

No. 639,909.

Patented Dec. 26, 1899.

D. B. SHANTZ.

MACHINE FOR BORING HOLES IN BUTTONS.

(Application filed July 20, 1896.)

(No Model.)

2 Sheets—Sheet 1.

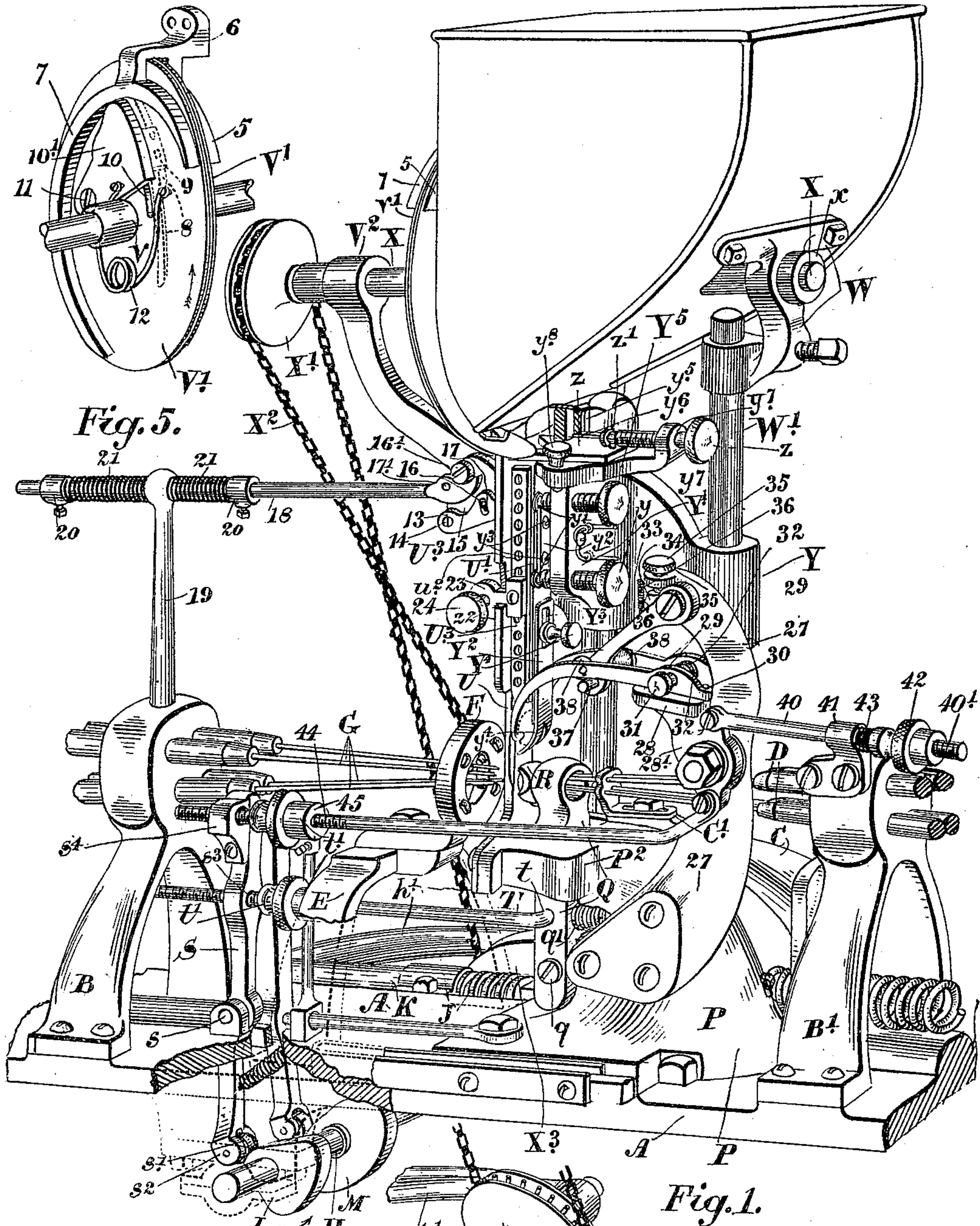


Fig. 1.

Witnesses.

