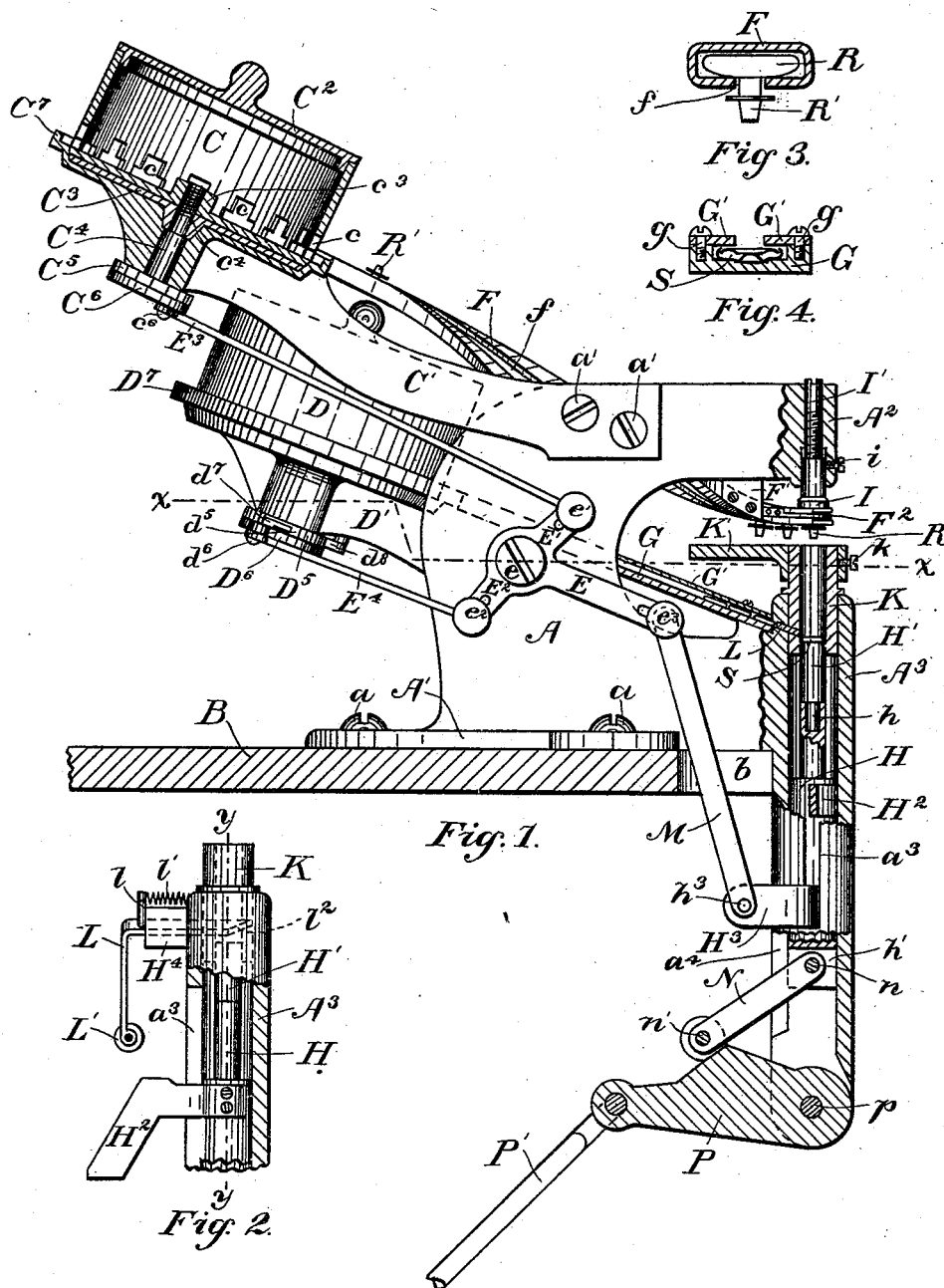


F. E. HALL.
BUTTON SETTING MACHINE.

No. 491,016.

