

(No Model.)

3 Sheets—Sheet 1.

H. M. ESSINGTON.

BUTTON HOLE BARRING MACHINE.

No. 377,931.

Patented Feb. 14, 1888.

Fig. 1.

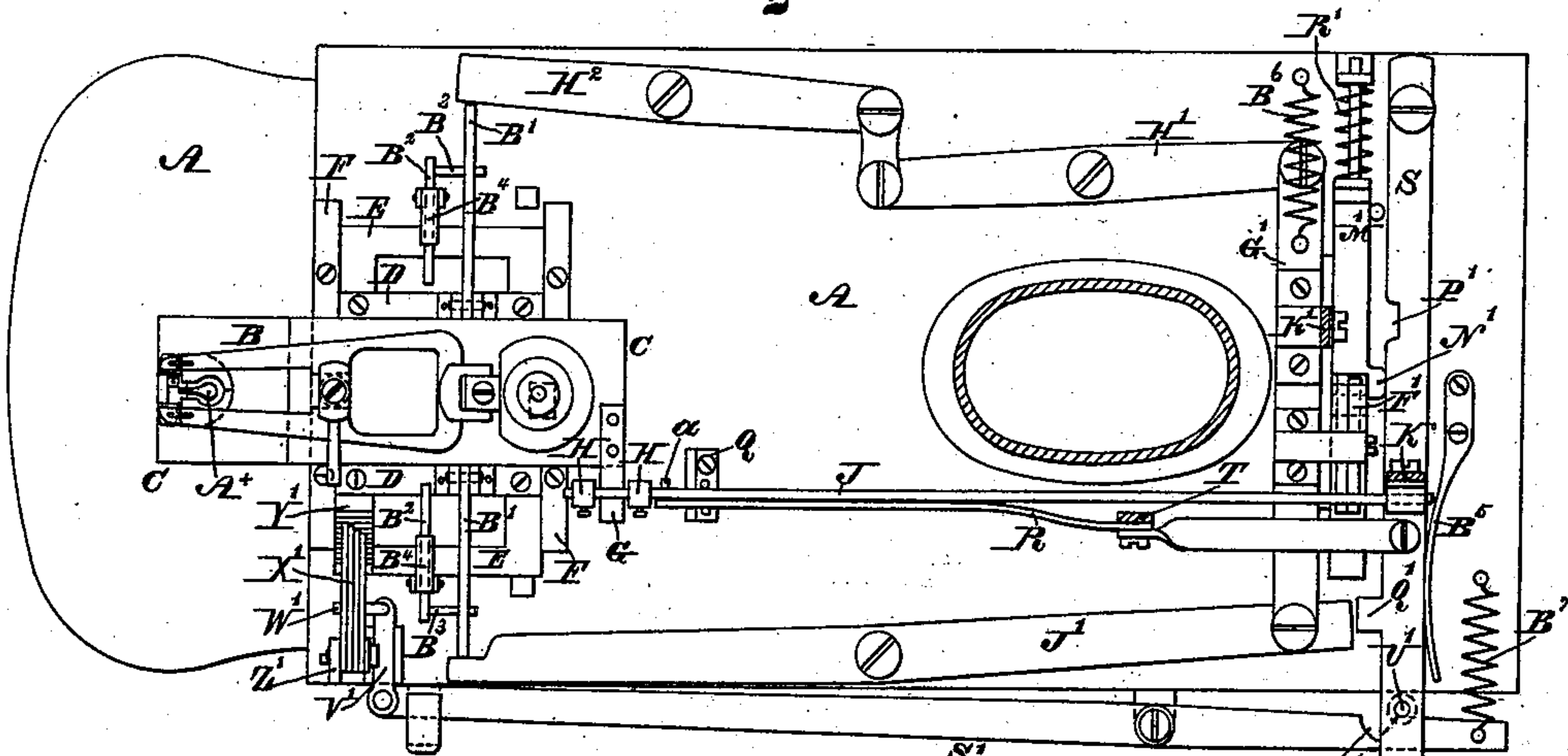


Fig. 4.

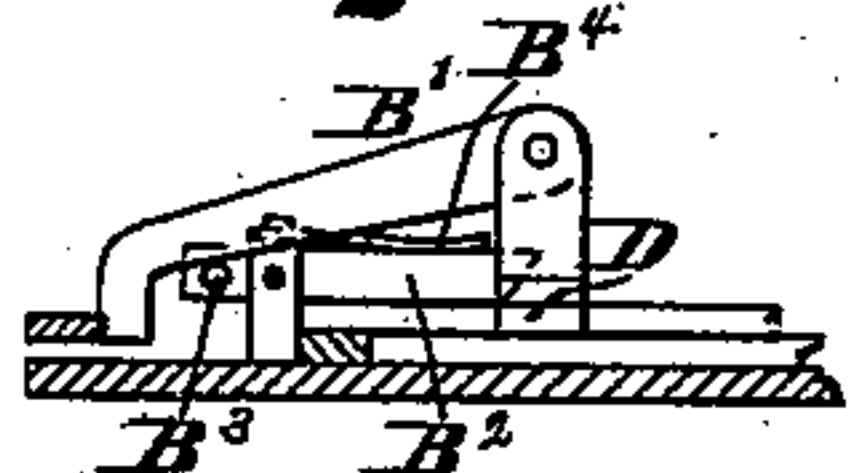


Fig. 5.