H. J. S. Young

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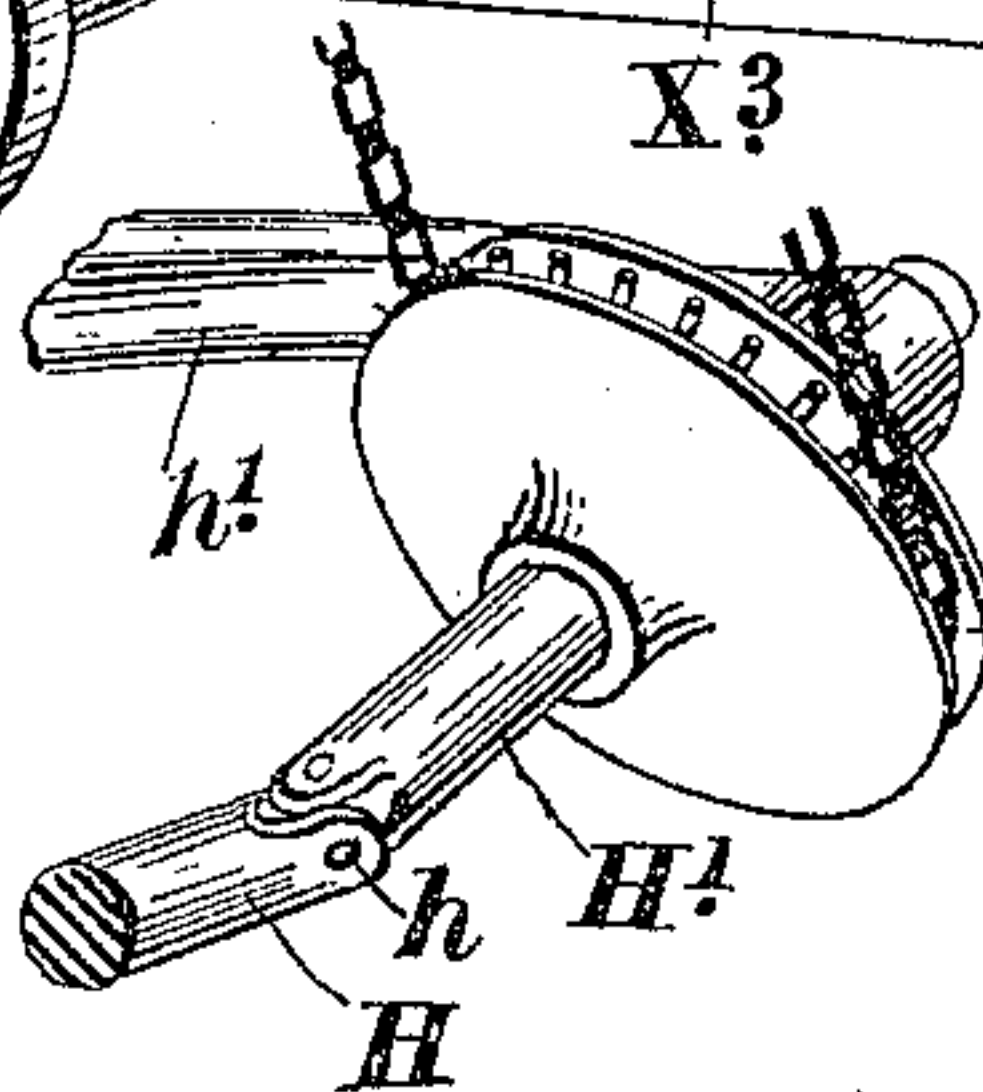


Fig. 6.

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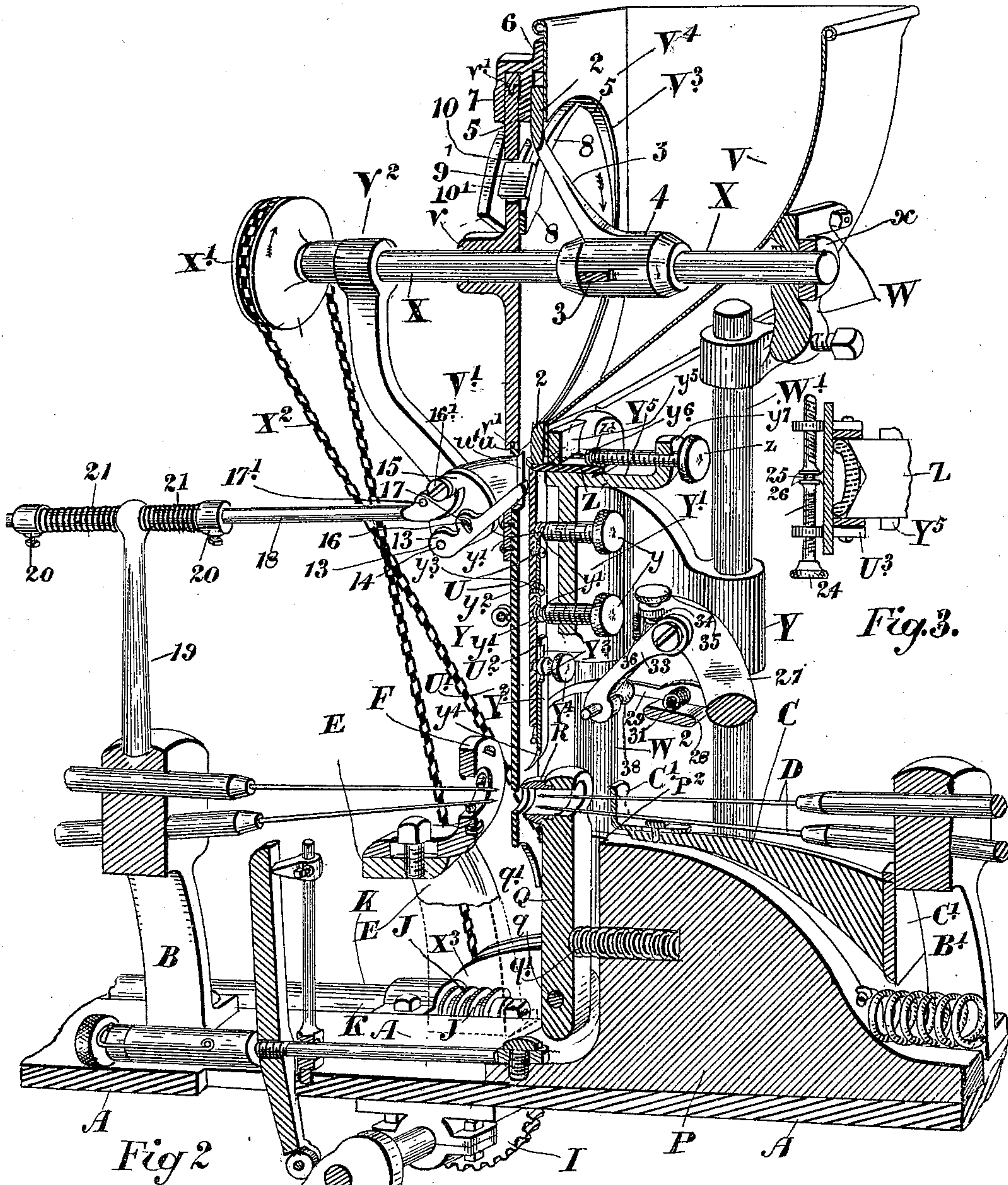
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Witnesses.  
H. L. S. Young-  
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Fig. 4.



