supporting the flanged edge 48, slightly above the base, the annular rib 49 upon the base projecting above and enclosing the flange. The shafts 50 extending through the standards and base pivotally secure the receptacles in place. The space between the flange 48 and the base is sufficient to admit the edge of a button and transverse notches 52 of such width as to admit the hub 53 of the button form discharge outlets for the buttons, as shown best in Fig. 8.

Leading from the receptacles are the in-

verted T shaped guides or grooves 54 and 55 along which the buttons pass downward to the main conduit 56 and thence to the riveting mechanism, the hubs upon the buttons projecting outward between the sides of the grooves, and the edges of the buttons projecting underneath the sides, as shown in Fig. 8. In order to turn the receptacles so as to carry the outlets successively past the openings to the conduits, and discharge the buttons therefrom into the conduits, I fix upon the shaft 50 of the receptacle, underneath the base, a ratchet 57, outside of which is pivoted the lever 58 carrying at one end the pawl 59 engaging the ratchet. The projection or hub 60 upon the under side of the base B through which the shaft 50 passes, is provided with an annular groove 61 in which is arranged a spring 62 in bearing contact with the ratchet, the tension of which produces sufficient friction between the parts to prevent the receptacle from turning loosely on its shaft and only as actuated by the mechanism hereinafter described. The lever 63 pivoted to the standard 64 upon the base B, has a slotted end 65 which engages a pin 66 upon the lever 9, as shown in Fig. 1. The other end of the lever is connected by the link 67 to one of the levers 58 which in turn is connected by the link 68 to the lever upon the other shaft 50. These connections are so adjusted that with each movement of the treadle to operate the lever 9, the pawls 59 are operated to turn the ratchets and the receptacles thereto attached, carrying one or more of the outlets 52 past the conduits and delivering the buttons into the same so that they are constantly charged. The main conduit 56, at the lower part of the base plate B, is curved laterally and upward, and leads to the slot 69 in the side wall of the cylinder 41, through which slot the buttons are delivered from the conduit into the interior of the cylinder. As buttons from only one of the conduits 54 and 55 can be used at the same time, I provide a switch arm 70 pivoted to the base intermediate of the converging conduits, and having a downward turned point 71. This switch can be swung to and fro by means of its handle 72, so as to interpose its point in one of the conduits, to engage and stop the lower button of the series and thus close the conduit. As shown in Fig. 8 the conduit 55 is closed by the switch, while the conduit 54 is open, the buttons therein being free to descend.

In order to deliver one button only from the connected branch conduit into the main conduit, with each operation of the treadle, I provide the gate E which has a down turned arm 73 pivoted to the side of the base B, the end of the arm being connected by means of the link 74 to one of the pivoted levers 58. The horizontal member or arm 75 has a pair of fingers 76 and 77 projecting downward into the conduit 54 and a similar pair of fingers 78 and 79 in the conduit 55, the space between the down-turned ends of each pair of

fingers being sufficient to receive a single button. When the arm 75 is rocked in one direction the upper fingers are turned outward to permit a button to pass underneath in the open conduit into contact with the lower fingers by which it is stopped. With the reverse movement of the arm 75 the upper finger is depressed into the conduit, and the lower one raised thus permitting the button to escape from it and to descend into the main conduit, the buttons above in the branch conduit being stopped by the depressed upper fingers. This operation is illustrated clearly in detail Fig. 12.

Working in the cylinder 41 is the plunger F, the lower end of which is connected by means of the rod 80 to the fulcrum end of the treadle lever 13, by means of which it is reciprocated in the cylinder. This plunger is provided with an axial bore or hole to receive a pin 81. This hole is slightly smaller than the pin, and the side walls of the plunger are provided with longitudinal slots 82 which permit the wall to spread to admit the pin and to tightly clutch it in place. This hole is reduced in the lower part of the plunger forming the opening 83, in which a tool may be inserted to force the pin 81 out when necessary. On the upper end of the plunger is threaded the sleeve nut 84 within which is arranged the head 85, a flange 86 upon the lower end of the head engaging a corresponding flange 87 upon the sleeve, and securing it therein. The spiral spring 88 surrounding both, tends to keep the head raised to its limit as shown in detail Fig. 5. This head has an axial opening 89 in which the upper end of the pin 81 slides. The top of the head 85 is provided with an annular groove 90 to receive the button, the hub of which fits over the stud or central projection 91. The normal position of the top of the plunger head is just below the opening 69, so that a button delivered from the conduit 56 through the opening will be deposited in place upon the head, and directly underneath the rivet as held in the clutch C.

