

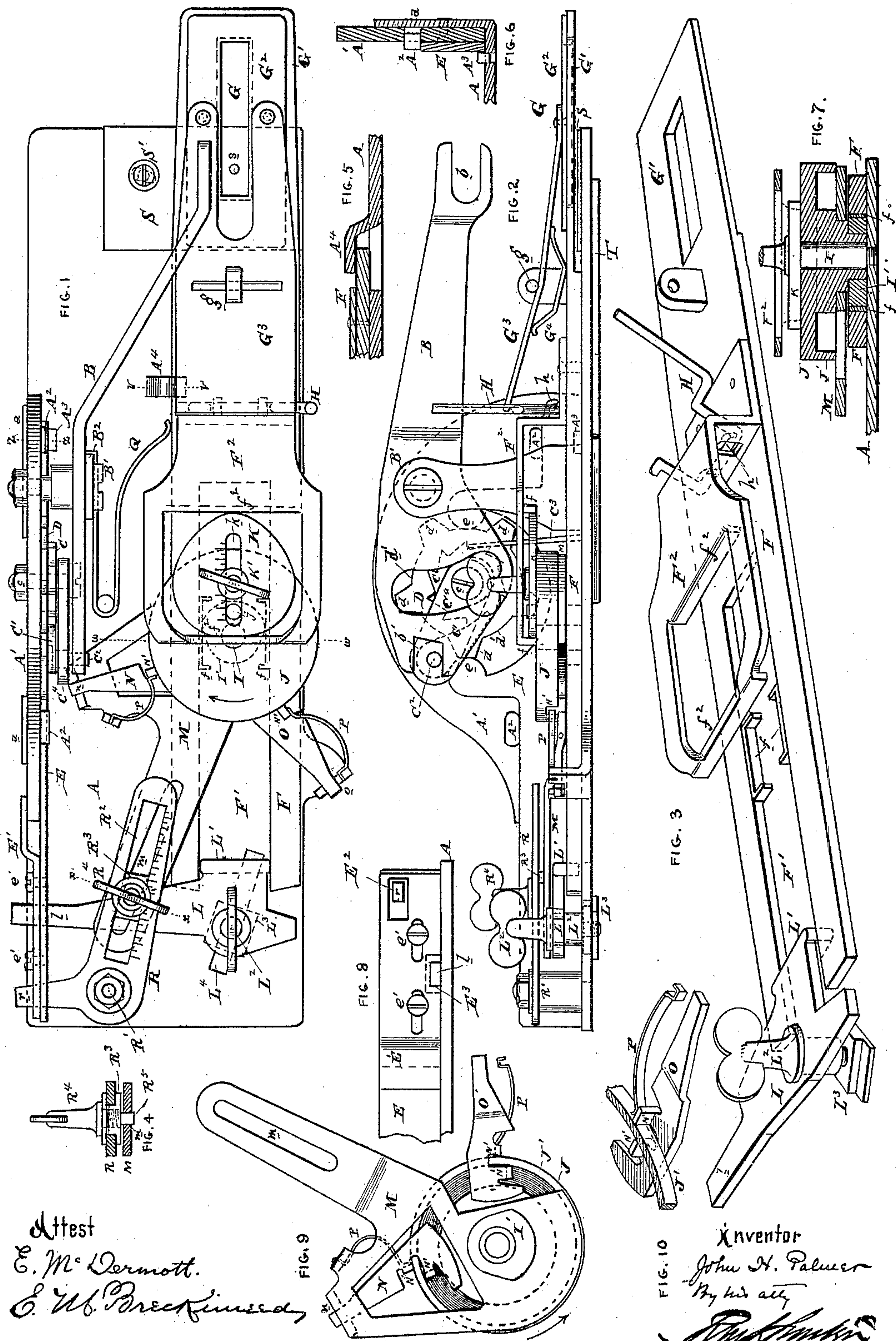
(No Model.)

J. H. PALMER.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 444,846.

Patented Jan. 20, 1891.



Attest
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UNITED STATES PATENT OFFICE.

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BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 444,846, dated January 20, 1891.

Application filed April 21, 1887. Serial No. 235,623. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. PALMER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Button-Hole Attachments for Sewing-Machines, of which the following is a specification.

My invention has reference to button-hole attachments for sewing-machines; and it consists in certain improvements upon the invention set out in Letters Patent No. 335,836, February 9, 1886, all of which are fully set forth in the following specification, and shown in the accompanying drawings, which form part thereof.

The object of my invention is to overcome the objections which heretofore existed to the construction set out in said Letters Patent, and produce an automatic machine which shall be simpler in construction and more durable and perfect in operation.