# UNITED STATES PATENT OFFICE.

DILMAN BRUBACHER SHANTZ, OF BERLIN, CANADA.

## MACHINE FOR BORING HOLES IN BUTTONS.

SPECIFICATION forming part of Letters Patent No. 639,909, dated December 26, 1899.

Application filed July 20, 1896. Serial No. 599,943. (No model.)

*To all whom it may concern:*

Be it known that I, DILMAN BRUBACHER SHANTZ, manufacturer, of the town of Berlin, in the county of Waterloo, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Machines for Boring Holes in Buttons, of which the following is a specification.

My invention relates to improvements in machines for boring holes in buttons and similar articles patented to me in Canada on the 3d day of October, 1892, and in the United States on the 26th day of December, 1893, under No. 511,364; and the object of my present invention is to provide a convenient automatic means of feeding the buttons into position between the stationary and movable chuck in which they are held for boring, and thereby effect the saving of time and labor and at the same time prevent the frequent spoiling of the button incident to its being fed by hand into position between the chucks; and it consists, essentially, of a chute the lower end of which is provided with a downwardly-extending holding-plate designed to coact with the upper extension of the stationary holding-chuck, peculiarly-operated arms being provided, which are also designed to grip and lower the button into position between the stationary and movable chuck, and, further, in providing at the upper end of the chute a feed-hopper in which the buttons are placed, which hopper is provided with rotating arms designed to facilitate the feed and placing of the buttons from the hopper into their proper position in the chute and the various supplemental parts being otherwise constructed to coact with the above mechanism in the manner hereinafter more particularly explained.

Figure 1 is a perspective view of a portion of my machine for boring holes in buttons, showing the attachment for the automatic feed of the buttons. Fig. 2 is a sectional perspective view. Fig. 3 is a sectional detail of the top of the chute, showing the form of the adjustable selecting-plate to secure the proper deposit of the button from the hopper into the chute. Fig. 4 is a perspective detail showing the means for adjusting the sides of the chute. Fig. 5 is a perspective detail of the front disk of the hopper and the arc-shaped guiding-

rings. Fig. 6 is a perspective detail of the sprocket for driving the rotating arms in the hopper, showing its peculiar connection to the worm-wheel shaft.

In the drawings like letters and numerals of reference indicate corresponding parts in each figure.

A is the bed-plate of the machine, and B B' are the standards, on which are supported the inner ends of the drill-spindles.

C is a bracket having attached thereto an adjustable supplemental bracket C', through which the free ends of the drill-spindles D pass.

E is the standard, at the top of which is supported the adjustable drill-holder F, through which pass the outer ends of the drills G.

H is an arbor which has secured at one end the worm-wheel I, which meshes with the worm J on the main driving-shaft K of the machine. On the arbor H is secured the cams L and M, which regulate the movement of the lever Q, the gripping-fingers for the blank, and the backward-and-forward movement of the carriage P. The carriage P is supported on the base-plate between suitable guideways and given a backward-and-forward movement in the same manner as in my former patents above referred to. The lever Q is pivoted near the bottom at q on the forward end of the carriage P.

R is a chuck secured in the ring-shaped top of the lever Q.

q' is a spiral spring which extends into a recess in the carriage P and is designed to press upon the lever Q.

S is a lever pivoted at s in the lugs forming part of the bed-plate A. The lever S of course extends through the bed-plate and is provided at the lower end with a roller s', journaled in jaws s<sup>2</sup>, which roller is designed to have frictional contact with the cam L.

T is a rod which has a bent end t, which extends into the lever Q. The opposite end of the rod is threaded and is provided with an adjustable collar t'. The threaded end of the rod T extends freely through an opening s<sup>3</sup> in the lever S.

U is a plate secured on the end of the forwardly-extending portion P<sup>2</sup> of the carriage P. The plate U is reduced in size at its upper end and extends vertically upward into the



front side  $V'$  of the hopper  $V$ . The plate  $U$  forms the front side of the chute  $U'$ .