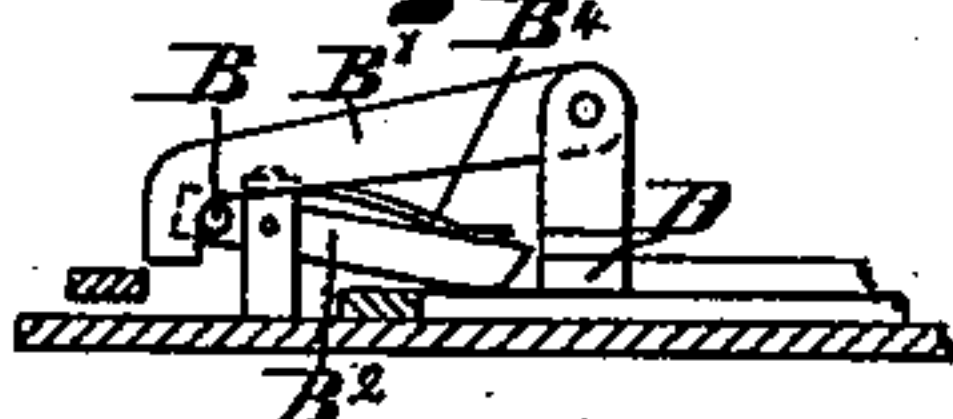


Fig. 2.

