

(No Model.)

3 Sheets—Sheet 1.

E. WOODWARD.
BUTTON SETTING MACHINE.

No. 477,347.

Patented June 21, 1892.

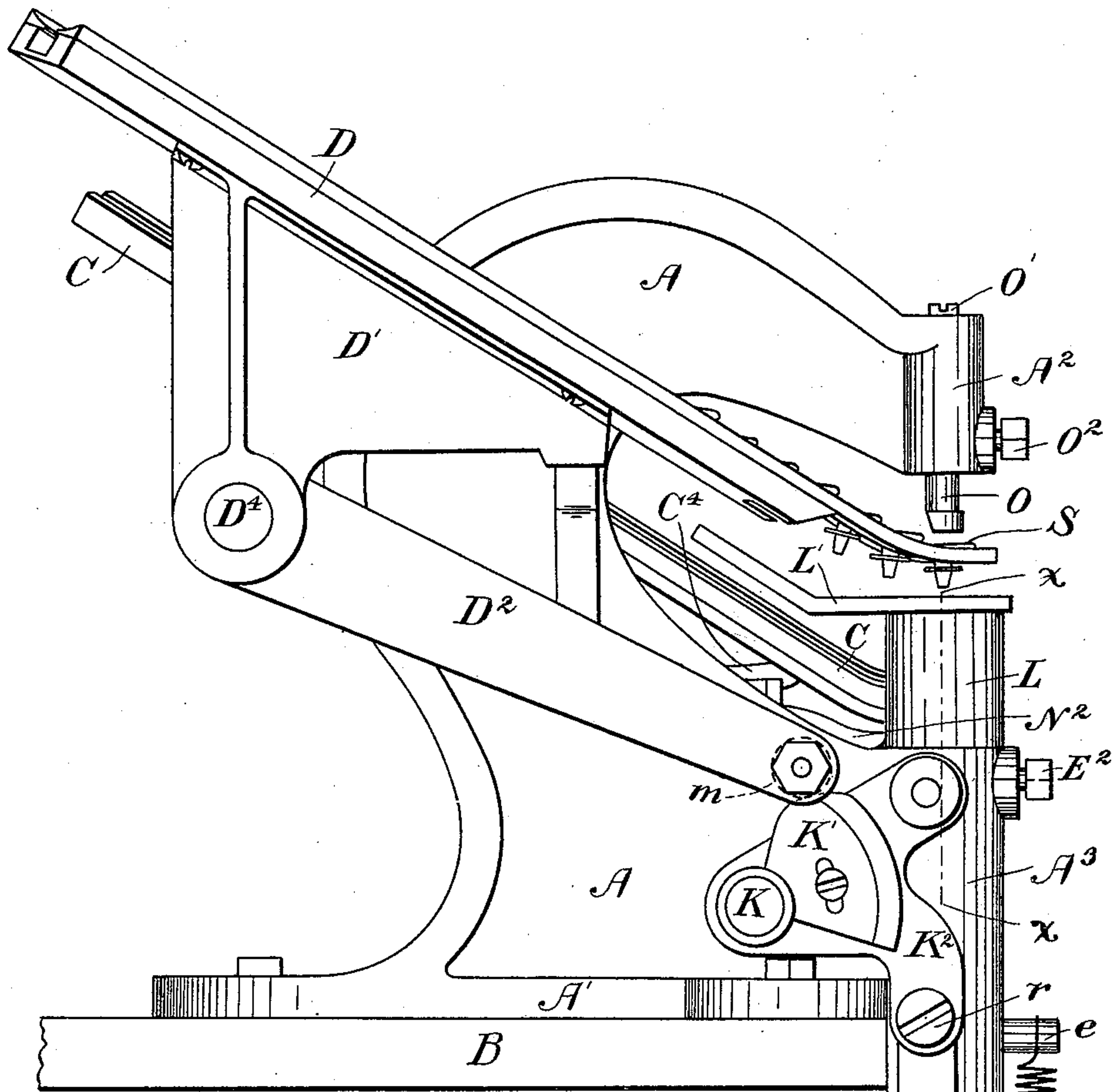
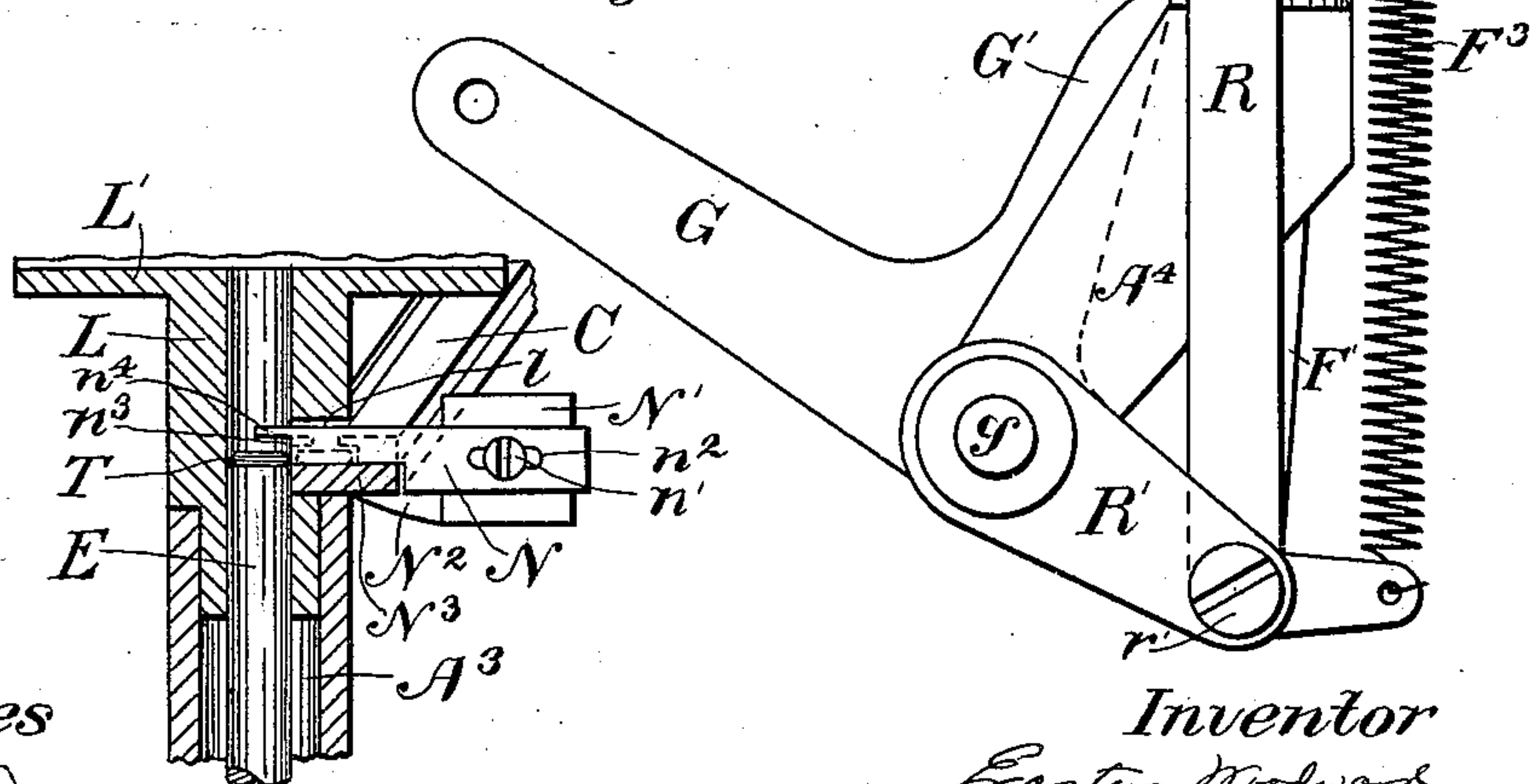