The hopper  $V$  is provided at its exterior with a bracket  $W$ , which is secured to the vertical rod  $W'$ , which extends upwardly from and is secured to the carriage  $P$ . It will thus be seen that the hopper  $V$  is supported by means of the bracket  $W$  and vertical rod  $W'$  upon the carriage.

$X$  is a spindle which extends through the hopper  $V$ , as shown, and is journaled at one end in the bracket  $W$ , in which it is held from moving longitudinally by means of the collar  $x$ . The opposite end of the spindle  $X$  extends through and is secured to the hub  $v$  of the disk  $V'$  at the front side of the hopper  $V$  and an arm  $V^2$ , attached to or forming part of the bracket  $Y$ , which is suitably secured on the vertical spindles  $W'$   $W^2$ . The spindle  $X$  is provided with a sprocket-wheel  $X'$ , which is connected by a sprocket-chain  $X^2$  to a sprocket-wheel  $X^3$ , secured on the extension  $H'$  of the arbor  $H$ . The extension  $H'$  of the arbor  $H$  is connected by a toggle-joint  $h$  to the arbor  $H$  and is journaled at its opposite end in an arm  $h'$ , secured to the frame of the machine. (See Fig. 6.) By means of the cross sprocket-chain  $X^2$  it will be seen that the spindle  $X$  derives its rotation from the arbor  $H$ .

$W^2$  is a vertical rod which is also secured at the bottom to the carriage  $P$  and also extends through the bracket  $Y$ , which it also serves to support. The bracket  $Y$  is provided with an outwardly-extending wing  $Y'$ , through which extend the set-screws  $y$ . The inner ends of the set-screws  $y$  are provided with annular grooves  $y'$ , into which extends the plate  $y^2$ , which is secured by the screws  $y^3$  to the rear side  $U^2$  of the chute  $U'$ . By means of the set-screws  $y$  the rear plate  $U^2$  may be adjusted in relation to the front plate  $U'$  in order to accommodate different thicknesses of buttons.

$Y^2$  is a spring-plate having a forked lower end  $y^4$ , which extends into proximity with the plate  $U$ .

$Y^3$  is a slot in the plate  $Y^2$ , and  $Y^4$  is a set-screw which extends through the slot  $Y^3$  into the plate  $U^2$ , such set-screw being designed to be loosened in order to adjust the height of the forks  $y^4$ .

The upper end of the bracket  $Y$  is formed with a level plate  $Y^5$  above the wing  $Y'$ , such plate having a vertical inner end  $y^5$ , which is provided with a slot  $y^6$ , the bottom of which is formed by the top of the plate.

$y^7$  is the outer upturned end of the plate  $Y^5$ .

$Z$  is a plate which lies upon the plate  $Y^5$  and has a broad V-shaped notched inner end which extends into and forms a guide at one side of the chute  $U'$  in order to insure the convex portion of the button coming down on the side in which the notch is formed and the flat portion of the button going down on the opposite side necessarily. The plate  $Z$  is held down by the top of the slot  $y^6$  and is held

from lateral movement by the plug  $y^8$ . (See Figs. 1 and 3.) The plate  $Z$  is adjusted longitudinally by means of a set-screw  $z$ , which extends through the upturned end  $y^7$  and has a reduced end provided with a knob, which reduced end extends through an eye  $z'$ , attached to or forming part of the plate  $Z$ . By means of the set-screw  $z$  the plate  $Z$  may be adjusted in the chute to accommodate the different thicknesses of buttons.

The disk  $V'$ , hereinbefore referred to, is provided with peripheral grooves  $v'$ , which fit a tongue  $u$  at the top of the plate  $U$ .

$2$  is a ring connected by the arms  $3$  to the hub  $4$ , secured to the spindle  $X$ . The ring  $2$  is located on the outside of the front plate  $V^4$  of the hopper, said ring surrounding the edge of the opening  $V^3$ , made in said plate. The arc-shaped guide  $5$ , forming a part of the bracket  $6$ , which is secured to said front plate  $V^4$ , abuts the outside edge of said ring. The bracket  $6$  straddles the disk  $V'$  and is provided at its outer end with an arc-shaped guide  $7$ , which abuts the disk  $V'$ .

$8$  is a finger which is located at the inner side of the disk and has a plate  $9$ , which extends through a slot  $10$ , made in the disk  $V'$ . The plate  $9$  is attached to or forms part of the detent  $10'$ , pivoted at  $11$  on the outside of the disk  $V'$ .

$12$  is a spring which is fastened at one end to the disk  $V'$  and at the opposite end to the detent  $10$ , the object of the spring  $12$  being to cause the detent to have an outward pressure against the arc-shaped guideway  $7$ .