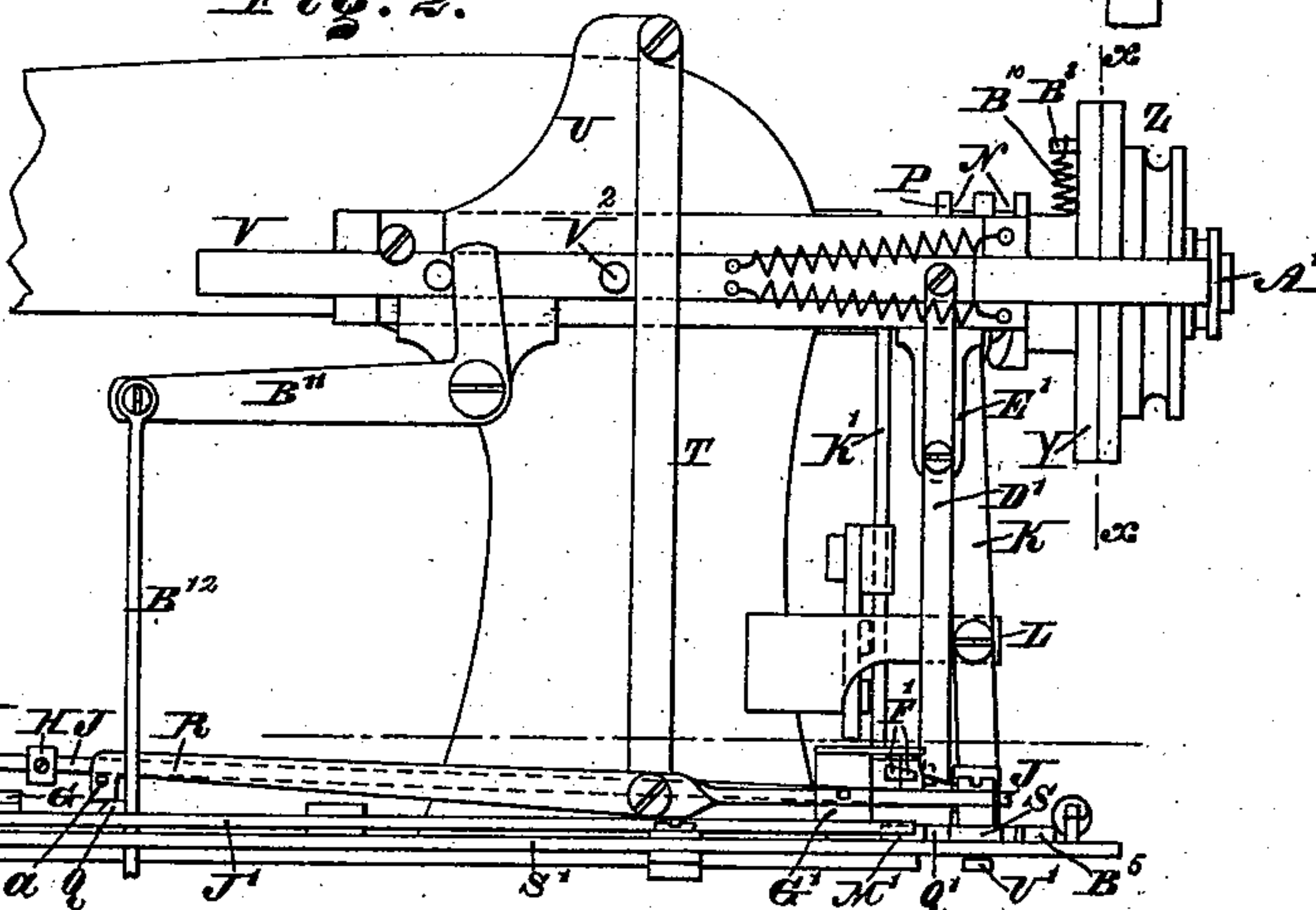
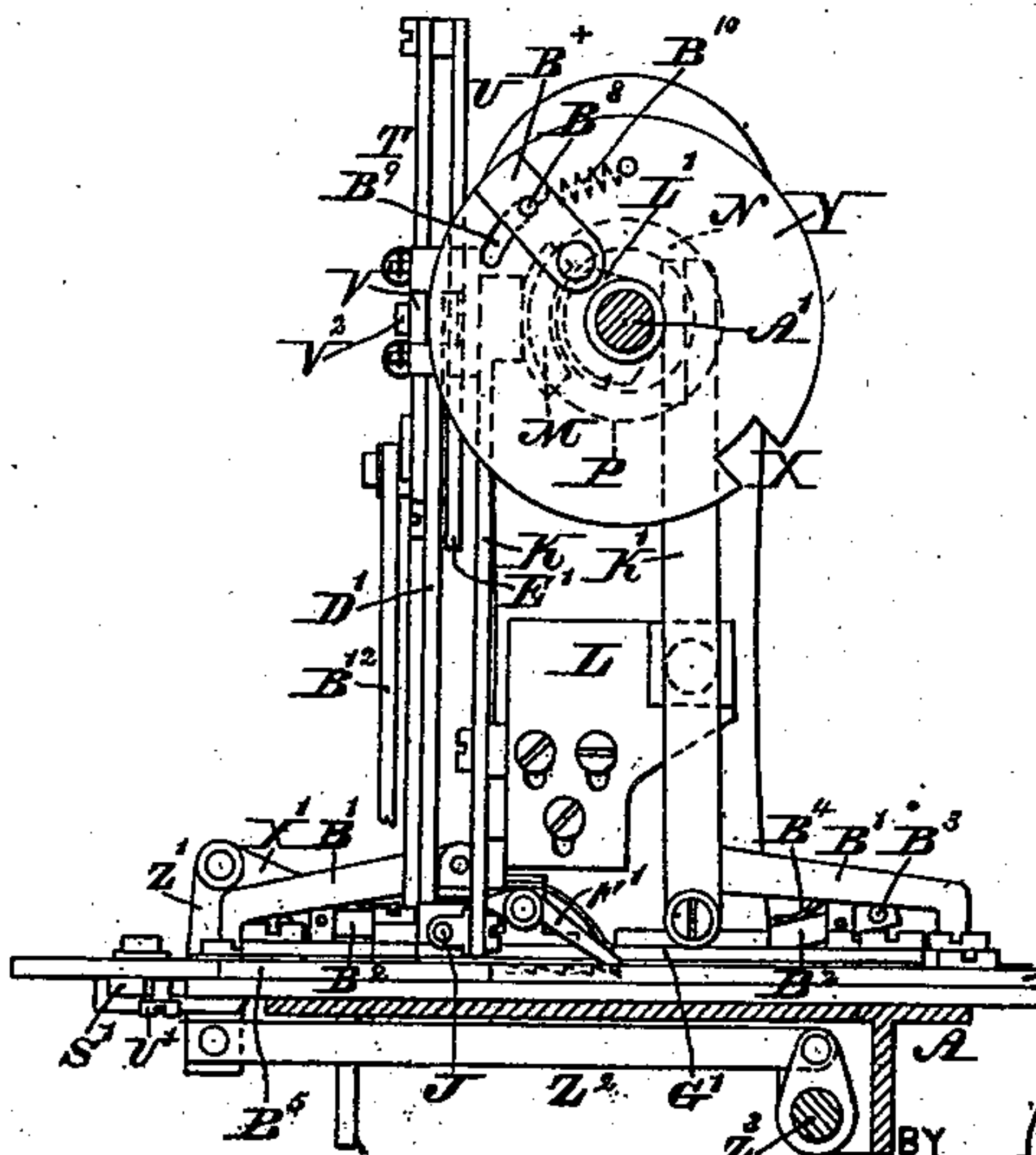


