

W. SCHOTT.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 292,591.

Patented Jan. 29, 1884.

Fig. 1.

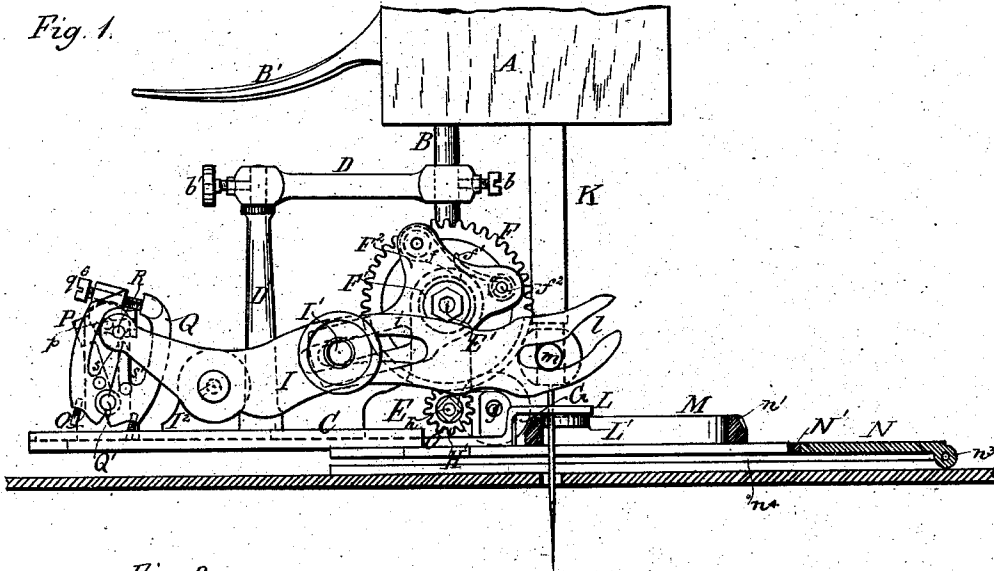


Fig. 2.

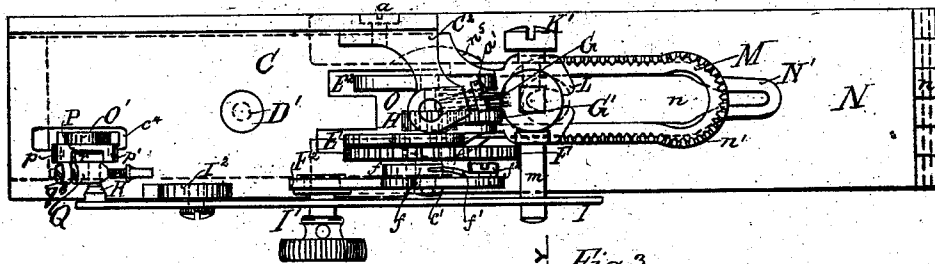


Fig. 3.

Fig. 4.

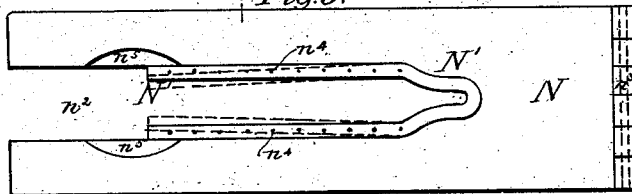
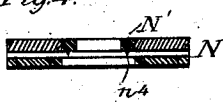
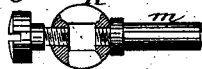


Fig. 5.