As the spindle  $X$  is caused to revolve it carries with it the ring  $2$  and disk  $V'$ . The buttons which are in the hopper are kept continually stirred up or, more properly, prevented from wedging or sticking by the arms  $3$ . The buttons are carried down between the ring  $2$  and the disk  $V'$ . If a button should not be carried down with the flat face next the disk and the plate  $U$  and the convex face next the broad V-shaped notch in the plate  $Z$ , it will necessarily stick. In order to remove this button and allow of a button which is properly placed in the top of the chute, to pass down to such chute, I provide, as hereinbefore described, the finger  $8$ , which as the disk  $V'$  revolves is carried around with it and is forced outwardly at the bottom, when the detent  $10$  is relieved from contact with the arc-shaped guideway  $7$ . This outwardly-extending movement of the finger  $8$  will carry the button away from the chute, as such finger will pass out to the periphery of the disk. As the finger  $8$  passes onwardly in its revolution and as the disk rotates in the direction indicated by arrow, such button will be carried upwardly circumferentially until the finger is pressed inwardly through the detent  $10$ , whereupon the arc-shaped guideway  $5$  will carry such button within the vortex of the circularly-moving disk, against which all the buttons are pressing, and such button I find in practice will turn eventually, as will all of the



buttons, and pass down into the chute with the face toward the disk and the convex portion toward the ring, so that such button may pass the broad V-shaped selecting-plate Z.

5 In order to further insure the improperly-deposited button from sticking above the selecting-plate, I provide an arm 13, which is pivoted at 14 on a plate 15 and is also pivotally connected to such plate by a pin 16, extending through a slot 17 in the arm 13. The arm 13 extends upwardly in the position shown in Fig. 2 into a slot  $u'$ , made in the front side of the plate U of the chute U', such slot being a vertical one and preferably extending above and below the lever of the selecting-plate Z. The plate 15 is pivoted on the pin 16' and is connected by a pin 17' to a rod 18, the front end of which is preferably slightly curved, so as to extend around the head of the pin 16', so as to hold the plate 15 firmly on its seat and yet not prevent its swinging movement. The rod 18 extends through a hole in the top of the rod 19, secured in the top of a standard B.

20 are collars secured to the rod on each side of the standard by a set-screw, and 21 are spiral springs extending between the collars and the rod 19. The springs 21 are designed to relieve the pressure from the end of the arm 13.

Upon each forward movement of the carriage, bringing with it the hopper and bracket Y and the coacting mechanism, it will be seen that on account of the end of the rod 18 being pivotally connected to the plate 15, as hereinbefore described, such plate will be caused to swing upwardly toward the chute, carrying with it the arm 13, which will pass upwardly through the slot  $u'$  and poke out any button which would have a tendency to stick against the selecting-plate Z.

It will be seen that the slot 17 in the arm 14 allows of the free upward movement of the inner end of the arm in the chute.

45 The means above described, it will be readily understood, effectually form an auxiliary means for relieving the upper end of the chute from an improperly-placed button.

The chute U is provided with sides  $U^3$ , which have openings or perforations  $u^2$ , so as to enable the operator of the machine to see the buttons as they pass down through the chute. In order to provide for the adjustment of the sides of the chute to accommodate and guide centrally the different diameter of buttons, I provide the following simple arrangement, which is clearly shown in Fig. 4:

22 are notches made in each side of the front plate U of the chute.

60 23 are plates which extend through the notches 22, such plates being secured to the sides  $U^3$  of the chute at the back of the plate U.

24 is the screw-spindle, which extends through the forwardly-extending portions of the plates 23, the spindles being secured from lateral movement by the pin 25, extending between the collars 26, secured to the spindle.

One end of the spindle has a right-hand thread and the other a left-hand thread. It will therefore be readily seen that by turning the knob of the screw-spindle the side plates  $U^3$  of the chute may be adjusted to or from each other, as desired.

In order to provide for the delivery of the button from the bottom of the chute to between the receiving-chucks opposite the boring-spindle, I provide the following mechanism:

27 is an arm which is secured to the carriage P and extends upwardly in the form shown.

28 is a table forming part of the lever 28', pivoted near the upper end, and 29 are curved gripping-fingers which are pivoted at 30 near the arm upon the top of the plate, so that they may have a lateral movement at the free end. The curved free ends of the arms 29 are preferably disk-shaped, as indicated.

31 is a spindle provided with a knob which extends through the fingers 29, being secured to one arm and extending freely through a hole in the other.

32 is a tension-spring which extends between the fingers 29 and through which the spindle 31 extends. The spring 32 is attached to both fingers, and the natural tendency of such spring is to draw the fingers together.

33 is an arm pivoted at the top of the arm 27, and 34 is a boss on such arm.

35 is a set-screw extending through the upper end of the arm and designed to be brought normally against the boss 34 by means of the spiral spring 36, connected to the top of the arm 27 and to the arm 33.

37 is a pin which extends laterally through each side of the arm at the lower end.

38 are disks secured to the inside of each arm, such disks having preferably substantially conical inner sides.

40 is a rod pivotally connected to the lever 28'. The lever 40 has a threaded end 40', which extends freely through the collar 41, secured on the upper end of the standard B'.

42 is an adjusting-nut which is screwed onto the threaded end 40' of the spindle 40, and 43 is a spiral spring which surrounds the threaded rod 40 and extends between the inner end of the nut 42 and the collar 41.

44 is a rod which extends through the laterally-extending upper end  $s^4$  of the lever S. The end of the rod 44 is threaded and is provided with an adjusting-nut 45, as shown.