Fig. 1.



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Fig. 2.

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By N. B. H. DOWSE,
att'y

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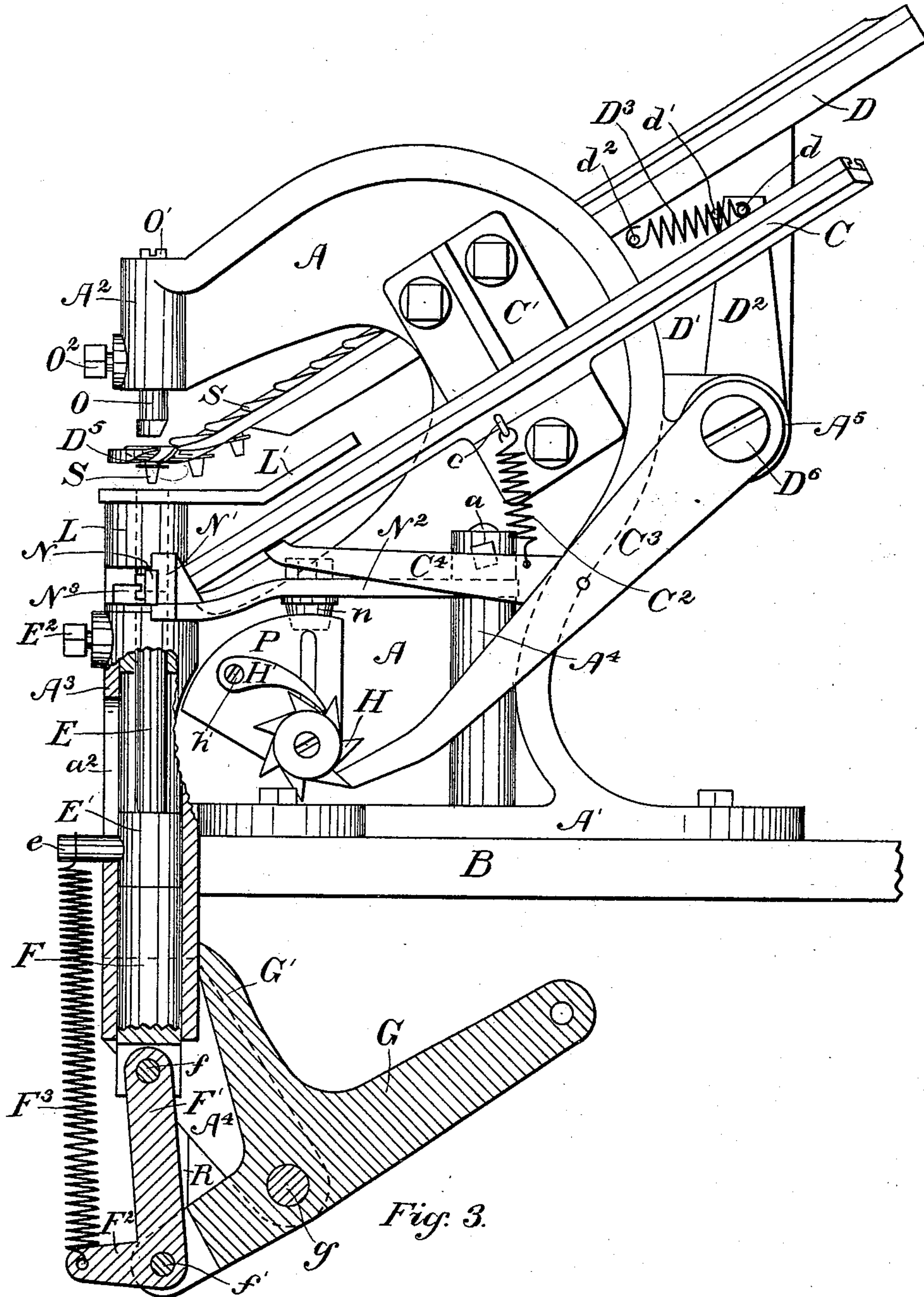


Fig. 3.

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3 Sheets—Sheet 3.