Patented Jan. 31, 1893.



Witnesses
Albert E. Leach -
O. H. Gilman.

Inventor
Frank E. Hall
by M. B. M. Down
Att.

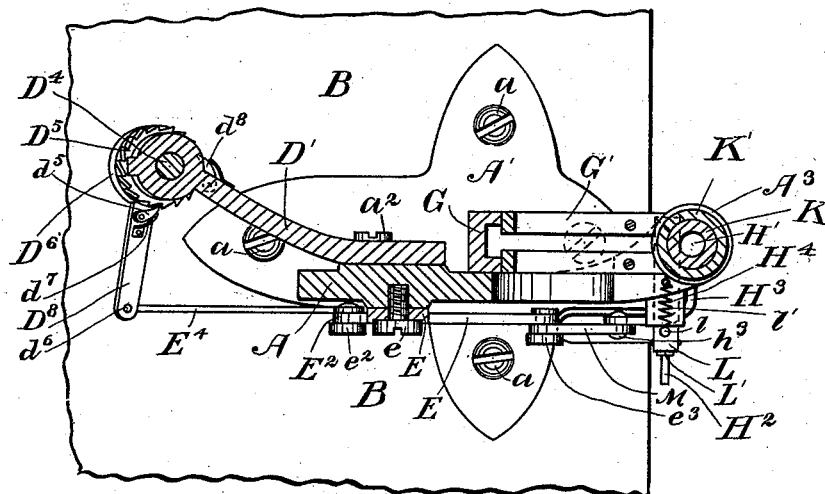
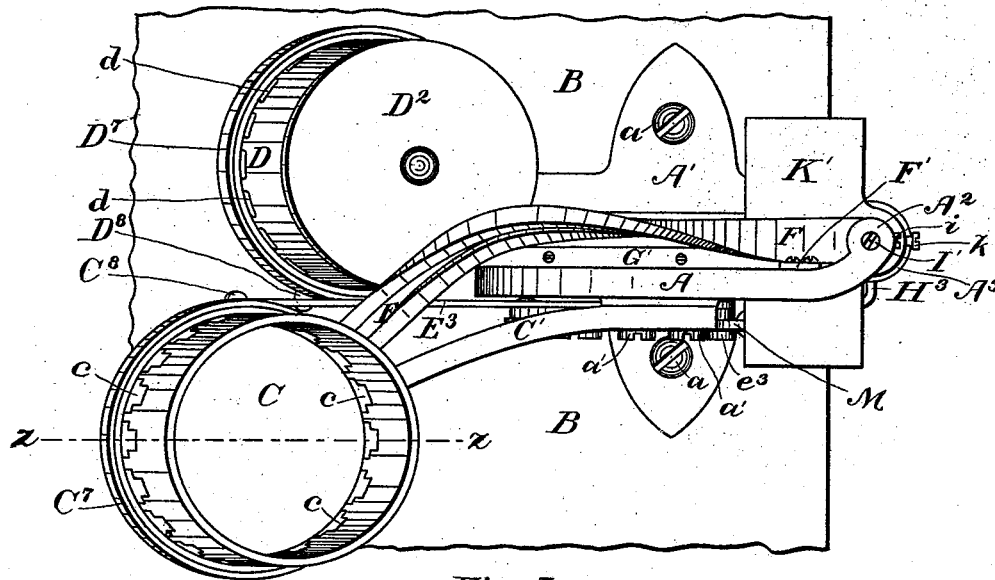
(No Model.)

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UNITED STATES PATENT OFFICE.

FRANK E. HALL, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO THE CONSOLIDATED FASTENER COMPANY, OF PORTLAND, MAINE.

BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 491,016, dated January 31, 1893.