Fig. 3.



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Fig. 6.

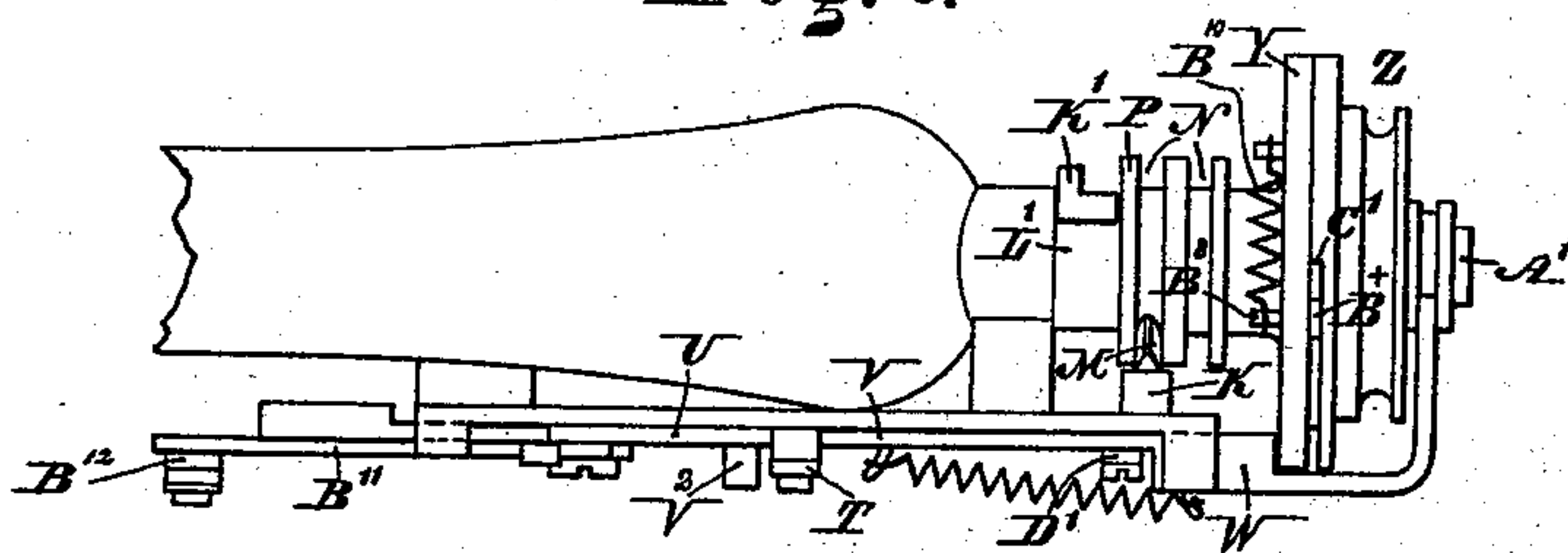


Fig. 7.

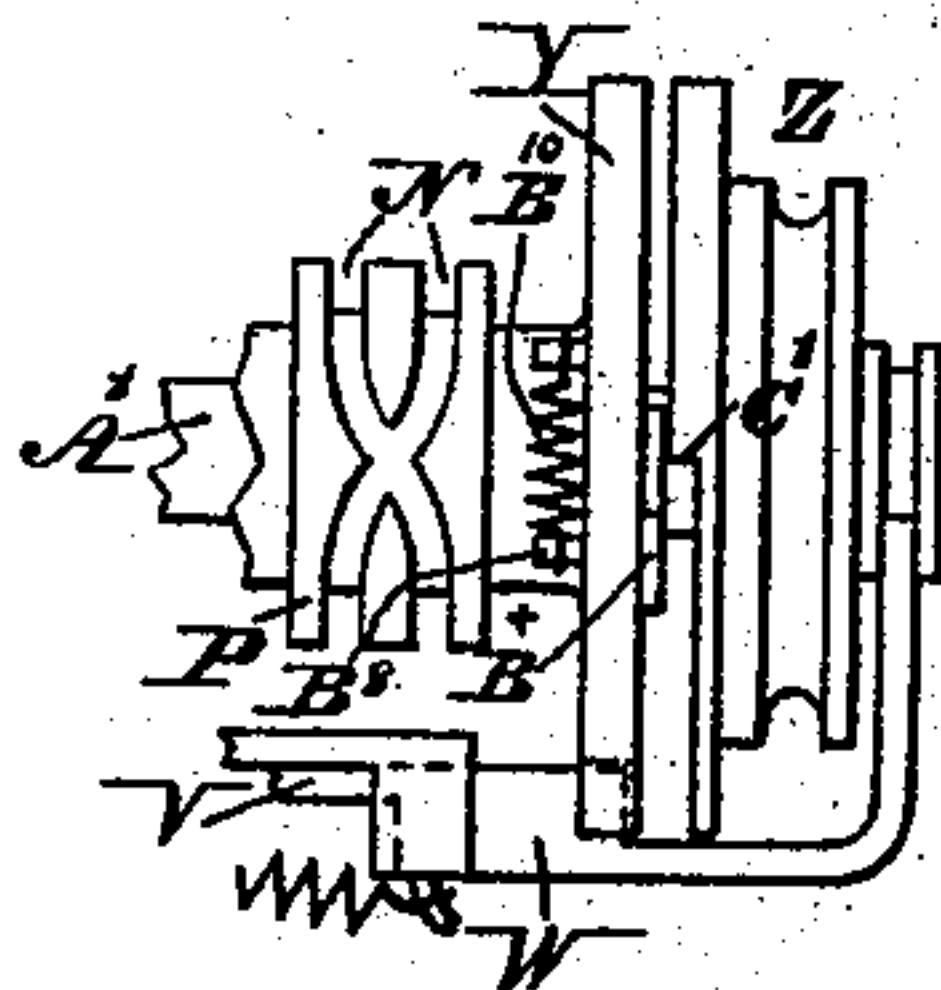


Fig. 8.

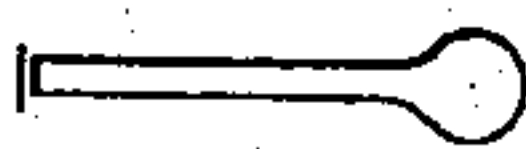
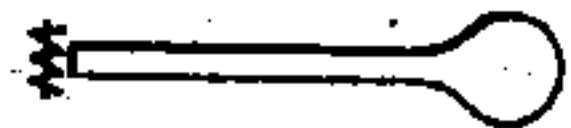


Fig. 9.