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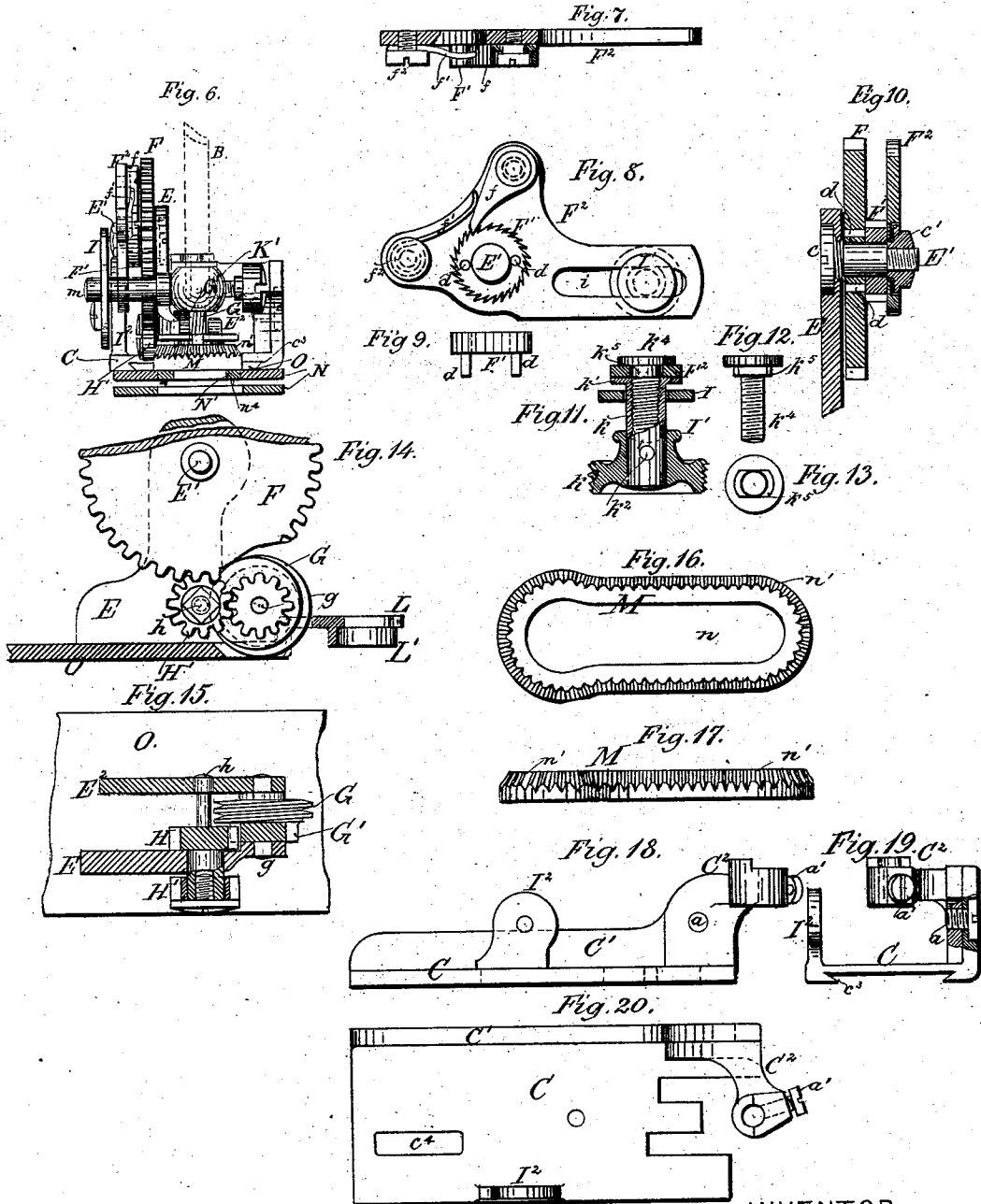
ATTORNEY

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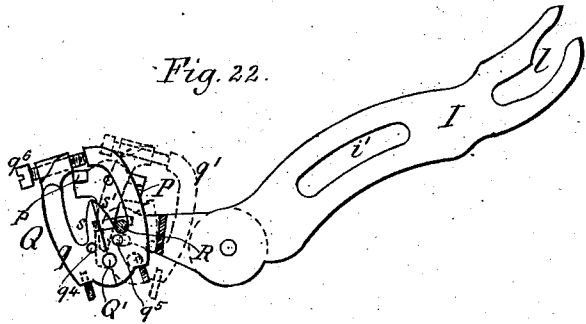


Fig. 22.

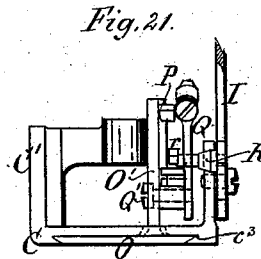


Fig. 21.