Application filed February 23, 1892. Serial No. 422,336. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. HALL, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Button-Setting Machines, of which the following is a full specification.

My invention relates to machines for setting buttons of the class wherein the two main parts of the button are riveted together through the material, my improved machine being automatic in its action and adapted to feed both parts from separate hoppers to the point of clinching, in the manner hereinafter set forth in detail.

Referring to the accompanying drawings:—Figure 1—shows in side elevation, partly in section, a machine embodying my invention, the section through the upper hopper being taken in the plane of $z z$ Fig. 5. Fig. 2—is a front view of part of the plunger casing with a portion thereof shown in section. Figs. 3 and 4—are sectional views on an enlarged scale through the two chutes for feeding the button parts, the two parts being each shown in its respective chute. Fig. 5—is top plan view of the machine and Fig. 6 is a horizontal sectional view in the plane of $x x$ Fig. 1.

A is the standard of the machine and A' the base plate thereof screwed at a to the table B near the front edge of said table. The upper branch of the standard A terminates in front at A² in a shell or casing for the upper stationary die I, while the lower branch of the standard terminates in front in the plunger casing A³ which extends downward, below the table.

H is the plunger guided to move up and down in the opening within the casing A³. The plunger is bifurcated at its lower end as at h' and pivoted at n to the connecting arm N which is in turn pivoted at n' to the lever P fulcrumed at p to the bottom of the plunger casing.

P' is a rod connecting the lever P to a suitable treadle all parts being so arranged that an up and down motion is imparted to the plunger H when the rod P' is moved up and down, the arm N playing in the slot a^4 at the back of the plunger casing.

C and D are the two inclined hoppers which

are to contain a quantity of the button tops and washers respectively. The hoppers are mounted in the flanges C' D' which are integral with the brackets C' and D' respectively, said brackets being screwed or bolted to the standard one on each side thereof, and C² and D² are the hopper covers.

C⁴ is a shaft having bearings in the bracket C' near the outer end thereof. C³ is a plate set into the flange C' and fixed on the shaft C⁴ to turn therewith. The top of the shaft C⁴ is screw threaded as at c^4 to engage with the central tapped opening in the hub c^3 of the hopper C. The hopper is thus tightly screwed on the plate C³ with which it turns.

The various parts of the hopper D with its connections are precisely similar to the corresponding parts of the hopper C.

Fig. 6—best shows how motion is transmitted to the hopper D. D⁴ is the shaft (corresponding to the shaft C⁴ of hopper C) mounted in the bracket D'. D⁵ is a ratchet wheel fixed to the shaft D⁴ near the bottom thereof, while D⁶ is a disk or plate mounted loosely on the shaft D⁴ beneath the ratchet wheel, and provided with an arm D⁸. d^8 is a pawl on the arm D⁸ said pawl engaging with the ratchet wheel, being pressed against said ratchet by means of the spring d^7 . d^8 is a detent to prevent the backward turning of the shaft D⁴.

E, E', E² is a double bell-crank lever fulcrumed at e to the standard A. To the two arms, E' E² of this lever are respectively pivoted at e' e^2 the rods E³ E⁴ the rear ends of which rods are pivotally connected at c^6 d^6 respectively to the outer ends of the ratchet-actuating arms C⁸ D⁸. The outer end of the arm E is pivoted at e^3 to an end of the bar M which bar passes through the slot b in the table B and is pivotally connected at h^3 with the arm H³ rigidly secured to the plunger H. Thus as the plunger H rises and falls the arm H³ moves up and down in the side slot a^3 of the plunger casing, and through the bell-crank and ratchet-and-pawl mechanism just described, a step by step motion is given both hoppers C and D around their axes.

C is the hopper for the button tops represented by R R' Fig. 3. The hopper is provided around its sides at the bottom thereof

with the openings *c* of a size and shape to allow one button at a time when in proper position to pass out.