In the drawings, Figure 1 is a full-sized plan view of a button-hole attachment for sewing-machines embodying my invention. Fig. 2 is a side elevation of same. Fig. 3 is a perspective view of the cloth-clamp-operating lever and the adjustable lever for vibrating it. Fig. 4 is a cross-section of Fig. 1 on line xx . Fig. 5 is a cross-section on line vv of Fig. 1. Fig. 6 is a cross-section on line zz of Fig. 1. Fig. 7 is a cross-section on line ww of Fig. 1. Fig. 8 is an elevation of one end of the reciprocating plate, showing the adjustment and its connection with the frame of the machine, the said plate being used to impart motion to the cloth-clamp-operating lever. Fig. 9 is an inverted plan view of the feeding-wheel, the clutch-operating device therefor, and the cam for oscillating the cloth-clamp-operating lever; and Fig. 10 is a perspective view showing the construction and action of one of the friction-clamps.

A is the bed or base plate.

B is the operating-lever, which is vibrated by suitable connection with the needle-bar. This lever is pivoted on a bushing B' , clamped between the vertical portion A' of the base-plate (secured to plate A by part a) and the upright standard B^2 . By this means a most perfect and rigid connection is obtained be-

tween the parts A' and B^2 , thereby giving a fixed and durable fulcrum for the lever B. The end of the lever is provided with an enlarged hole or slot b' . Into this slot a pin C^2 projects, which pin is connected with a radius-bar C^4 , pivoted to the stud c on the plate A' . This radius-bar carries a pawl C' , which works in contact with the ratchet-wheel.

The ratchet-wheel C, with which the pawl C' meshes, is securely attached to the cam D, which has an uneven number of projections d and a corresponding number of depressions upon its outer edge or periphery, the number of which projections and depressions are uneven, so that when the cam is placed between the opposite rounded surfaces e of the slide-plate E and turned around upon its fulcrum or axis c the slide-plate is caused to reciprocate. The slide-plate E stands upon the base-plate A and rests against the vertical part A' , being held thereto by the plate E' , which is secured to the plate E and is bent around the other face of part A' . This plate E is prevented from vertical movement by the lugs A^2 , which are punched part way through the vertical portion of the base-plate A' , and is also prevented from lateral movement at the end farthest from the plate E' by a part A^3 , partly punched up through the base-plate A, holding the plate E against the plate A' . The spring C^3 prevents the ratchet-wheel turning backward. It is necessary that the reciprocation of the slide should be in proportion to the vibrations of the lever B as one to two, and to secure this proportion the number of teeth on the ratchet-wheel C is twice that of the projections on the cam D, and as the ratchet-wheel is advanced in its rotation one tooth by each full vibration of the lever it follows that the slide is moved one part of its reciprocation only for each full vibration of the said lever. The outer curvature of the parts d and d' of cam-wheel D have their working faces made curved and concentric.

To the base-plate A the lever L is pivoted by its fulcrum-pin L^2 , which is made adjustable in an oblique slot L^4 in the base-plate by means of the adjustable block L^3 . The lever L is arranged at a higher level than the cloth-

clamp-operating lever and is provided with a downwardly-extending throat-arm L' , which works in the slot F' of the cloth-clamp-operating lever F . The free end l of the long arm of the lever L is passed through a slot in the slide-plate E , being retained in the desired position within the slot by an adjustable plate E^3 for the reception of said end of the lever and which plate is secured to the slide-plate by screws e and by means of which the said lever L directly receives its vibration.

The cloth-clamp-operating lever F is adjustably pivoted on the vertical stud or pin I through the mediation of the cam I' and upon which it is vibrated by the lever L and rests upon the base-plate.

F is the cloth-clamp-operating lever and has a vibrating reciprocating and oscillating motion imparted to it. It is vibrated by lever L , reciprocated by cam K , and oscillated by cam I' . It is provided with a longitudinal slot F' , in which the cam I' works to oscillate it on L' as a fulcrum, and to prevent excessive wear small slides f are provided between the cam I' and the sides of the slot F' . The other end of the lever F is extended to form the base or lower-jaw G' of the cloth-clamp G . This lever is also provided at or near its middle with a bent part F^2 , which is formed with faces f^2 , between which the feed-cam K works. The slot L^4 is made oblique so that in adjusting the lever L to or from the pin or stud I the part L' shall move in the slot F' of the lever F in such a manner that the adjustment does not displace the normal operative position of said lever.

It will be observed that when vibrating the fulcrum of the lever F is on the cam I' , but when oscillating it is upon the part L' of lever L , thus changing the order of the lever during the performance of its work. The forward end of the lever is held down by a lug A^4 , forced up from the base-plate A , as shown in Figs. 1 and 5, and the lost motion in the pivoting of said lever is compensated for by the spring Q , which always maintains the said lever against certain faces of its fulcrum, preventing loose shackling motion or rattling of the parts.