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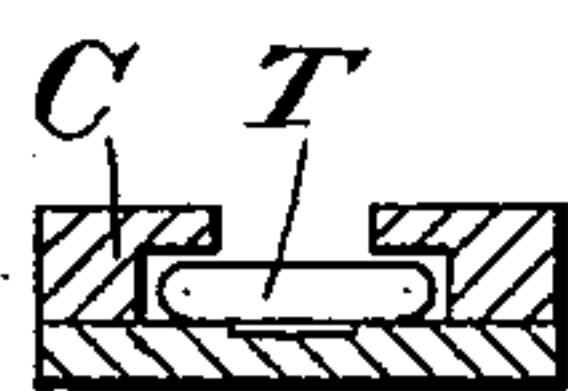
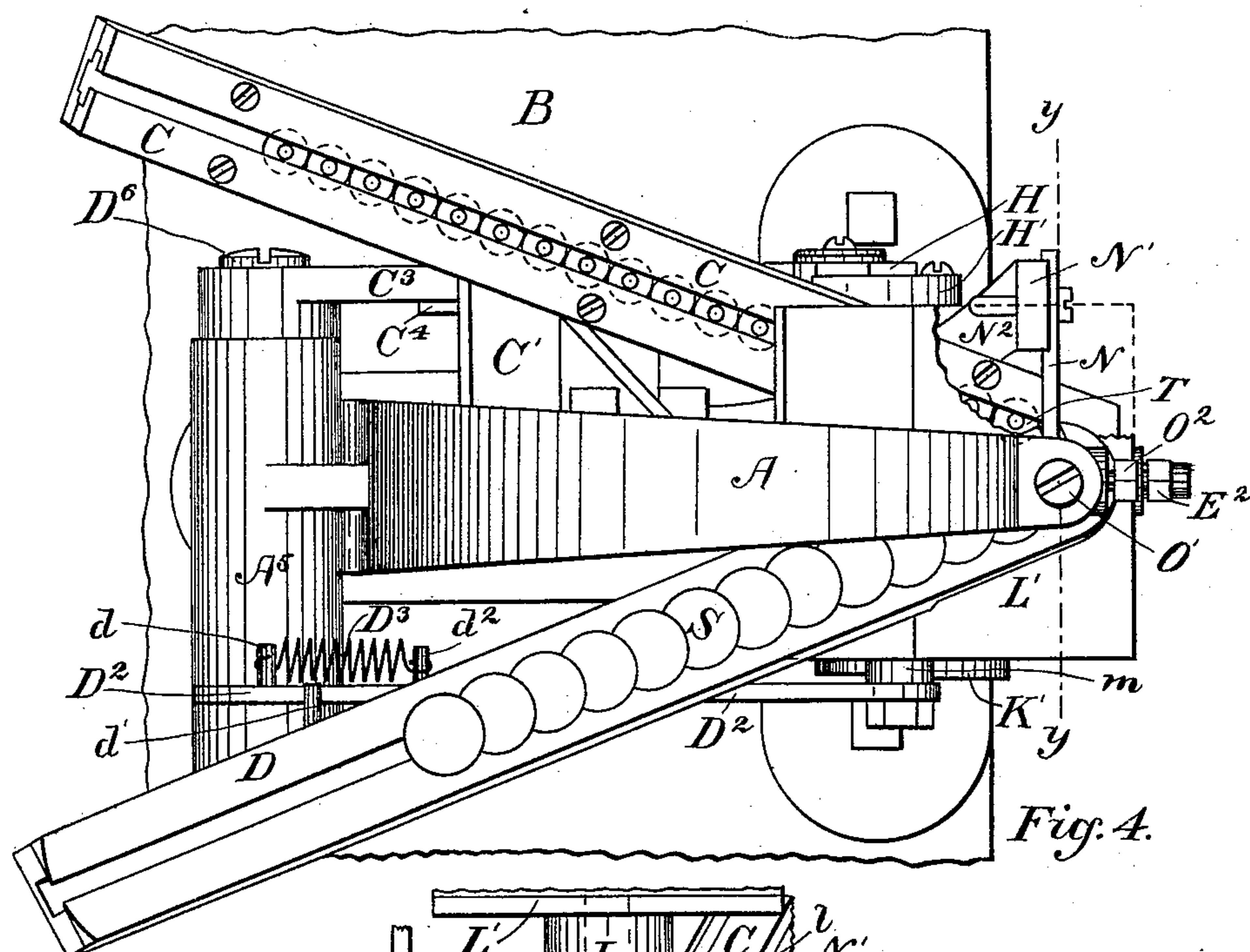


Fig. 7.