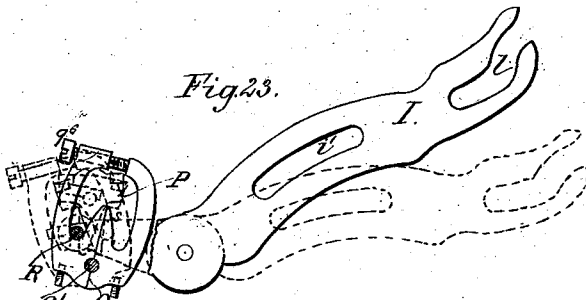


Fig. 23.

Fig. 33.

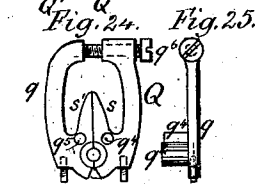
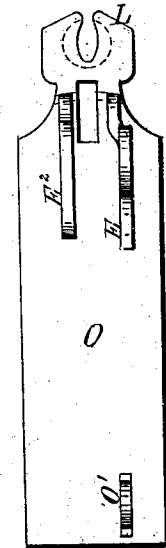


Fig. 24. Fig. 25.



Fig. 27. Fig. 28.



Fig. 29.



Fig. 30.

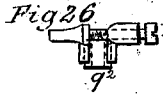


Fig. 26.

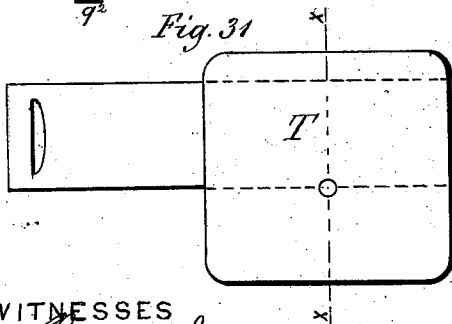


Fig. 31.

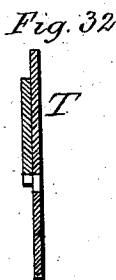


Fig. 32.

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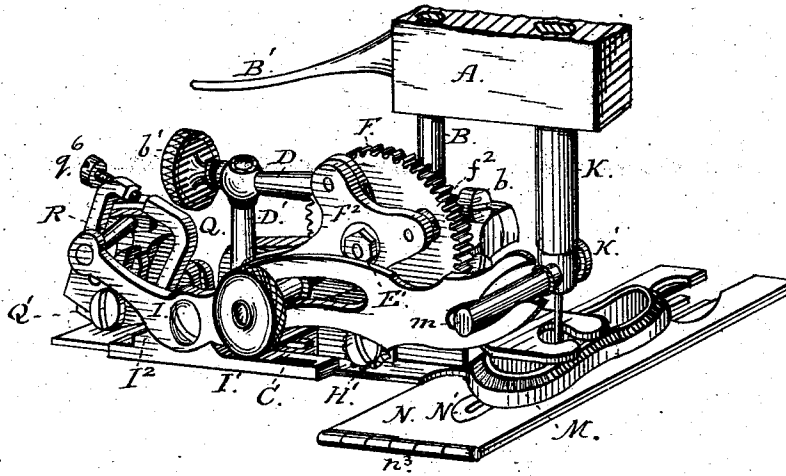
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Fig. 34.



Attest;
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Inventor;
 William Schott,
 By J. W. Robertson,
 Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM SCHOTT, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SCHOTT BUTTON HOLE ATTACHMENT COMPANY, OF SAME PLACE.

BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 292,591, dated January 29, 1884.

Application filed June 21, 1883. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM SCHOTT, a citizen of the United States of North America, and a resident of the city, county, and State of New York, have invented a new and useful Improvement in Button-Hole Attachments for Sewing-Machines, of which the following is a specification.

The object of this invention is to furnish a button-hole attachment for sewing-machines, adapted to be applied to most of the sewing-machines now in use without material alteration in them, and designed for stitching button-holes or eyelets.