The upper jaw G^2 of the cloth-clamp is loosely connected by means of rivets to a lever G^3 , held in position by a lug and working against a horizontal fulcrum-pin g , secured in said lug. The other end of the lever G^3 is operated by a crank H , journaled to part F^2 by ears h , which when turned into the position shown in Fig. 2 causes the lever G^3 to be oscillated in a manner to clamp the cloth as said crank presses upon the under face of the lever G^3 , to which the clamping-jaw G^2 is connected.

G^4 is a spring placed under the lever G^3 , and is designed to hold said lever up against the fulcrum-pin g , and also cause the jaw G^2 to be raised when the hand-crank H is thrown back to remove the clamping action.

J is the feed-wheel, upon the upper and lower portion of which the cams K and I' are respectively secured. This feed-wheel is loosely supported upon a stud I , and upon its hub m is secured the cam I' , which works in the slot F' and against slides f of the lever F . The cam K works between the faces f^2 , and is provided with a slot k , into which a pin j on the feed-wheel projects, and through which slot the clamping-screw K' passes to adjustably clamp said cam upon the feed-wheel.

Pivoted concentrically with the stud I and located between the lever F and feed-wheel J is the vibrating lever-plate M , which is provided with a slot m , and carries pivoted to it at n a friction-clutch n' , which is provided with two jaws N' , (see Figs. 9 and 10,) which bite upon opposite sides of a vertical flange J' , arranged upon the periphery of the feed-wheel J , and this clutch is made to bind upon the flange by means of a spring P . O is a similar clutch, which is pivoted at o to the base-plate of the machine, but operates in the reverse direction, the object being to prevent backward movement of the feed-wheel during the return movement of the feeding-clutch N . From this construction it will be seen that as the plate N is vibrated the clutch end binds in one direction, moving the feed-wheel with it, but releases it when moving in the other direction, (leaving it in the custody of the clutch O ,) causing an intermittent rotary movement to said feed-wheel and its cam K for reciprocating the cloth-clamp-operating lever. This lever-plate is vibrated by a pin R^5 , which extends down into the slot m , and is an extension from the thumb-screw R^4 , which is clamped to the bell-crank lever R by means of a block R^3 , which is adapted to adjustment in the slot R^2 of the said lever R . (See Figs. 1 and 4.) The lever R is pivoted at R' to the base-plate, and its small end r passes through a slot E^2 in the slide-plate E , so that as the slide is reciprocated the lever R and lever-plate M are vibrated. By adjusting the screw R^4 and its block R^3 in the slot R^2 the throw of the plate M , with the fixed reciprocation of the plate E , may be increased or decreased, and thereby increase or decrease the amount of intermittent revolution of the feed-wheel J and its cam K , and correspondingly increase or decrease the amount of the intermittent reciprocations of the lever F and its cloth-clamp.

S is the needle-plate, and is provided with the needle-holes s , and is made adjustable by clamping-screws S' to suit various makes of machines.

The operation is such that the cloth-clamp is vibrated back and forth laterally by the lever L and simultaneously therewith intermittently fed forward by a step-by-step movement produced by the cam K and clutch-feeding mechanism, and after one row of stitches are formed to constitute one side of the button-

hole the clutch-clamp is oscillated by the action of the cam I', and the same operation as that first described is now carried into effect during the reverse movement of the clutch-clamp to form the other side of the button-hole.

While I prefer the construction shown it is evident that the minor details thereof may be modified without departing from the spirit of the invention.

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

1. In a button-hole attachment, the cloth-clamp-operating lever F, having slot F', the cam I' for oscillating it in forming the ends of the button-hole, and slides f, interposed between said cam and faces of the slot F', substantially as and for the purpose specified.

2. In a button-hole attachment, the main frame A A', the reciprocating plate E, guided against part A' of the main frame, and plate E' secured to plate E and extending upon the other face of part A' to hold plate E in position, and cloth-clamp-operating mechanism actuated by said reciprocating plate.

3. The combination of the vibrating cloth-clamp-operating lever F, having slot F', the lever L, having adjustable fulcrum-block L³

to vibrate lever F, the supporting-plate having the oblique slot L⁴, and a reciprocating plate to vibrate the lever L.

4. The combination of the reciprocating plate E, the cloth-clamp-operating lever, cams to actuate said lever, a feed-wheel, a pivoted lever M, having a slot m, a clutch device between said lever M and feed-wheel, a pivoted lever R, having slot R², connecting said lever M and plate E, and an adjustable connection between levers M and R, substantially as and for the purpose specified.

5. The combination of the reciprocating plate E, the cloth-clamp-operating lever, cams to actuate said lever, a feed-wheel, a pivoted lever M, having a slot m, a clutch device between said lever M and feed-wheel, a pivoted lever R, having slot R², and scale to indicate the different throws of the feed-wheel connecting said lever M and plate E, and an adjustable connection between levers M and R, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

JOHN H. PALMER.

Witnesses:

R. M. HUNTER,

BUTLER KENNER HARDING.