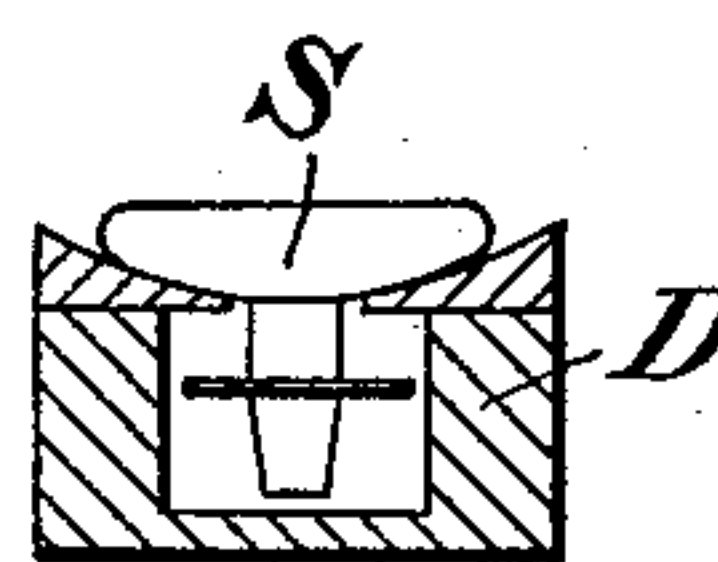
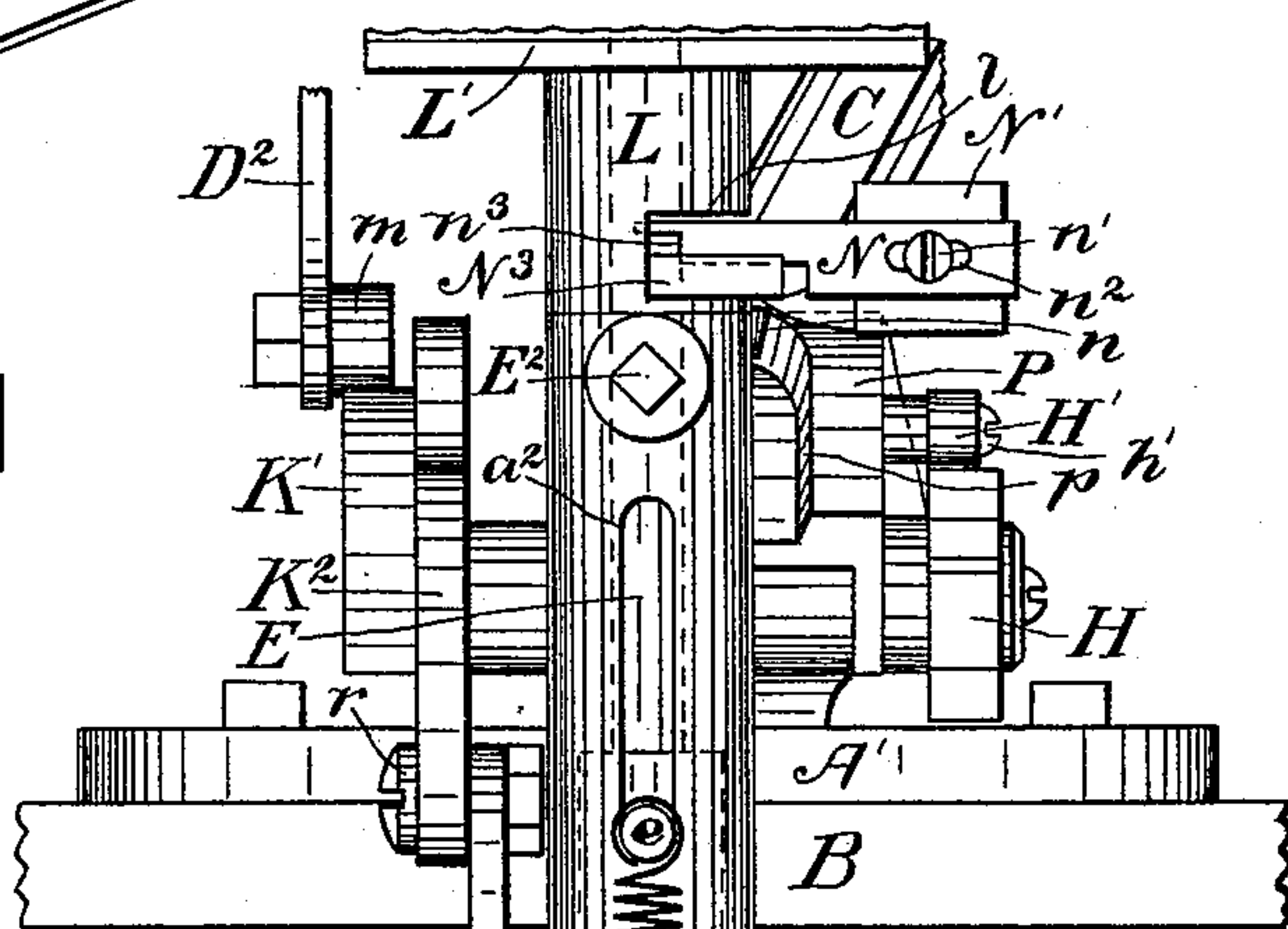
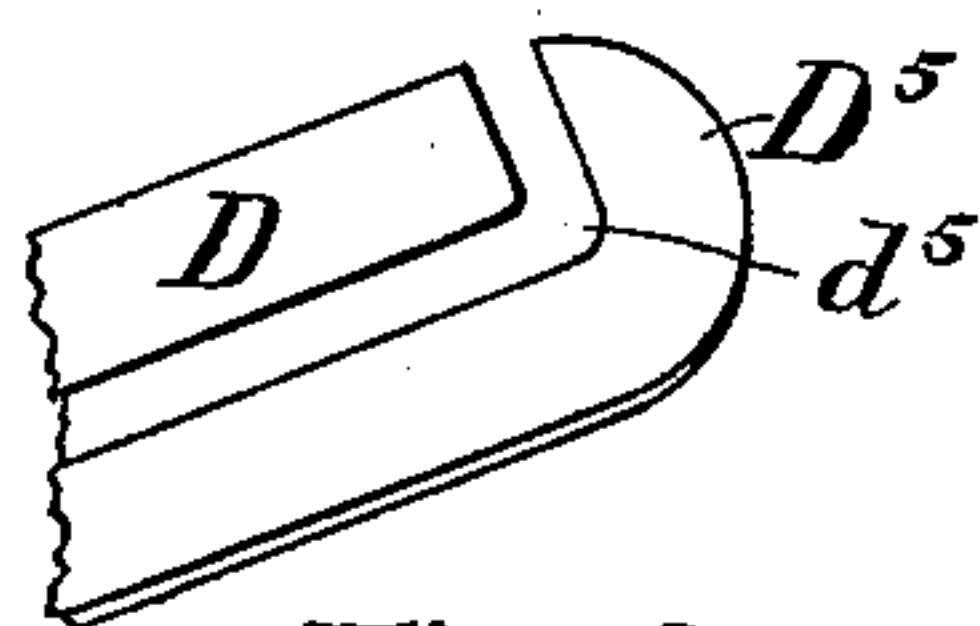