The invention consists of certain mechanisms adapted to be connected with the head of a sewing-machine, to be used in connection therewith, the said mechanism embracing a form-plate of peculiar design rigidly fixed upon a removable cloth-clamp; devices for regulating the length and adjusting the bite of the stitches, and accelerating the movement of the form-plate on turning, and other novel devices for adapting the attachment to the work for which it is designed, all of which will be hereinafter fully set forth.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation, partly in section, of my improved button-hole attachment to sewing-machines in position. Fig. 2 is a plan of the same. Fig. 3 is a plan of the cloth-clamp, with the button-hole form-plate detached and the cloth-stretcher in position. Fig. 4 is a cross-section of the same on line *y y*, Fig. 3. Fig. 5 is a partly-sectional plan of my improved needle-bar clamp. Fig. 6 is a front elevation of the button-hole attachment. Fig. 7 is an enlarged plan, partly in section, of the slotted bell-crank lever, spring-pawl, and ratchet for transmitting motion from the needle-bar lever. Fig. 8 is an enlarged side elevation of the same. Fig. 9 is an enlarged plan of the ratchet. Fig. 10 is an enlarged sectional elevation, in reverse, of the main cog-wheel, its axle, and certain co-operating parts, and portion of their supporting-standard. Fig.

11 is an enlarged sectional elevation of the adjusting clamping device, connecting the needle-bar lever with the ratchet or bell-crank lever. Figs. 12 and 13 are details of the same. Fig. 14 is an enlarged partly-sectional side elevation, showing a portion of the main cog-wheel, the worm, and the intermediate pinions in position. Fig. 15 is an enlarged sectional plan of the same in position, with the main cog-wheel removed. Fig. 16 is an enlarged plan of the button-hole form-plate. Fig. 17 is an enlarged side elevation of the same. Fig. 18 is an enlarged side elevation of the carrier-plate. Fig. 19 is an enlarged partly-sectional end elevation of the same. Fig. 20 is an enlarged plan of the same. Fig. 21 is a rear elevation of the reciprocating mechanism attached to the reciprocating foot. Figs. 22 and 23 are side elevations of parts of the reciprocating mechanism in various positions. Figs. 24, 25, and 26 are details of the same, Fig. 24 being in reverse. Figs. 27 and 28 show further details. Figs. 29 and 30 show the needle-bar lever, stud, and cross-head. Figs. 31 and 32 are plan and sectional elevation, respectively, of the throat-plate especially adapted to this improvement. Fig. 33 is a plan of the reciprocating foot. Fig. 34 is a perspective-view, showing the attachment in position.

In the drawings, A represents the head of a sewing-machine; B, the presser-foot bar, and B' the lever thereof, by which it is elevated and depressed.

The carrier-plate C has one side or edge turned up at right angles, as shown at C', and on the forward end of this side C' is secured, by screw *a*, a lug or sleeve, C'. The lower extremity of the presser-foot bar B being entered into this sleeve C', a turn of the thumb-screw *a'* secures the carrier-plate C thereon, so that said plate and its attachments may be elevated and depressed with it.

A horizontal rigid clamp, D, is firmly secured to the presser-foot bar B, a little above its center, by a thumb-screw, *b*, and in the other end of said clamp D is inserted and rigidly held by a thumb-screw, *b'*, the reduced upper end of a post, D', which extends vertically upward from about the center of the car-

rier-plate C. By these means all lateral motion of the carrier-plate C and its attachments is prevented.

Fixed upon the reciprocating foot O is a standard, E, and on a horizontal axle, E', extending outward therefrom, and composed of screw c and nut c', are set so as to move freely thereon the main cog-wheel F, the ratchet F', and motion-transmitting bell-crank lever F², the ratchet F' having studs d, that project from its inner face and enter into the opposing face of the cog-wheel F, whereby motion given to the former is imparted to the latter.

On the inner face of the bell-crank lever F² is pivoted a pawl, f, that is held by a spring, f', also secured by a screw, f'', upon the lever F², engaged with the teeth of the ratchet F'', so that said ratchet F' and cog-wheel F are together partly turned or revolved at each upward reciprocation of the lever F².

Journalled in the standards E E² of the reciprocating foot O is a horizontal axle, g, carrying, firmly fixed thereon, a worm, G, and pinion G', said worm G being designed to gear with the button-hole form-plate, to give motion thereto; also journalled in the standards E E² is a shaft, h, having firmly fixed thereon pinions H H', the latter being held in place on the outside of the standard E by a screw, h', as shown. The pinion H gears with the pinion G' and the pinion H' with the main cog-wheel F, so that the motion of the latter is transmitted to the worm G.