The operation of the fingers 29 in delivering the button from the bottom of the chute between the chucks is as follows: The fingers 29 are shown in Figs. 1 and 2 in the position after they have gripped the button. After the button has reached the position shown in dotted lines against the bottom end of the spring-arm  $Y^2$  and is gripped as shown the cam L operates on the lever S, rod 44, and lever 28', so as to bring down the fingers 29, with the button in between the ends, past the forked spring-plate  $Y^2$  into position centrally be-



tween the chucks, the chuck R of which is now held open. Immediately this position is reached the cam L will operate upon the rod T and lever Q and allow the spring  $q'$  to close the chuck R and hold the button against the stationary plate U, which is provided with a hole through which the drills operate. At the same time the cam L will be pulling through the lever S and rod 44 upon the lever 28', tilting it in the opposite direction, and carrying up with it the fingers 29, which when the conical disks 38 reach the laterally-extending pins 37 on the end of the arm 36 such fingers 29 will be forced apart momentarily, so as to pass freely the next deposited button above the forked end of the spring-plate  $Y^2$ . After the pins 37 have passed the disks 38 the spring 32 draws the fingers together to grip the succeeding button held by the forked end  $y^4$  of the plate  $Y^2$ . When the fingers 29 are again caused to move downwardly after the button is gripped, as hereinbefore described, it will be readily seen that the conical bosses 38 would slide past the pins 37, extending laterally out from each side of the arm, the spring 32 allowing of the giving of the arm 33 for such purpose.

It will thus be seen that I have provided in my attachment a means for gathering the buttons together successively in their proper relative position to enter the chute, in which they are held one above the other, and means for gripping each button as it passes down beyond the end of the chute and carrying it into position between the stationary and longitudinally-moving chuck. When held between such chucks, of course, the boring is done, and the finished button is deposited or carried off in any suitable manner.

What I claim as my invention is—

1. In a machine for boring holes in buttons, the drills, the receiving face-gripping chucks having two members longitudinally separable, and designed to hold the buttons opposite to the boring-drills, in combination with the chute, and the grippers automatically operated and having a transverse motion to grip the button to carry it to the chucks, substantially as and for the purposes set forth.

2. In a machine for boring holes in buttons, the drills, the receiving face-gripping chucks, having two members longitudinally separable, and designed to hold the buttons opposite to the boring-drills, in combination the chute, and the grippers automatically operated and having a transverse motion to grip the button to carry it to the chucks, and means independent of the chucks for opening said grippers, substantially as and for the purposes set forth.

3. In a machine for boring holes in buttons, the combination with the receiving-chucks for holding the buttons opposite to the boring-drills, of a hopper, a chute leading therefrom, a pair of grippers for carrying the buttons from the chute to the chucks, means for automatically spreading each of said grippers

to inclose the button, and means for contracting the same to grip said button, substantially as described.

4. In a machine for boring holes in buttons, the combination with the receiving-chucks for holding the buttons opposite to the boring-drills, of a hopper, a chute leading therefrom; a pair of grippers for carrying the buttons from the chute to the chucks, means for automatically spreading each of said grippers to inclose the button, said means being interposed between the adjacent faces of said grippers and means for contracting the same to grip said buttons, substantially as described.

5. In combination, the boring-tools, means for holding the buttons to be bored, a chute directly above and in the same vertical plane with the axis of said holding means, temporary holding means for holding the button-blanks after falling from the chute, and means for transferring the buttons past such temporary holding means to present them to the boring-tools, substantially as described.

6. In combination, the tools, holding means to present the blanks thereto, a chute, means for holding the blanks at the bottom of the chute with their peripheries exposed, and means for engaging the peripheries and transferring the blanks from the chute to the holding means.

7. In combination, the boring-tools, means for holding the buttons to be bored, a chute directly above and in the same vertical plane with the axis of said holding means, and means for transferring the button to the boring-tools, substantially as described.

8. In a machine for boring holes in buttons, the combination with means for holding the buttons opposite to the boring-drill, of a chute extending directly over said means and immovable in relation thereto, and a spring-plate held to the side of the chute and having the lower end bent inwardly so as to project into the path of the descending button, and means for transferring the button past the interfering projection to said means, said spring-plate yielding under the action of the transferring means and the blank, substantially as described.

9. In a machine for boring holes in buttons, the combination with the receiving means for holding the buttons opposite to the boring-drills, of a chute extending directly over the opening in the receiving means, a stationary spring-plate and an adjustable means for holding it to the side of the chute, such spring-plate having a lower curved forked end extending into the pathway of the descending button and means for transferring the button directly from the interfering curved bottom end of such spring-plate as and for the purpose specified.

10. In a machine for boring holes in buttons, the combination with the means for holding the buttons, of a stationary chute, a plate having a holding end, and a carrier adapted to grip the button above said end,



and to convey the same past said end to said chucks, substantially as described.

11. In combination, the tools, the reciprocating carriage, holding means for the button comprising a part fixed on the carriage and a part movable relatively thereto, and a chute on the carriage having its delivery end directly over the holding means so that the blank can move in the plane of the axis of the holding means in passing thereto, substantially as described.