Fig. 6.



Figs. 8.

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Fig. 5.

Inventor

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UNITED STATES PATENT OFFICE.

ERASTUS WOODWARD, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO THE
CONSOLIDATED FASTENER COMPANY, OF PORTLAND, MAINE.

BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 477,347, dated June 21, 1892.

Application filed February 29, 1892. Serial No. 423,114. (No model.)

To all whom it may concern:

Be it known that I, ERASTUS WOODWARD, of Somerville, 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 consists of certain improved features of construction in machines for automatically setting two-part buttons on clothing and other material, the two parts of the button consisting, first, of a button-top with its riveting eyelet, which eyelet is to be pressed through the material, and, second, of a washer within which the eyelet of the button-top is clinched by pressure.

My invention consists especially in the improved manner of feeding the button parts and of bringing them together in pairs at the point of clinching.

In the accompanying drawings, Figure 1 shows my improved machine in side elevation. Fig. 2 is a sectional detail view in the plane of $\alpha\alpha$, Fig. 1. Fig. 3 shows in elevation the opposite side of the machine to that shown in Fig. 1, part of the front thereof being shown in section. Fig. 4 is a top plan view of the machine. Fig. 5 is a front elevation of the lower portion of the machine, or that part which has to do with the separation and upward motion of the button-washers. Fig. 6 is a transverse section through the button-top raceway, showing a button-top therein. Fig. 7 is a similar section through the washer-raceway with a washer therein, and Fig. 8 shows in plan the end of the button-top raceway.

A is the standard, and A' the base-plate of my improved machine, which is bolted to the table B.

A³ is the plunger-casing at the front of the lower portion of the standard A, while A² is the socket for the upper die at the top of the standard.

F is the plunger, which moves up and down in the plunger-casing, being pivotally connected at f with the piece F', which is in turn pivoted at f' to the end of the lever G G'. This lever G G' is fixed on the shaft g , which has its bearings between the side pieces A⁴ A⁴ at the bottom of the plunger-casing, thus

forming a fulcrum to the lever. The outer rear end of the lever G G' is connected with a suitable treadle or other actuating device adapted to give an up-and-down motion to said lever, from which all the moving parts of the machine derive their motion.

E is the lower die, the base E' of which rests on the plunger F, being provided with the pin e , which, as the plunger moves up and down, travels in the slot a^2 . The piece F' has the forwardly-projecting portion F², between which and the pin e is fixed the spring F³, which draws down the lower die on the down-stroke of the plunger.

L is the sleeve, which is set into the top of the plunger-casing A³ and is held therein by the screw E². The sleeve L is surmounted by the table L', preferably integral therewith, on which table the material rests which is to receive the buttons. The interior opening which passes through the sleeve and table forms a passage-way of corresponding diameter to that of the die E, within which passage-way the said die moves up and down.