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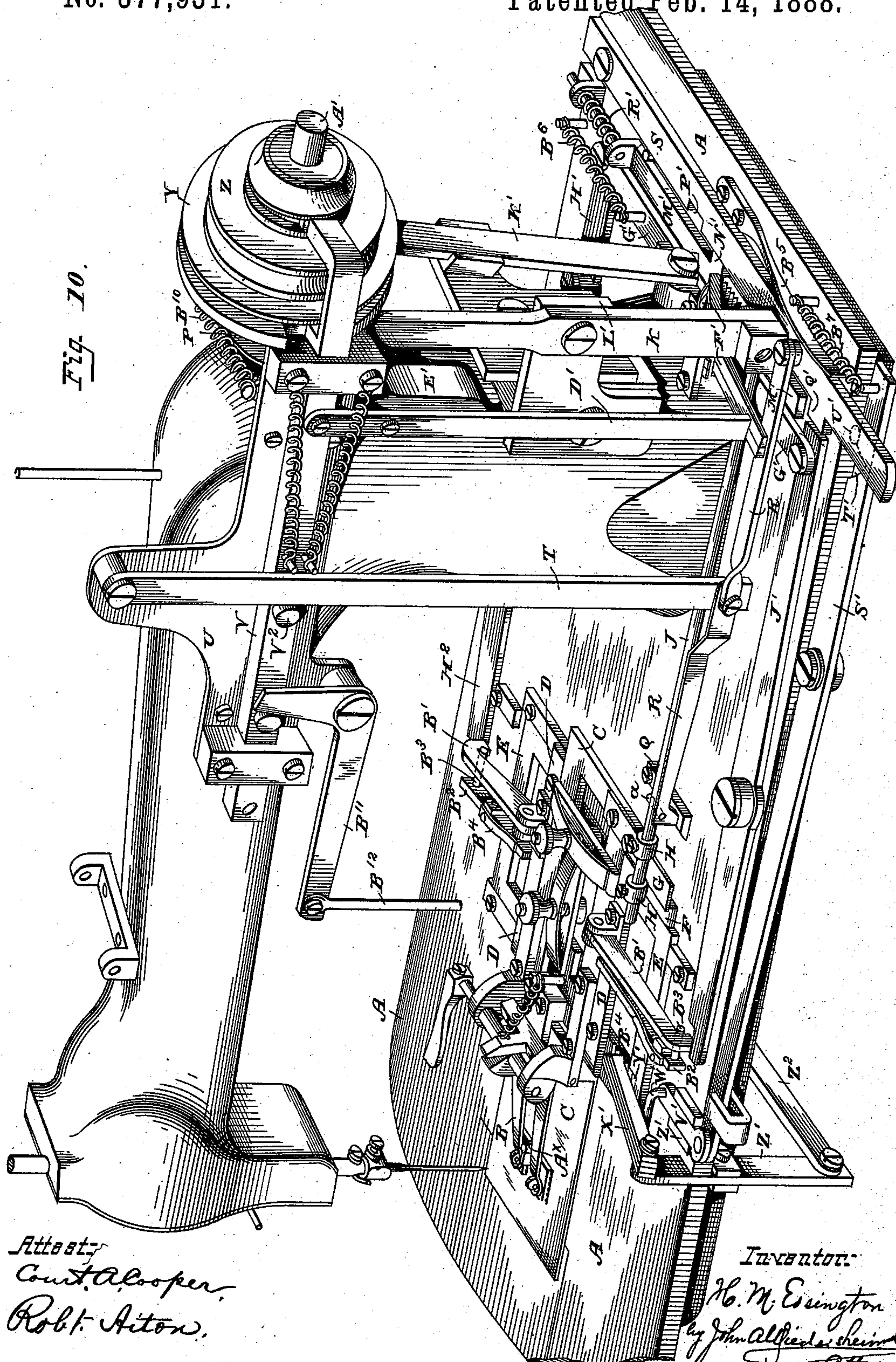
3 Sheets—Sheet 3.

H. M. ESSINGTON.

BUTTON HOLE BARRING MACHINE.

No. 377,931.

Patented Feb. 14, 1888.



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UNITED STATES PATENT OFFICE.

HARRY M. ESSINGTON, OF CAMDEN, NEW JERSEY, ASSIGNOR TO THE ESSINGTON BUTTON-HOLE FINISHING MACHINE COMPANY.

BUTTON-HOLE-BARRING MACHINE.

SPECIFICATION forming part of Letters Patent No. 377,931, dated February 14, 1888.

Application filed June 24, 1886. Serial No. 206,109. (No model.)

To all whom it may concern:

Be it known that I, HARRY M. ESSINGTON, a citizen of the United States, residing in the city and county of Camden, State of New Jersey, have invented a new and useful Improvement in Machines for Finishing Button-Holes, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 represents a partial top or plan view and partial horizontal section of a machine for finishing button-holes embodying my invention. Fig. 2 represents a side elevation of a portion thereof. Fig. 3 represents an end view thereof, partly sectional in line *xx*, Fig. 2. Figs. 4 and 5 represent vertical sections of a detached portion on an enlarged scale. Fig. 6 represents a top view of a detached portion. Fig. 7 represents a view of a portion of Fig. 6, the parts being in different positions. Figs. 8 and 9 are views of the line of stitches as made by the device described herein. Fig. 10, Sheet 2, represents a perspective view of a button-hole-finishing machine embodying my invention as seen from the side and a little to the rear thereof.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a machine for finishing button-holes embodying means for guiding the fabric, leather, &c., containing the button-hole in both transverse and longitudinal directions, so as to form stitches across the unfinished end of the button-hole, and then over-stitch the same, as will be hereinafter set forth.

Referring to the drawings, A represents a table, and B the clamp for the fabric, leather, &c., containing the button-hole.

A^{*} represents an upright piece of metal of the shape of the opening of a button-hole, which forms a guide for the button-hole to be finished, which is to be fitted on said piece, and thus centered for producing true and uniform work.

The clamp B is pivoted to a longitudinally-movable slide, C, which is fitted between guides D, which are attached to a transversely-extending slide, E, the latter being fitted between guides F, which are secured to the table A. Projecting laterally from the inner end of the slide C is an arm, G, and engaging

with opposite sides thereof are lugs H H, which are secured to a bar, J, which extends longitudinally above the table, and is pivoted to a vertical bar, K, which is pivoted to a support, L, and carries at its upper end a rocking follower, M, which enters the cross-grooves N of a switch-cam, P, the latter being secured to the driving-shaft A' of the machine.