Operation: The receptacles 14, 44 and 45 and their conduits being filled with rivets and buttons respectively, the switch E is set to leave the conduit filled with the desired size of buttons, open. With the first operation a rivet 15 is released by the gate 17, and delivered into the clutch C, as shown in Fig. 3, and a button is released by the gate E and delivered on to the top of the plunger head 85. The garment is then placed across the top of the clutch D, and the treadle depressed by the foot. The plunger 5 is thereby thrust downward forcing the rivet between the jaws of the clutch C through the fabric upon the clutch D, which is carried downward until its lugs 43, striking upon the beveled edge of the cylinder are forced apart laterally. At the same time the plunger F, is lifted carrying with it the button between the jaws of the clutch D and

into contact with the under side of the fabric, the rivet entering the hole in its hub. The continued pressure upon the treadle forces the plunger F, upward its head being crowded in against the tension of its spring, until the point of the rivet enters the socket in the upper end of the pin 81 and is doubled upon itself and riveted to the button. At the same time, by means of the connections hereinafter described, the button receptacles are turned so as to deliver additional buttons into their conduits. As the treadle is released the plunger 5 is raised and the plunger F lowered to their normal positions, and simultaneously by means of the described connections, the gates 17 and E respectively release another rivet and button, which descend of their own gravity along their conduits into position for another operation.

I claim—

1. In a device of the class described, the combination with the riveting mechanism, of the button receptacles, the main conduit leading to said riveting mechanism, the branch conduits connecting the main conduit with said receptacles, the switch for interposing a stop for the buttons in either branch conduit, the gate for passing the buttons singly from either branch conduit along the main conduit, and means for actuating said gate with each operation of the riveting mechanism, substantially as described.

2. In a device of the class described, the combination with the conduit, of a button gate therefor, consisting of a rocking bar arranged transversely thereof and provided with a pair of downturned points arranged one on each side of the bar and entering the conduit, substantially as described.

3. In a device of the class described, the combination with the conduit, of a button gate arranged therein, consisting of a pair of rigidly connected downturned points, and a support therefor rocking on an axis transversely of the conduit, substantially as described.

4. In a device of the class described, the combination with the inclined base, the main button conduit extending down the same, the branch conduits communicating with said main conduit, and the button receptacles communicating with said branch conduits, of the switch intermediate of said branch conduits adapted to be set to interpose a button stop in either of them, substantially as described.

5. In a device of the class described, the combination with the inclined base, of the main button conduit in the same, the branch conduits diverging from said main conduit and leading to the button receptacles, and the pivoted arm or switch arranged between said branch conduits near their junction, adapted to be turned to carry its free end over either of them, and having a downturned point adapted to engage and stop the buttons there, substantially as described.

6. The combination with the inclined sup-

port and the conduit of inverted T shape extending down the same, of the receptacle of inverted cup shape having a central pivot standard supporting it upon said base, with its edges raised above said base, and having its edges provided with transverse notches, step by step mechanism for rotating said receptacle, and an elastic friction device for holding said receptacle in adjusted positions, substantially as described.

7. In a device of the class described, the combination of the fixed vertical guide, the plunger working therein having a seat to receive a button upon its top, said guide having an opening in the side above the top of said plunger in its normal position, the conduit leading to said opening, and the mechanism for discharging the buttons successively through said conduits, substantially as described.

8. In a device of the class described, the combination of the holder adapted to support the garment, having spring controlled jaws, the rivet holder, the plunger above the same, the fixed hollow cylinder beneath the garment support in alignment with said plunger and having a beveled edge and a lateral button opening, the lugs upon the jaws of said garment support adapted to strike upon said beveled edge and spread said jaws, the plunger working in said cylinder having a seat to receive and hold a button, automatic means for delivering buttons to the opening in said cylinder, and means for simultaneously oper-

ating both said plungers, substantially as described.

9. In a device of the class described, the combination of the fixed hollow cylinder, the button carrying plunger working therein, said cylinder having a slot in its side wall above said plunger in its normal or lowered position, the button conduit leading to said opening, and the gate connected with and actuated from the operating parts of the machine adapted to deliver the buttons one by one along said conduit with each operation of the machine, substantially as described.

10. In a device of the class described, the combination with the inclined bed and the button receptacles mounted thereon, of the branch conduits leading from said receptacles to a common or main conduit, the pivoted arm arranged between said branch conduits and adapted to be turned over either and to stop the buttons therein, the rocking arm extending across said conduits and provided with fingers or downturned points entering said conduits and adapted to hold between them a single button, and means for automatically rocking said arm to release a button with each operation of the machine, substantially as described.

In testimony whereof I have hereunto set my hand this 21st day of May, 1892.

FREDERICK A. RYNO.

In presence of—

T. D. MERWIN,
H. S. JOHNSON.