(No Model.) 3 Sheets—Sheet 1.

L. J. DRISCOLL.

BUTTON SEWING MACHINE.

No. 309,209. Patented Dec. 16, 1884.

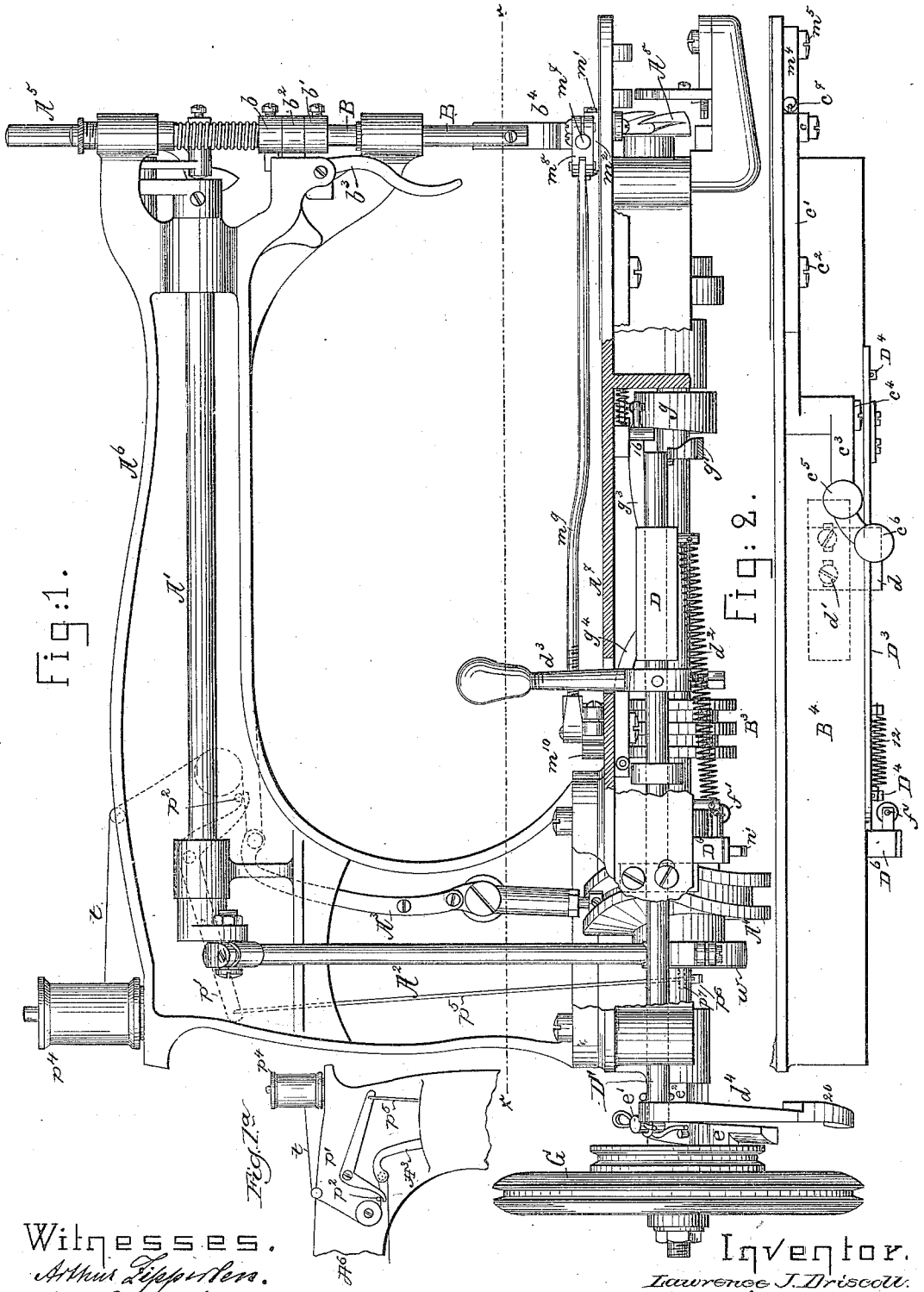

Fig. 1.

Fig. 2.

Witnesses.
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John F. C. Steinkart

Inventor.
Lawrence J. Driscoll.
by Crosby Gregory Attys.

(No Model.) 3 Sheets—Sheet 2.