C is the inclined raceway for the button-washers T, being, in the transverse section shown in Fig. 7, of a size to hold said washers loosely therein. This raceway is stationary, being held by the bracket C', which is screwed or bolted to the side of the standard A. The inclination of the raceway is such as to cause any washers held therein to readily move downward to the lowest point thereof when no resistance is opposed. The raceway C communicates indirectly with the passage-way through the sleeve L, the level of the raceway-outlet being just above the top of the die E when in its lowest position, said outlet being to one side of said die and not in direct line therewith, as shown in Fig. 2. The arrangement is such that the lowest washer in the raceway C rests on a plate N³ within an opening l in the side wall of the sleeve L adjacent to the die passage-way.

On the shaft g is fixed to turn therewith the arm R', at the outer end of which at r' is pivoted an end of the bar R, the upper end of which bar is pivoted at r to the plate K², which is fixed on the shaft K. The shaft K passes through the standard A, having bearings therein, and on the opposite side of the

standard from the plate K^2 is the cam P, Figs. 3 and 5, fixed on the shaft K to turn therewith, so that as the lever G moves the shaft g the cam P has an angular motion on the shaft K as a center.

N^2 is an arm pivoted on the vertical spindle a , arising from the hub A^4 , which hub is integral with the standard. At the outer or forward end of the arm N^2 is the block N' , on the front face of which is fixed the separator-plate N, which projects into the opening l in the sleeve L, as shown in Figs. 2 and 5.

n is a cam-roll on the arm N^2 , which engages with the groove p in the cam P, with the result that as the cam P moves back and forth angularly the separator-plate N is given a reciprocating motion in the direction of its length, being moved back and forth in the opening l across the outlet of the raceway C, alternately opening and closing said outlet in the manner and for the purpose presently to be detailed.

O is the stationary die held in the socket A^2 in central axial line with the movable die E. O^2 is the set-screw which holds the die at any desired height, fixed by the screw O' .

D is the inclined button-top raceway secured to the bracket D' , which bracket is mounted on the shaft D^4 in the sleeve A^5 , the sleeve being integral with the standard A.

D^2 is a bell-crank lever loosely mounted on the shaft D^4 , the upright arm of which lever D^2 is provided with the pin d .

d^2 is a pin fixed in the bracket D' , while a spiral spring D^3 connects the pins d and d^2 , tending to draw them together.

d' is a stop fixed in the face of the bracket D' , against which the upright arm D^2 , Fig. 3, normally bears. The lower or forwardly-projecting arm of the bell-crank D^2 as shown in Fig. 1, is provided at its forward end with a cam-roll m , which engages with the cam K' , fixed on the shaft K and fixed also on the face of the plate K^2 , so that the cam turns with said shaft. The cam is so shaped as to give a vibratory motion to the bell-crank D^2 , the upper vertical arm of which, through the spring connection D^3 , causes the raceway D to vibrate about its central shaft D, alternately bringing the lower end D^5 of the raceway up against the bottom of the die O and moving it down therefrom into the position shown in Figs. 1 and 3 when the machine is at rest.

The transverse section of the raceway D is shown in Fig. 6, the button-tops lying nearly vertical in said raceway, the upper plate of which is concave, as shown. The construction and arrangement of the inclined raceway are such that the button-tops are adapted when slid into the raceway at the upper end thereof to assume the position indicated in Figs. 1 and 3, the head of each button-top overriding that of the one next below. The passage of the shanks of the button-tops between the upper plates of the raceway D is turned at right angles at the bottom of the

raceway, as plainly indicated in Fig. 8, thereby forming a shoulder d^3 , against which the lowermost button-top rests, with its riveting eyelet pointing directly downward and its head in the hollow pocket, as shown in Fig. 3, directly under the stationary die O.

C^3 is an arm pivoted at its upper end at D^6 on the sleeve or hub A^5 .

H is a ratchet-wheel loosely mounted on the shaft K, which shaft has fixed thereon, as above described, the cam P.

H' is a pawl pivoted at h' to the outer face of the cam P and engaging with said ratchet-wheel.

C^4 is a hammer rigidly secured to the arm C^3 , while C^2 is a stiff spring, one end of which is seated in the hammer C^4 , while the other is secured in the eye c on a connection of the raceway C. The spring C^2 keeps the lower end of the arm C^3 in engagement with the ratchet-wheel H, so that as the cam P in its angular vibration back and forth moves the pawl H' the latter gives motion to the ratchet-wheel H in one direction, causing the arm C^3 and the hammer C^4 to vibrate, so that each time the arm C^3 slips over a ratchet-tooth the hammer C^4 , under the influence of the spring C^2 , sharply raps against the bottom of the raceway C, the succession of raps or jarring motion thus produced causing the washers contained in the raceway to be fed into place at the outlet thereof more positively than would otherwise be the case.