12. In a machine for boring holes in buttons, the combination with the receiving-chucks for holding the buttons opposite to the boring-drills, the chute situated directly above the space between the chucks, pivoted fingers having their free ends extending at each side of the pathway of the button and means for closing the levers upon the buttons to carry it down to the chucks and conical disks formed on the inside of the gripping-fingers and an arm spring-held having laterally-extending pins designed to coact with the bosses as and for the purpose specified.

13. In a machine for boring holes in buttons, the combination with the receiving-chucks for holding the buttons opposite to the boring-drills, the chute situated directly above the space between the chucks, pivoted fingers having their free ends curved and extending downwardly at each side of the pathway of the button, the tension-spring for holding the fingers together, cone-shaped disks on the inside of the fingers, an arm with laterally-extending pins designed to coact with the cone-shaped bosses, a lug on the arm, a set-screw extending over such lug and a spiral spring designed to normally hold the lug up against the set-screw as and for the purpose specified.

14. In a machine for boring holes in buttons, the combination with the receiving-chucks for holding the buttons opposite to the boring-drills, the chute situated directly above the space between the chucks, pivoted fingers having their free ends curved and extending downwardly at each side of the pathway of the button, the tension-spring for holding the fingers together, cone-shaped disks on the inside of the fingers, an arm with laterally-extending pins designed to coact with the cone-shaped bosses, a lug on the arm, a set-screw extending over such lug, a spiral spring designed to normally hold the lug up against the set-screw and means for moving the fingers up and down as and for the purpose specified.

15. In a machine for boring holes in buttons, the combination with the receiving-chucks for holding the buttons opposite to the boring-drills, the chute situated directly above the space between the chucks, pivoted fingers, the carriage supporting the stationary chuck, the upwardly-extending arm attached to the carriage, the lever pivoted on the arm, the gripping-fingers independent of said lever arranged with their ends to each

side of the downward pathway of the button supported upon the upper end of the lever and means for opening and closing the gripping ends of the fingers as and for the purpose specified.

16. In a machine for boring holes in buttons, the combination with the receiving-chucks for holding the buttons opposite to the boring-drills, the chute situated directly above the space between the chucks, pivoted fingers, the carriage supporting the stationary chuck, the upwardly-extending arm attached to the carriage, the lever pivoted on the arm, the gripping-fingers arranged with their ends to each side of the downward pathway of the button supported upon the upper end of the lever, means for opening and closing the gripping ends of the lever and means connecting the lever pivoted on the upwardly-extending arm with operating mechanism connected to the arbor as and for the purpose specified.

17. In a machine for boring holes in buttons, the combination with the receiving-chucks for holding the buttons opposite to the boring-drills, the chute situated directly above the space between the chucks, pivoted fingers, the carriage supporting the stationary chuck, the upwardly-extending arm attached to the carriage, the lever pivoted on the arm, the gripping-fingers arranged with their ends to each side of the downward pathway of the button, supported upon the upper end of the lever, means for opening and closing the gripping ends of the fingers and the rod 45, lever S and cam L and arbor H driven as and for the purpose specified.

18. In a machine for boring holes in buttons, the combination with the receiving-chucks for holding the buttons opposite to the boring-drills, the chute situated directly above the space between the chucks, pivoted fingers, the carriage supporting the stationary chuck, the upwardly-extending arm attached to the carriage, the lever pivoted on the arm, the gripping-fingers arranged with their ends to each side of the downward pathway of the button supported upon the upper end of the lever, means for opening and closing the gripping ends of the fingers, means for connecting the lever pivoted on the upwardly-extending arm with operating mechanism connected to the arbor and further means connected to the lever above its pivot for relieving such lever from any undue strain as and for the purpose specified.

19. In a machine for boring holes in buttons, the combination with the receiving-chucks for holding the buttons opposite to the boring-drills, the chute situated directly above the space between the chucks, pivoted fingers, the carriage supporting the stationary chuck, the upwardly-extending arm attached to the carriage, the lever pivoted on the arm, the gripping-fingers arranged with their ends to each side of the downward pathway of the button supported upon the upper end of the



lever, means for opening and closing the gripping ends of the finger, means connecting the lever pivoted on the upwardly-extending arm with operating mechanism connected to the arbor, further means connected to the lever above its pivot for relieving such lever from any undue strain and a rod pivotally connected to the lever above its fulcrum, a collar secured to the standard and designed to receive and support the free end of the rod, an adjustable nut on the threaded end of the rod and a spring between such nut and the collar on the rod as and for the purpose specified.

20. In a machine of the class described, the combination with the chucks, of a plate forming an upward extension of the stationary chuck, the sides, the back and the set-screws extending through a wing, the annular grooves in the end of the set-screw and the plate secured to the back having the ends extending into the annular grooves as and for the purpose specified.

21. In a machine for boring holes in buttons, the combination with the boring-spindles and movable and stationary chucks of a chute situated directly above the space between the chucks and a hopper at the top of the chute having its end reduced to the same size as the chute and means independent of the chute and the hopper and located directly below the hopper for causing the buttons to pass down with their convex sides against the back of the chute as and for the purpose specified.

22. In a machine for boring holes in buttons, the combination with the boring-spindles and movable and stationary chucks, of a chute situated directly above the space between the chucks and a hopper at the top of the chute having its end reduced to the same size as the chute and a plate independent of the chute and located outside of the same said plate having a broad V-shaped end designed to extend into the chute as and for the purpose specified.