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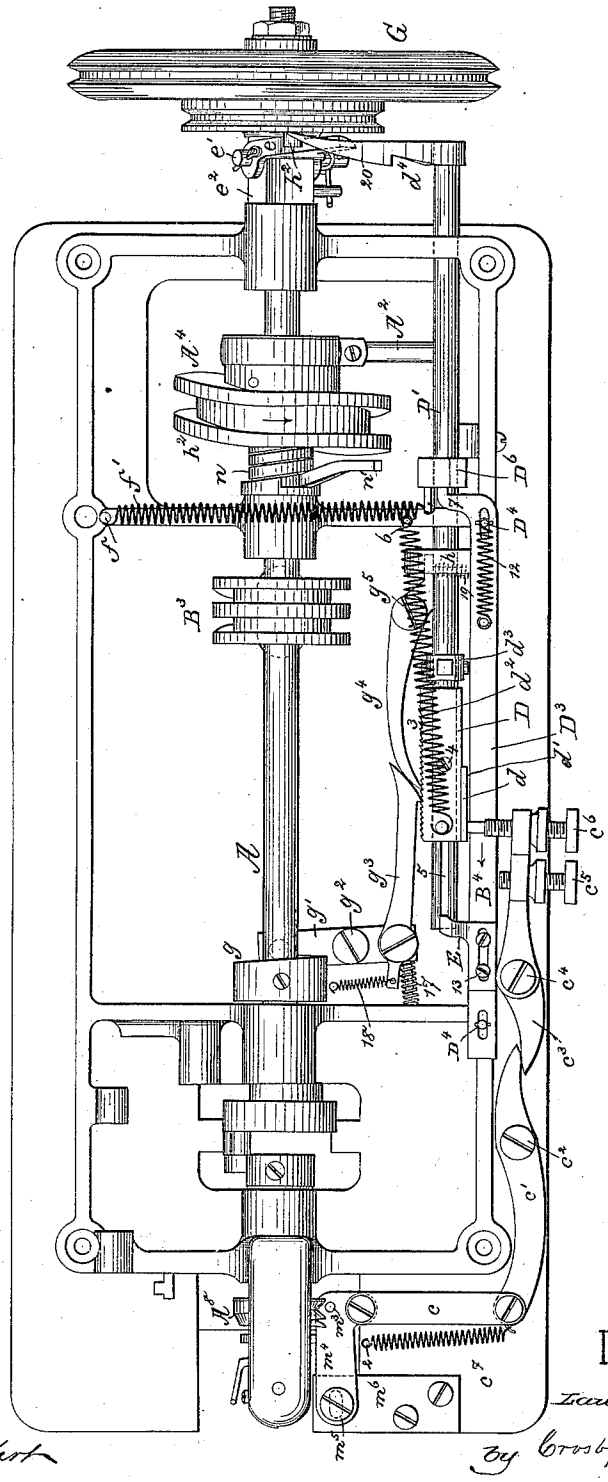
Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

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BUTTON SEWING MACHINE.

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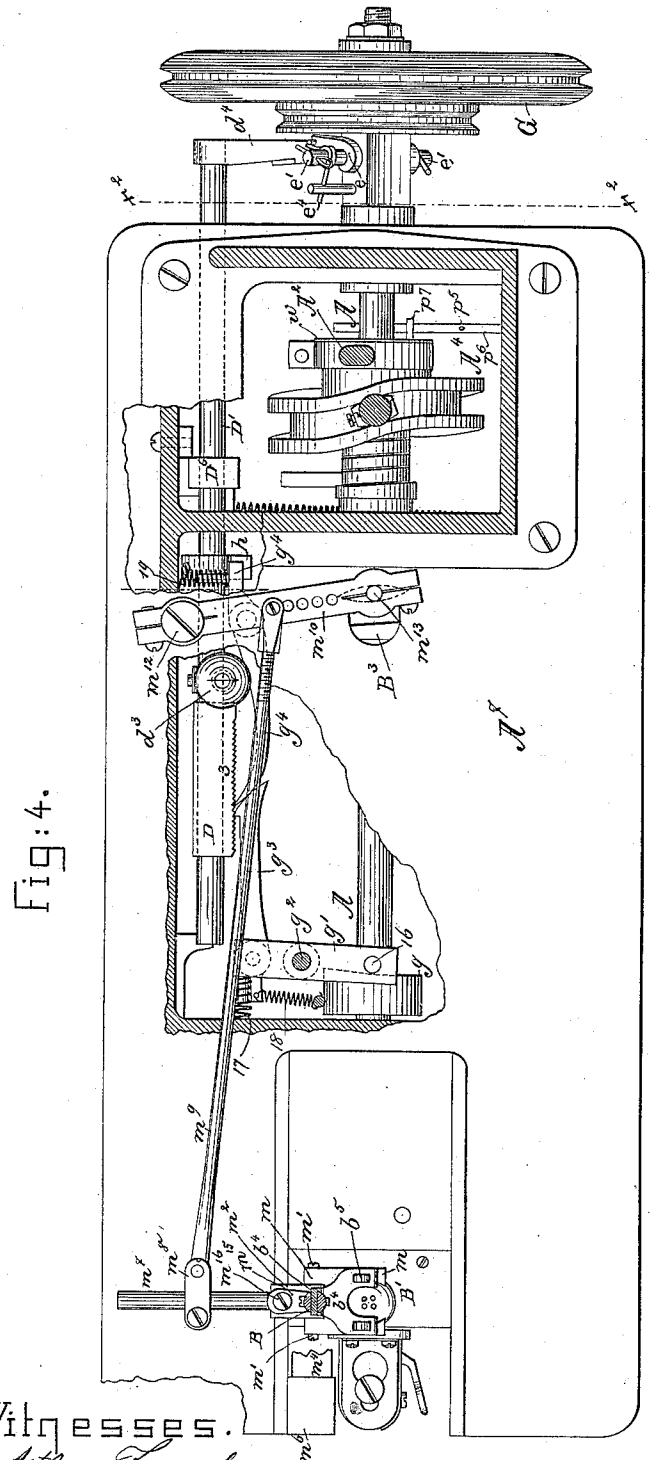

Fig: 4.