F is the raceway for the button tops the transverse section of which raceway is shown in Fig. 3. This raceway F is preferably made in one piece and is connected at its upper end with the flange C' near the lowest point of said flange in such a position that the open slot way *f* is uppermost but takes a twist in its course downward and terminates under the stationary die I with the slot way *f* beneath. The raceway F is held at the bottom by means of the piece F' screwed thereto and to the standard A. As the hopper C moves around, the button tops contained therein are stirred and agitated, being constantly dropped to the lowest point thereof in such position as to emerge through one of the openings *c* at frequent intervals, whence they pass into the raceway F with their riveting eyelets R' pointing upward, and drop by gravity to the lowest point thereof, said riveting eyelets R' at the bottom of the raceway pointing directly downward. A spring finger F² at the bottom of the raceway prevents the lowermost button top from passing out of the raceway, and keeps it under the die I.

It is intended to keep the raceway F constantly full of button tops from top to bottom, the lowermost button top having its head immediately under the stationary die I. This is held in its socket by means of the set screw *i*, and may be lowered when desired by the screw I' at the top.

G is the raceway for the button washers S, presenting in transverse section the shape shown in Fig. 4, having the top plates G' screwed thereon at *g*. This raceway passes directly down from the hopper D containing the washers, to the plunger casing A³ with the interior of which the raceway connects.

The hopper D has the openings *d* of such a shape that the washers can only emerge therefrom with the open side up. The washers, as shown in Fig. 4 contain anvils for clinching the riveting eyelets R' therein.

The plunger casing A³ is provided with a transverse slot way in line with the raceway G passing across the width of the plunger opening and communicating therewith, and passing through the side projection H⁴. In this slot way is guided the horizontally sliding gate L beveled at *l*² at its forward end and having a downwardly bent arm with a roller L' at the bottom thereof.

H² is a cam shaped arm secured to the plunger and projecting laterally through the slot A³ in such a position that when the plunger rises the cam shaped arm engages with the roller L' and moves the gate L outward thereby opening communication between the raceway G and the interior of the plunger casing. By means of the spring *l'* and the post *l* the gate L is moved backward into the position shown in Fig. 2, closing communication be-

tween the raceway and the pathway of the plunger, when the arm H² descends with the plunger.

H' is the lower die, the shank *h* of which is inserted in the top of the plunger H, and K is an inner sleeve inserted in the top of the plunger casing, the interior opening through which sleeve is of a size corresponding to that of the die H'. The slotway which contains the gate L lies partly in the sleeve K as shown in Fig. 1. The top of the die H' when the plunger is in the lowest position lies just below the gate L, so that a washer passing from the raceway G (with the gate L withdrawn to permit it) passes directly onto the top of said die.

The raceway G is preferably kept full of washers from top to bottom, the bottom washer resting normally against the smooth inner edge of the gate L.

K' is a table which by means of the screw *k* is held on the top of the sleeve K on a level with the top surface thereof. This table supports the material on which the buttons are to be mounted.

The plunger H and the movable die H' attached thereto have their central axis in line with that of the stationary die I.

Starting with the raceways both full, with a washer on top of the movable die H', and with the material on which the buttons are to be mounted resting in proper position on the table K', the operation of the machine is as follows:—The rod P' is pushed upward (as by a down stroke of the foot on the treadle) thus moving the plunger and with it the die H' upward in the casing A³, carrying the washer S up against the under surface of the material as it rests on the table K' and then, continuing upward, lifts the material with it, and pushes it against the downwardly projecting eyelet R' of the button under the die I, with the result that a hole is automatically sheared through the material, and the eyelet R' comes in contact with the anvil within the washer S. Finally, at the end of the up stroke of the plunger, the eyelet R' is rounded out within the washer S and the button thus firmly clinched on the material, between the two dies H' and I. When the rod P' is drawn down, the plunger descends. During the upstroke of the plunger H, the gate L is withdrawn allowing the lowermost washer in the raceway G to fall into the opening left by the gate, said washer resting against the plunger. When the plunger descends and the cam arm H² passes out of contact with the roller L', the beveled portion *l*² of the gate L is pressed by the spring *l'* against the washer S which has dropped in the path of the gate, so that when the top of the die H' has passed beneath the opening occupied by the washer, the said gate springs back in place and moves the said lower washer into the plunger casing upon the top of the die H' in to the position shown in Fig. 1. Meantime, the operator by pulling

the material has removed the button last set from under the die I past the holding spring F² and another button top or head drops into place against said spring.