The slotted end of the transmitting bell-crank lever F² projects rearward, and is connected or coupled with the needle-bar lever I by means of a clamping device, I', that passes through the slot i of the lever F² and the central slot, i', of the lever I. This clamping device I' consists of an internally-screw-threaded sleeve, k, having on one end an annular flange, k', while the other end is secured by pin k² in a thumb-nut, k³, and of a screw, k⁴, having a shoulder, k⁵, provided with two flat sides. The sleeve k is entered from the right or inside through the slot i' of the lever I. The nut k³ is then secured on the outer end of the said sleeve k, and the screw k⁴ is passed through the slot i of the lever F², so that the screw-shoulder k⁵ shall engage in the slot i of the lever F² and prevent the turning of the device I' therein; then, when the sleeve k is turned up tight, the bell-crank lever F² is firmly grasped between the head of the screw k⁴ and the flange k'.

The needle-bar lever I, that is pivoted on a standard, I², fixed on the carrier-plate C, has a forked forward end, as shown at l, and in this fork l is engaged the horizontally-projecting stud m of the needle-bar clamp K', whereby the motion of the needle-bar K is transmitted to the said lever I. This needle-bar clamp K' is the ordinary clamp with a stud screwed into it in line with its set-screw.

On the front end of the reciprocating foot O is soldered or otherwise rigidly secured a forward-projecting fork, L, on the free extremity

of which is fixed, about the split of the fork, a depending nearly-circular lip, L', open at the front, that is designed to hold the form-plate M in operative position and engaged with the worm G, and at the same time to serve as the pivot about which said plate M turns. The button-hole form-plate M has a central opening, n, and its beveled upper outer edges are toothed, as shown at n', to correspond to the threads of the worm G. Preferably, said form-plate M is firmly soldered or otherwise secured upon the upper face of the cloth-clamp N, over the longitudinal opening n² therein, to insure the synchronous movements of the two when the device is in operation.

The cloth-clamp N is constructed of two flat rectangular pieces of metal hinged together at one end, as shown at n³.

A flexible cloth-stretcher, N', consisting of a rod or bar of spring-steel or other metal, bent at the center, so that the legs are parallel and a little apart from each other, is designed to be soldered or otherwise secured on the upper side of the cloth-clamp N, beneath the form-plate M, and with its legs lying against the opposite sides of the slot or opening n of the clamps. The lower surfaces of the legs of this stretcher N' have short pins or teeth n⁴, projecting downward, for engagement with the cloth to be operated upon; and formed in the upper face of the clamp N are two opposite recesses, n⁵, for the convenience of the operator when desiring to compress the free ends of the stretcher N'.

When the device is to be worked, the cloth is placed in the cloth-clamp N, and then the stretcher N' is compressed, or its legs approached to each other by the operator, and when in this position the clamp N is closed, with the effect of forcing the pins n⁴ into the cloth, so that on the release of the said stretcher-legs they spring apart and stretch and hold that portion of the cloth which is between them to the tension best adapted for the stitching of a button-hole therein.

The reciprocating foot O is a flat rectangular plate of metal with beveled side edges, that is designed to be held in place and moved in the groove c² of the carrier-plate C. From the rear end of this foot O a post, O', rises vertically through the slot c⁴ of the plate C, and on the face of this post O' is pivoted a T-shaped shifting-dog, P, whose upper extremities are provided with lugs p p', respectively, and whose tail extends downward.

The oscillating frame Q is composed of two C-shaped sections, q q', respectively, hinged together at the bottom, with their concavities opposing, by a screw, Q', which also pivots said frame to the post O' of the foot O. Each section is provided with a horizontally-projecting stud, q⁴ q⁵, respectively, which are designed to extend inward on either side of the tail of the dog P. Through the top of the section q is inserted a set-screw, q⁶, whose end or point is engaged in the top of the section q', so that on turning said screw q⁶ the frame

Q may be spread open or contracted at will, for adjusting, shortening, or lengthening the throw of the plate O, and thereby shortening or lengthening at will the bite of the stitches, as will be hereinafter more fully set forth.

From the extreme rear end of the needle-bar lever I there projects inward a stud, R, having on its free end a cross-head, *r*, which extends through the oscillating frame Q, with its cross-head near the face of the dog P.