23. In a machine for boring holes in buttons, the combination with the chucks, boring-spindles and chute, of a carriage, a spindle supported thereby, a bracket supported by said spindle, said bracket having a lateral extension with an upwardly-turned end, a plate loosely supported on the upper face of said extension, said plate being independent of said chute and adapted to project thereinto and means for adjusting the same, substantially as described.

24. In a machine for boring holes in buttons, the combination with the boring-spindles and movable and stationary chucks, of a chute situated directly above the space between the chucks and a hopper at the top of the chute having its end reduced to the same size as the chute, a plate having a broad V-shaped end designed to extend into the chute, a bracket secured on the spindle and having a flat top upon which the plate rests, means

for adjusting the plate upon such top, an upwardly-extending portion in the front of the flat top and retaining studs or projections on each side of the plate as and for the purpose specified.

25. In a machine for boring holes in buttons, the combination with the boring-spindles and movable and stationary chucks, of a chute situated directly above the space between the chucks and a selecting-plate of suitable shape extending into the chute said plate being independent of said chute and located at the discharge-opening of the hopper as and for the purpose specified.

26. The combination with the hopper, the chute and the movable carriage, of a selecting-plate projecting into said chute and a poke-lever adapted to enter said chute on the forward movement of said carriage to dislodge the button arrested by said plate, substantially as described.

27. In a machine for boring holes in buttons, in combination, the boring-spindles, the chucks, the chute, the slot in the front side of the chute, the finger or arm extending into such slot, the carrier therefor, said finger being movable on said carrier across the face of the same with means for limiting said movement and means for giving it an upward poke as and for the purpose specified.

28. In a machine for boring holes in buttons, in combination the boring-spindles, the chucks, the chute, the slot in the front side of the chute, the finger or arm extending into such slot, the pivoted plate on which the arm is pivoted, the pin extending through a slot in the arm and means for swinging the plate upon the forward movement of the carriage and chute as and for the purpose specified.

29. In a machine for boring holes in buttons, in combination the boring-spindles, the chucks, the chute, the slot in the front side of the chute, the finger or arm extending into such slot, the pivoted plate on which the arm is pivoted the pin extending through a slot in the arm and the rod pivotally connected to a crank-pin on the pivoted plate, collars on the rod, a vertical rod, through a hole in the upper end of which the rod extends and spiral springs between the collars on the rod and the vertical rod as and for the purpose specified.

30. The combination with the frame and movable carriage of a hopper supported from said carriage, the spindle extending there-through, the sprocket carried thereby, the arbor journaled in said frame, the extension of said arbor connected to the main portion thereof by a toggle-joint, the second sprocket-wheel carried by said extension and the chain connecting said sprockets, substantially as described.

31. In combination, the chute, the chucks, the hopper having an inlet into said chute, the central shaft extending through the hopper, the ring, the hub attached to said shaft and the arms extending from said ring obliquely to said hub, said arms being adapted



to move in the bottom of said hopper at the mouth thereof and being adapted to connect said ring and hub and to agitate the buttons within said hopper, substantially as described.

5 32. In combination the chucks, the chute, the hopper, the circular opening in the end of the hopper, the shaft extending through and supported in suitable bearings in the hopper, means for driving the shaft, a disk  
10 secured on the shaft and shiftable means movable with such disk and having also an independent movement for throwing the button within the periphery of the disk as and for the purpose specified.

15 33. In combination the chucks, the chute, the hopper, the circular opening in the end of the hopper, the shaft extending through and supported in suitable bearings in the hopper, means for driving the shaft, a disk secured  
20 on the shaft, the arc-shaped guiding-plates secured above and to the outside of the circular opening in the hopper, the adjustable finger and means between the finger and the arc-shaped guiding-plates for giving it an in-  
25 ward and outward thrust as and for the purpose specified.

30 34. In combination the chucks, the chute, the hopper, the circular opening in the end of the hopper, the shaft extending through and supported in suitable bearings in the hopper, means for driving the shaft, a disk secured on the shaft, the arc-shaped guiding-plates secured above and to the outside of the

circular opening in the hopper, the adjustable finger, the plate attached thereto and  
35 extending through a slot in the disk, a detent connected to the plate on the outside of the disk and the spring for pressing the disk normally against the interior of the arc-shaped  
40 guiding-plate as and for the purpose specified.

35. In combination the chucks, the chute, the circular opening in the end of the hopper, the shaft extending through and supported  
45 in suitable bearings in the hopper, means for driving the shaft, a disk secured on the shaft and the arc-shaped guide secured above the circular opening at the inside of the disk and abutting the same as and for the purpose  
50 specified.

36. In a machine for boring holes in buttons, in combination with the receiving-  
chucks for holding the buttons opposite the boring-drills, of a stationary receptacle for temporarily holding the blank, located in  
55 proximity to the chucks and carrying grips having a transverse action to grip the blank upon its edges in said temporary holding-receptacle, and to carry the same to the receiving-  
60 chucks, substantially as and for the purpose set forth.

DILMAN BRUBACHER SHANTZ.

Witnesses:

B. BOYD,

H. T. S. GONEY.