Secured to the table near the inner end of the slide C is a lifting cam or abutment, Q, with which is adapted to engage the nose of a bar, R, which is pivoted at the end opposite to its nose to a bar, S, which extends horizontally and transversely on the table A, and is pivoted thereto, said bar R having a lateral projection or pin, *a*, which serves to hold the bar J in elevated position. To said bar R, intermediate of its ends, is pivoted a vertical bar, T, whose upper end is pivoted to the support U.

V represents a horizontal sliding bar, which is sustained adjacent to the support U, and has a shoulder, W, which is adapted to engage with the walls of a recess or notch, X, formed in the periphery of the clutch-pulley Y, which is fixed to the driving-shaft A' of the machine. The bar V has at its outer end an arm which loosely enters a groove in the hub of the driving-pulley Z, which latter is loose on the driving-shaft and adapted to be moved to and from the pulley Y, the latter having a stop, B^x, which may be engaged by the shoulder C' on the pulley Z.

Pivoted to the sliding bar V is a bar, D', which is mounted on a support, E', and has its lower end adapted to engage with the heels of the pawls F', which are hung on a transversely-sliding bar, G', which is located above the table A and has its ends pivoted to levers H' J', which are mounted on opposite sides of the table A.

Motion is imparted to the sliding bar G' by means of a pivoted lever, K', which is connected at its lower end with said bar, and has its upper end engaged by a cam, L', on the driving-shaft A'. The noses of the pawls F' engage with a rack-bar, M', which is supported on the table A and formed with a nose, N', which is adapted to enter a notch or recess, P', on the adjacent side of the pivoted bar S. On the side of the bar S is a stop, Q', which, when

the bar M' returns to its normal position by the action of the spring R', is in such position that said bar strikes said stop, the stop being mainly adapted to engage with the end of the lever J' and prevent motion thereof.

S' represents a bar or lever which is pivoted to the side of the table, and has a notch, T', into which drops a stud or roller, U', on the bar S. The end of the lever S' opposite to the bar S is pivoted to a sliding bar, V', which carries an arm, W', the latter being located under the dogs or pawls X', the noses or points whereof engage with a ratchet or rack bar, Y', which is attached to the slide E, so that when said arm W' is moved in one direction by the bar V' the pawls are raised clear of the rack-bar, and in the other direction the pawls engage with said rack-bar and impart motion thereto, said pawls being hung on a rocking arm, Z', which is operated by an arm, Z², and a rock-shaft, Z³, the latter receiving motion from the driving-shaft of the machine in any suitable manner.

To the guides D, which are secured to the slide E and move therewith, are pivoted dogs B', with one of which the lever or arm J' is adapted to engage, and with the other an arm or lever, H², is adapted to engage, said arm H² being pivoted to the table A and connected with the arm or lever H'.

Dogs B² are pivoted to the table A and have their inner end beveled and located adjacent to the sides of the slide E, their front ends carrying pins B³, which are located under the dogs B', springs B⁴ being employed for pressing the dogs B² downwardly.

The pivoted arm or bar S has a spring, B⁵, the sliding arm or bar G' has a spring, B⁶, and the lever S' has a spring, B⁷, for restoring said parts to their normal positions or causing the return motions thereof.

The stop B^x is pivoted to the clutch-pulley Y, and has a pin, B⁸, which enters a segmental slot, B⁹, in said pulley. A spring, B¹⁰, is employed for returning said stop to its normal position, said spring being suitably secured to the pin B⁸ and a proper part of the pulley.

The operation is as follows: The material having the button-hole stitched around the eye and along both sides which is to be finished is placed on the guide A^x and clamped, and power applied to the driving-shaft, whereby the several parts of the machine are set in motion. The wheel Z, being primarily disengaged from the wheel Y, is moved toward the needle-operating arm by the bar V, so that it is clutched with said wheel Y. An elbow-lever, B¹¹, is pivoted to the machine, and, with the treadle-connection B¹², pivoted to one end of said lever B¹¹, operates the said bar V by means of a stud on said bar. As the wheel Z is rotated rapidly and its shoulder C' strikes the stop B^x, the latter yields, and, owing to the spring B¹⁰, the wheel Z is prevented from abruptly engaging with the wheel Y. The cam L' moves the bar or lever K', thus operating the sliding bar G', and conse-