The parts being in the position shown in Fig. 1, if, now, the needle-bar K be raised, it has the effect of elevating the forward end of the lever I and depressing the rear end thereof. The stud R is then consequently forced down the inclined plane *s* of the oscillating frame Q with the effect of throwing or moving the foot of said frame Q and the reciprocating foot O forward, as indicated in full lines, Fig. 23, the desired length of a stitch. Then the downward movement of the needle-bar K depresses the forward end of the lever I and elevates the rear end thereof, and as this rear end rises the left-hand end of the cross-head *r* of the stud R is brought into contact with the lug *p* of the dog P, causing the head of said dog P to swing to the left when the frame Q is swung to the right, and vice versa. The tail *p*², coming in contact with the frame Q and pressing laterally thereagainst, cants the frame Q rearward, as shown in dotted lines Fig. 23. Then the upward movement of the needle-bar K again depresses the rear end of the lever I, whereby the stud R is forced down in contact with the inclined plane *s*' of the oscillating frame Q, with the effect of reciprocating the foot O rearward the length of a stitch, as shown in full lines, Fig. 22. The next downward movement of the needle-bar K elevates the rear end of the lever I, with the effect of bringing the right-hand end of the cross-head *r* in contact with the lug *p*' of the dog P, thereby swinging said dog to the right, so that its tail is brought in contact with the stud *q*² of the frame Q, to cant said frame forward, as indicated in dotted lines, Fig. 22. On the next upward movement of the needle-bar K, the rear end of the lever I is depressed, and the stud R is thereby forced down in contact with the inclined plane *s* of the frame Q, with the effect of reciprocating the foot O forward the length of a stitch, and in this manner by a repetition of these movements, the foot O is made to reciprocate at each upward motion of the needle-bar. The inclined planes *s s*' of the oscillating frame Q slope in opposite directions to each other from above downward, their perpendicular backs being normally in contact, and the said planes being normally separate or apart from each other the length of an ordinary button-hole stitch; hence, when these planes *s s*' are separated still farther, by the turning of the screw *q*², which expands the frame Q along the line that divides them, the downward movements of the stud R in contact with them must cause or create a longer throw or reciprocation of

the foot O and its attachments, and from this extreme the throw can be shortened by turning screw *q*² in an opposite direction, thus bringing the planes *s s*' nearer to each other.

By means of the clamping device I', which connects the levers F² I, the speed of the worm G, and thereby the speed of which the form-plate M moves, can be regulated, and thereby the distance between the stitches.

If, while the device is in operation, it is desired to decrease the speed of the worm G, and thereby the motion of the form-plate M, the operator takes hold of the clamping device I' and moves it rearward along the slots of the levers F² I until it reaches the rear end of the slot of the said lever F²; then he turns the nut *k*² tight, so as to firmly grasp the lever F² at its free end farthest from its fulcrum or axle; hence on its further movement said lever and its pawl *f* will describe a smaller arc of a circle, move over fewer teeth of the ratchet F' at each reciprocation, and consequently turn said ratchet F', and worm G, and intermediate cog-wheel and pinions through a shorter distance.

If it be desired to increase the speed of the worm G and form-plate M to their full extent, so that the stitches may be made farther apart, the operator moves the clamping device I' forward and clamps it at the forward end of the slot in the lever F². The movements of this worm and form-plate are ordinarily thus accelerated on the turning of the latter when the end or ends of a button-hole are being stitched, so that the stitches may not be crowded too closely together and retarded when the sides of the button-hole are being stitched.

To apply this device to a sewing-machine, the ordinary needle-clamp, presser-foot, and throat-plate are first removed, and then the operator moves the presser-bar lever B', and thereby raises the presser-foot bar B, when the device is fixed in place, as set forth. The throat-plate T, which from its form is especially adapted to this improved attachment, as it forms a broad bearing for the clamp N of the machine, and the improved needle-clamp for the ordinary one, and the material to be operated upon is placed over the throat-plate in the usual manner. The presser-bar lever B' is operated to force the presser-foot bar B down, whereby the reciprocating foot O is suitably set upon the work. The needle V being fixed in place and threaded, and the device being in position, the sewing-machine is set in operation in the usual manner, and through the mechanisms hereinbefore described, the form-plate and cloth-clamp carrying the material to be operated on are together moved, revolved, and reciprocated beneath the needle as the latter reciprocates up and down in making the stitches.