5 It is my purpose to have the machine perfectly adjustable for different sized button heads and washers. The hoppers C and D may be readily removed and replaced by others containing different sizes of button parts, the openings *c* and *d* being of course of proper
10 size to feed the particular part into the raceway.

The dies H' and I may be readily removed and replaced by others of sizes corresponding
15 to the button parts, and the sleeve K is also removable, it being of course necessary to have the sleeve in each case correspond in size of central opening with the size of the die H'.

20 It will be noticed that by the peculiar construction and arrangement of the parts, the washers are fed one by one from the raceway onto the movable die at its lowermost position, the washer on the top of the die being
25 then moved upward, through the passage way which it approximately fits, almost to the point of clinching, thus securing great accuracy in bringing the two parts of the button together.

30 I claim,—

1. In a button setting machine the combination of a stationary die, means for holding a button head with its rivet centrally beneath said die, a guiding passageway, a movable die,
35 fitting said passageway and having a vertical reciprocating motion therein, and a washer-guiding raceway communicating with said passageway just above the top of said movable die, when at its lowest position, and adapted
40 to deliver a washer on the top of said movable die, substantially as described.

2. In a button setting machine the combination of a stationary die, means for holding a button head with its rivet centrally beneath
45 said die, a guiding passageway, a movable die fitting said passageway and having a vertical reciprocating motion therein, an inclined washer-guiding raceway having communication with said passageway just above the top
50 of said movable die, when at its lowest position, and a reciprocating gate moving between said raceway and passageway, whereby one washer at a time is delivered on said movable die, substantially as described.

3. In a button setting machine the combination of a stationary die and raceway F a
55 guiding passageway, a movable die fitting said passageway and having a vertical reciprocating motion therein, an inclined washer-guiding raceway having communication with
60 said passageway just above the top of said movable die, when at its lowest position, and a reciprocating gate F moving between said raceway and passageway, whereby one washer at a time is delivered on said movable die,
65 substantially as described.

4. In a button setting machine the combination of a stationary die and raceway F a
70 guiding passageway, a plunger, a movable die mounted on said plunger fitting said passageway and having a vertical reciprocating motion therein, an inclined washer-guiding raceway having communication with said passageway just above the top of said movable die, when at its lowest position, and a reciprocating
75 gate F horizontally movable across the path of said raceway between it and the passageway, said gate being beveled at its forward end, substantially as and for the purposes described.
80

5. In a button setting machine the combination of a stationary die and raceway F the plunger H, sleeve K, die H', inclined raceway G, spring actuated gate L, having the beveled
85 portion *l*² and provided with the roller L', and the cam-arm H² secured to said plunger and engaging with said roller, substantially as and for the purposes described.

6. In a button setting machine the combination of a stationary die, a vertically reciprocating die, a plunger operating the movable
90 die, hoppers for the button heads and rivets actuated by said plunger, a twisted raceway leading from the button-head hopper to the stationary die, an inclined raceway passing
95 from the washer hopper to said movable die, and a plunger-operated washer-separating gate interposed between said raceway and said movable die, whereby at each stroke of the plunger a washer is moved from the raceway and deposited on the movable die at its
100 lowest position, substantially as described.

In witness whereof I have hereunto set my hand.

FRANK E. HALL.

Witnesses:

LOUIS A. DONILLE,
WM. B. H. DOWSE.