quently the levers or bars H' J' H². The levers J' H² alternately bear against the dogs B', it being noticed that the slide E has its guide D of one side in contact with the beveled end of the adjacent dog B², as seen in Fig. 4; hence the dog B² is lowered and the bar J' comes in contact with the dog B', so as to move the latter. As the guide D of the opposite side is not in contact with the dog B², the spring B⁴ lowers the dog B² and raises the dog B', so that the bar H² may move freely under said dog B' without engagement therewith. The slide E is now moved, carrying with it the slide C in the transverse direction of the machine, and the button-hole follows said motion. The slide, having made its advance motion, reaches the opposite dog, B², raises it, and causes the dog B' to lower. Meanwhile the bar H² returns from under the dog B' and then again advances, whereby it strikes the dog B' and causes the slide E and its superimposed parts to return to the first position; and these operations are repeated until stopped in the automatic manner hereinafter described. The action of the needle in this device is the same as in other and well-known machines having a merely rising-and-falling motion, and as the cloth is carried backward and forward the thread of the needle is caused to form transverse stitches on the edge of the button hole, as seen in Fig. 8. The pawls F' move with the sliding bar G' and advance and return over the ratchet or rack bar M', so as to move the latter the distance of one tooth each motion of said bar G'. When the last tooth of said bar is reached, the nose N' registers with the notch P', when the spring B⁵ forces the lever or bar S so that said nose N' and notch P' interlock, the stop Q' also abutting against the end of the lever J', so as to prevent motion thereof by reason of the straight edge of said stop abutting against the end of the said lever. As the lever J' is locked the bar G' is also locked, the upper end of the lever or bar K' being held from the cam so as not to receive motion therefrom. As the bar S moves, it advances the bar R, and the nose of the latter leaves the abutment Q, and thus drops, whereby the rod or bar J also drops and its lugs H H are in position to engage with opposite sides of the arm G on the slide C. The bar or lever K continues its oscillations due to the follower M and grooves N, and operates the bar J, whereby its lugs H impart movement in opposite directions to the slide C, whereby longitudinal motions are imparted to the button-hole, or at a right angle to the previous ones. With the motion of the bar S just above stated the stud or roller U' is placed in line with the notch or recess T', and the lever S' is thus permitted to move, whereby the bar V' moves outwardly, carrying with it the arm or pin W'. This permits the pawls X' to lower, and their points then engage with the rack-bar Y', thus imparting forward or transverse motion to the slide E and its superimposed parts, it being noticed that

the pawls are operated in opposite directions by the action of the rock-shaft Z^3 , connection Z^2 , and arm Z^1 , the said rock-shaft Z^3 receiving motion in connection with the driving-shaft of the machine; but as any ordinary mechanism can be employed for this purpose, and the same not constituting, in itself, any part of this invention, the same is not shown in the drawings. The button-hole thus receives the finishing stitches, which are over the first-named stitches and at a right angle thereto. When the full number of stitches have been made, the treadle is let go, and the wheels Z Y are unclutched and the machine is stopped.

As the lever D' is carried back by the sliding bar V , its lower end comes in contact with the heels of the pawls F' and raises the teeth thereof clear of the rack-bar M' . The lever T is also carried back by the bar V , owing to the stud V^2 thereon. This moves the bar S from the bar M' and clears the nose thereof. The spring R' then presses against the bar M' and returns it to its first position. The stud or roller U' also moves from the notch T' and rides on the inclined wall thereof, so as to move the lever S' , the effect of which is the movement of the pin or arm W' in an inward direction, thus raising the pawls X' clear of the ratchet or rack bar Y' . The bar S also unlocks the lever J' , and thus the parts are in their normal position, ready for repetition of the movements above stated.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A machine for finishing button-holes, provided with a slide having a clamp and a guide for holding the material with the button-holes therein, stitch-forming mechanism, and means connected with the driving-shaft and the said slide for transmitting reciprocating, longitudinal, and transverse motion to said slide, whereby an under row of stitches and an overlying row at right angles thereto may be made by the continuous action of the machine at the unfinished end of the button-hole, all substantially as described.

2. In a button-hole-finishing machine, the table A , in combination with the slide C , having guide-piece A^x and clamps B , the slide E , having attached thereto the guides D D for the slide C , the guides F F , in which the slide E reciprocates, secured to the plate A , and means, substantially as described, for imparting longitudinal or transverse motion to said slide C and transverse motion to the slide E , all substantially as and for the purpose set forth.

3. In a button-hole-finishing machine, the table A , having the slide C thereon, and provided with the arm G , a rod having lugs adapted to engage with said arm, a vertical bar pivoted to the said rod, and means, substantially as described, for oscillating said bar so as to impart motion to said slide, all substantially as described.

4. In a button-hole-finishing machine, the

slide C , longitudinally movable on the slide E , the slide E , transversely movable on the table A , the guides D D , secured to the slide E , the shaft A' , with means for rotating the same, the cam L' , mounted on said shaft A' , the lever K' , pivoted to the sliding bar G' , the bars H' J' H^2 , the dogs B' , pivoted to the guides D , and the dogs B^2 , pivoted to the table A and carrying pins B^3 and spring B^4 , all of said parts being combined and arranged substantially as and for the purpose set forth.

5. The slide C , with arm G , in combination with the bar J , having lugs H , means, substantially as described, for imparting a reciprocating rectilinear motion to said bar J , the bar R , with pin a , and means, substantially as described, for automatically lowering said bar R , so that said bar J may be engaged with the slide C , all substantially as described.

6. The slide C and arm G , connected therewith, in combination with the bar J , having lugs H , the vertical bar K , the follower M , and grooved switch-cam P , all substantially as described.

7. A machine for finishing button-holes having stitch-forming mechanism, and the sliding bar V , with shoulder W , means, substantially as described, for operating said bar V , and the loose pulley Y , engaged by said sliding bar V and mounted on the driving-shaft A' , the pulley Y being engaged by said shoulder W , all substantially as described.

8. A machine for finishing button-holes having stitch-forming mechanism, the sliding bar G' , the pivoted lever K' , the driving-shaft A' , with cam L' , the levers H' J' , pivoted to bar G' , the arm H^2 , connected to the arm H' , and the slide E , having dogs B' pivoted thereto, all substantially as and for the purpose set forth.

9. In a machine for finishing button-holes having a stitch-forming mechanism, the sliding bar V , in combination with the bar D' , pivoted to said bar V , the reciprocating sliding bar G' and means, substantially as described, for imparting motion to the same, the pawl F' , secured to said bar G' , the rack-bar M' , operated by said pawl, the slide C , with clamp B , and mechanism, substantially as described, for imparting a reciprocating longitudinal motion to said slide, all substantially as described.