I deem the worm G important in the relation shown. Where cog-gearing is employed, the weight of the cloth hanging down upon

one side of the machine is liable to move the gear; but the worm will effectually resist all such tendency.

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

1. A button-hole attachment to sewing-machines, containing the following elements: a fixed carrier-plate for supporting a reciprocating foot; a reciprocating foot supporting the mechanism for moving the button-hole form-plate and cloth-clamp; a device for reciprocating the reciprocating foot and regulating the bite of the stitches, comprising an adjustable oscillating frame and a dog connected with the reciprocating foot; a lever having a terminal cross-head operated by the needle-bar and operating the oscillating frame; a clamping device for adjusting or regulating the distance between the stitches; a combined cloth-clamp and button-hole form-plate; a worm for transmitting motion to the same; means, substantially as described, for communicating motion from the needle-bar lever to said worm, and a cloth-stretcher, all combined and operating as herein shown and described.
2. In a button-hole attachment to a sewing-machine, the combination, with the reciprocating foot and the lever operated by the needle-bar, of an oscillating frame provided with oppositely-inclined planes, a dog pivoted on a standard that is rigidly fixed on the reciprocating foot, means, substantially as described, for connecting said lever and dog and said dog and frame, all arranged and operated substantially as herein shown and described, whereby said foot is reciprocated, as set forth.
3. In a button-hole attachment to a sewing-machine, as a means for transmitting motion from the lever operated by the needle-bar to the reciprocating foot, for reciprocating the latter and regulating the bite of the stitches, an adjustable oscillating frame consisting of two sections hinged together, and provided with two vertical oppositely-inclined planes and an adjusting-screw, and pivoted on the rigid reciprocating foot-post, a pivoted dog, and means for communicating motion from the said dog to the said two-part frame Q, substantially as herein shown and described.
4. In a button-hole attachment to a sewing-machine, the combination, with the reciprocating foot O, post O', dog P, having lugs pp' , lever I, provided with cross-headed stud R, having cross-head r , and hinged sectional oscillating frame Q, having inclines $s s'$, of the screw q^a , substantially as herein shown and described, whereby said frame may be contracted or expanded, its inclined planes adjusted relatively to each other, and the length of the reciprocation of the foot O and consequent bite of the stitches be adjusted or controlled, as set forth.

5. In a button-hole attachment to a sewing-machine, provided with a reciprocating foot and a form-plate, as a means for turning the form-plate, the combination, with said form-plate and a cloth-clamp, of a worm supported on the reciprocating foot, and actuated by suitable mechanism connected with said worm, substantially as herein shown and described.

6. In a button-hole attachment to a sewing-machine, of the character herein described, the combination, with the lever I, operated by the needle-bar, and pivoted upon the carrier-plate C, and the lever F², operating through suitable mechanism to revolve the form-plate, of an adjustable clamping device connecting the two levers, and adapted to transmit the motion of the one to the other, substantially as herein shown and described.

7. In a button-hole attachment to a sewing-machine, provided with a cloth-clamp, an elastic spring cloth-stretcher provided with downward-projecting pins, substantially as herein shown and described, said stretcher being attached to said clamp, and adapted to be compressed and to return to its normal position, as and for the purposes set forth.

8. The combination, with the grooved carrier-plate C, and reciprocating foot O, and connected mechanism for transmitting motion from the needle-bar-operated lever I to the form-plate M, of the lever I, supported by the carrier-plate, lever-stud R, provided with cross-head r , sectional oscillating frame Q, provided with studs $q^1 q^2$, screws $Q^1 q^2$, pivoted dog P, provided with lugs pp' , and post O', substantially as herein shown and described, whereby the said foot O may be reciprocated and its length of throw adjusted, as set forth.

9. In a button-hole attachment to a sewing-machine, as a means for determining the throw of the ratchet-lever F², and the consequent rapidity of the movements of the worm G, and of the mechanism for transmitting motion from the said lever to the worm and thereby determining the rate of movement of the form-plate M and cloth-clamp N, and consequently the distance between the stitches, the combination, with the lever I, having slot i , and ratchet-lever F², having slot i' , of the clamping device I', the sleeve k , and screw k^1 , having shoulder k^2 with two flat sides, constructed and operated substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 15th day of June, 1883.

WILLIAM SCHOTT.

Witnesses:

JACOB J. STORER,
ALBERT P. MORIARTY.