The operation of my machine is as follows: Starting with the parts in the position of the machine at rest, with the plunger down, a washer on top of the die E, the raceways C and D containing a column of washers and button-tops, respectively, and the movable raceway D, with a button-top in the hollow pocket at the end thereof, being at its lowermost position, with a space between the head of said button-top and the bottom of the die O. The material on which the button is to be set is placed in proper position on the table L' , and by a down-pull on the outer end of the lever G the plunger F starts on its upstroke. The separator-plate N first makes its lateral movement in the opening l , bringing the projecting finger n^4 out of line with the die E, which die passes upward, carrying the washer T under the material on the plate L' , and then lifting both washer and material up against the downwardly-projecting clinching-eyelet of the lowermost button-top S, resting in the pocket at the end of the raceway D. At the same time the movable raceway D rises before the die E and holds the head of the button firmly against the bottom of the die O. At the end of the upstroke of the plunger the clinching-eyelet is pressed through the material and clinched firmly in the washer at the bottom thereof. Meantime the separator-plate N in its side movement uncovers the outlet to the raceway C, allowing the lowest washer therein to move into the opening l at one side of the path of the die E, and in the

path of said separator-plate. The finger n^4 , when the separator-plate is drawn out, projects across the top of the outlet to the raceway C and prevents more than one washer from passing out therefrom. Near the end of the downstroke of the plunger the separator-plate moves inward, returning to the position shown in Fig. 2, and pushing the new washer in front of the face n^5 onto the top of the die E. After the button has been set on the material the raceway D moves downward, carrying the button just fixed out of contact with the die O, and the said button is removed from the pocket at the end of the raceway by a side pull of the material, allowing the next button to fall into the pocket, and the parts of the machine are in position for a repetition of the operation when it is desired to set another button.

In the machine herein show the raceways are to be filled by hand, though automatically-feeding hoppers may be employed, if desired, to do this work. With regard to the motion of the movable raceway D, the parts are preferably so constructed and arranged that when, through the spring connection D^3 , the bell-crank D^2 has moved the raceway upward till the button-head at the bottom thereof comes in contact with the bottom of the die O the said bell-crank has not reached the end of its stroke, but moves a slight distance farther on, thus distending the spiral spring D^3 and causing the button-head to be pressed firmly upward against the die O by spring-pressure. By this means, even when the button-heads vary in size and shape to some extent, they are in every case held firmly against the clinching-die, irrespective of their thickness.

The separator-plate N is secured to the face of the block N' by means of the screw n' , and by having said plate provided with the slot n^2 the position of the plate may be adjusted.

I claim—

1. In a button-setting machine, the combination of a stationary die, an inclined button-top raceway provided with a pivoted bracket, a vibratory actuating-arm having a spring connection with said bracket, and a suitably-guided movable washer-bearing die working

in line with said stationary die, substantially as described.

2. In a button-setting machine, the combination of a stationary die O, an inclined vibratory button-top raceway D, having its lower end movable alternately to and from said stationary die, said raceway having a shank-conducting passage-way bent at substantially right angles at d^5 at the bottom thereof, whereby the lowermost button-top is held in the raceway beneath the die, and a suitably-guided movable washer-bearing die, substantially as described.

3. In a button-setting machine, the combination of a stationary die, means for holding a button-head with its clinching-eyelet beneath said die, a sleeve L, having an interior guiding passage-way and an opening l on one side of the passage-way, a washer-conducting raceway C, terminating in the opening l , a washer-receiving plate N^3 at the bottom of said opening, a movable die E, working in said passage-way, the top of said die being on a level with the outlet of the raceway when said die is at its lowest position, and a laterally-movable reciprocating separator-plate N alternately covering and uncovering the outlet of said raceway, whereby a washer on leaving the raceway passes first into the opening l to one side of the guiding passage-way and is then fed onto said die, substantially as and for the purposes described.

4. In a button-setting machine, a washer-separating device consisting of the combination of the button-raceway D, a raceway C, a movable die E, a sleeve L, having an inner guiding passage-way within which said die works and provided with the opening l , in which said raceway terminates on one side of said passage-way, and the laterally-movable reciprocating separator-plate N, provided with the finger n^4 , engaging with the outlet of the raceway, substantially as and for the purposes described.

In witness whereof I have hereunto set my hand.

ERASTUS WOODWARD.

Witnesses:

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ALBERT E. LEACH.