10. In a machine for finishing button-holes having stitch-forming mechanism, the rack-bar M' , having nose N' , with mechanism, substantially as described, for imparting a step-by-step movement to the same, in combination with the bar S , having a notch adapted to register with the said nose N' , the slide C , and means, substantially as described, intermediate of said bar S and said slide, for operating the latter, all substantially as described.

11. In a machine for finishing button-holes having stitch-forming mechanism, a slide with cloth-clamp, and the dogs B' , pivoted to said slide, the table A , having dogs B^2 pivoted thereto, and means for operating said dogs B^2 ,

which dogs are adapted to be engaged by said slide, means for imparting motion to said slide, and the spring B⁴, all combined substantially as described.

5 12. The table A, with lifting-cam Q, in combination with slide C, having arm G, stitch-forming mechanism, the rods J, with lugs H H, and arm supporting said rod J and having a projection resting on said cam Q, and means, 10 substantially as described, for moving said supporting arm and thereby lowering the said rod J, whereby the lugs H H thereon become engaged with the arm G, all substantially as described.

15 13. The table A, in combination with slide C, having arm G and dogs B', the bar J, with lugs H, the levers H', H², and J', stitch-forming mechanism, the sliding bar G', with means, substantially as described, for imparting re- 20 ciprocating motion thereto, the pawls F', the rack-bar M', with nose N', the pivoted bar S, with recess P' and stop Q', and the spring B⁵, all substantially as described.

25 14. In a button-hole-finishing machine having stitch-forming mechanism, the table A, in combination with slide C, having cloth-clamp thereon, the arm G on slide C, the rod J, with lugs H H, adapted to engage the said arm, the vertical bar K, connected to said rod J, and 30 means, substantially as described, for oscillating the said bar K, all substantially as and for the purpose set forth.

35 15. In a button-hole-finishing machine having stitch-forming mechanism, the slide C, longitudinally movable on the slide E, the slide E, having the guides D D secured thereto and transversely movable on the table A, the cam L', mounted on the shaft A' of the stitch-forming mechanism, the lever K', pivoted to 40 the sliding bar G', mechanism, substantially as described, intermediate the said sliding bar G' and the slide, for imparting transverse motion to the said slide, the pawls F', the sliding rack-bar M', having nose N', the pivoted bar 45 S, with notch P' and spring B⁵, all combined substantially as described.

50 16. The slides C and E, the former having arm G, the rod J, with lugs adapted to engage said arm G, the shaft A', mechanism, substantially as described, intermediate of said shaft A' and said rod, for imparting motion to said rod, the pivoted bar S, the rod R, pivoted to said bar S and having the pin a, the lifting-cam Q, secured to the table A, and mechanism, 55 substantially as described, for operating said bar S, all combined and arranged substantially as described.

60 17. A button-hole-finishing machine having stitch-forming mechanism, the shaft A', with clutch-pulley Y, mounted thereon and having a segmental slot, and provided with a stop pivoted thereto and having a pin, and a spring connected to said stop and pulley, the pin of said stop working in said slot of the clutch-

pulley, and the slide C, with means, substan- 65 tially as described, connected to said driving-shaft and said slide, for securing longitudinal and transverse motion to said slide, all of said parts combined substantially as described.

18. A button-hole-finishing machine having 70 the shaft A', with pulley Y, having a yielding stop, the wheel Z, with a shoulder adapted to engage said stop, the slide-bar V, having an arm engaging said wheel Z, means, substan- 75 tially as described, for operating said slide-bar V, and the slide C, with means, substantially as described, intermediate of said slide and driving-shaft and connected thereto, for im- 80 parting longitudinal and transverse motion, as described, to said slide, all substantially as described.

19. A button-hole-finishing machine having stitch-forming mechanism, the driving-shaft of which is provided with clutch-pulley Y, having yielding stop B^x pivoted thereto, and 85 provided with the pin B^s, and the wheel Z, having shoulder C', and means, substantially as described, for engaging and disengaging said pulley and wheel, all substantially as de- 90 scribed.

20. In a button-hole-finishing machine hav- ing stitch-forming mechanism, a clutch, the slide-bar V, provided with the stud V², the lever T, pivoted to a support and to the rod R, the rod R, pivoted to the bar S, the bar S, 95 with notch P', and the bar M', with nose N', and the spring R', all combined substantially as described.

21. In a button-hole-finishing machine hav- ing stitch-forming mechanism, the slide-bar 100 V, the lever D', pivoted to said slide-bar, the sliding bar G', and means, substantially as described, for imparting reciprocating motion thereto, the pawls F', hung on the sliding bar G' and adapted to be raised by the lower end 105 of said lever D', all substantially as and for the purpose set forth.

22. In a button-hole-finishing machine, the slide E, having a cloth-clamp and a rack-bar, Y', attached to said slide, the pawls X', 110 adapted to engage the said rack-bar, the rock-shaft Z', on which said pawls are secured, and mechanism, substantially as described, for oscillating said rock-shaft, all combined sub- 115 stantially as and for the purpose set forth.

23. In a button-hole-finishing machine, the slides C and E, with guides substantially as described, the pivoted bar S, having roller U', and means, substantially as described, for vi- 120 brating said bar, the bar S', having notch T', and the bar V', having the pin W', adapted to raise the pawls X' from the rack Y', all combined substantially as and for the purpose set forth.

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