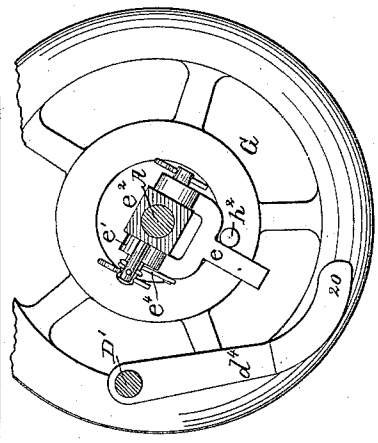

Fig: 7.

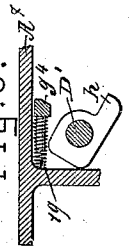

Fig: 8.

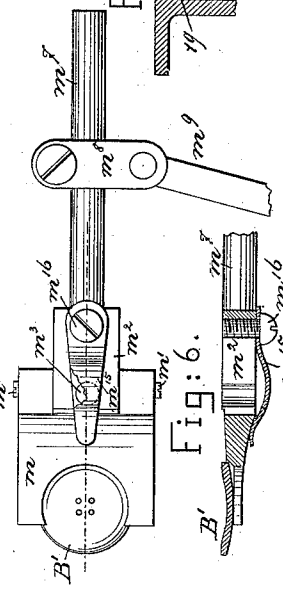

Fig: 5.

Fig: 6.

Witnesses.
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Inventor.
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by Crosby Gregory attys.

UNITED STATES PATENT OFFICE.

LAWRENCE J. DRISCOLL, OF SOMERVILLE, ASSIGNOR TO AMANDA M. LOUGEE, OF BOSTON, MASSACHUSETTS.

BUTTON-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 309,209, dated December 16, 1884.

Application filed December 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE J. DRISCOLL, of Somerville, county of Middlesex, State of Massachusetts, have invented an Improvement in Button-Sewing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention is an improvement on that described in the Letters Patent No. 290,981, dated December 25, 1883, to which reference may be had; and it relates to improvements in the mechanism whereby the machine is automatically stopped after having made a sufficient predetermined number of stitches through the garment or other article and through the eyes of a button located thereunder, as described in my said patent. I have also provided the machine with mechanism to operate the button-holder in such manner as to permit the use of buttons having either two or four holes.

This present invention consists, essentially, in a button-holder and co-operating devices to move the same both laterally and longitudinally with relation to the needle and stitching parts of the sewing-machine, whereby a button having four holes made through it and a garment or other article may be stitched the one to the other.

In the application hereinbefore referred to the number of stitches to be made in attaching each button was controlled by a mechanism actuated by a screw-threaded sleeve put upon the main rotating shaft, the said mechanism, among other things, being a carriage set in motion by the said sleeve and adapted to strike a shipper-rod. In this my present invention the shipper-rod is provided with a slide block under the control of a pawl which moves the said block intermittingly a step at each stitch, the said block in turn striking, preferably, an adjustable plate or projection on a locking device, herein shown as composed of a slide-bar notched to engage an arm of the shipper-rod, the movement of the locking device in one direction releasing the shipper-rod and permitting it to turn, so that an arm attached thereto will be thrown into the path of a dog fast upon the main shaft, and cause the said dog to be moved in a direction to disengage it from a projection upon a belt-pulley loose on the main shaft. At the same time that the dog is moved to release the belt-pulley the arm of the shipper-rod, which arm was just released from the locking device, is made to serve as a stop, against which one end of a stiff spring attached to the main shaft strikes to positively stop the said main shaft.

Figure 1 is a side elevation, partially broken out, of a sewing-machine embodying this present invention. Fig. 1^a is a detail of the thread-clamp shown in dotted lines, Fig. 1. Fig. 2 is a detail of the outer portion of the bed-plate, part of which is broken away from Fig. 1. Fig. 3 is an under side view of the machine represented in Fig. 1. Fig. 4 is a plan view of the parts of Fig. 1, below the dotted line x x, with part of the bed-plate broken away to show the devices below it. Figs. 5 and 6 are respectively enlarged details, showing in top view and longitudinal section the button-holder. Fig. 7 is a partial section of Fig. 4 on the dotted line x^2. Fig. 8 is a detail, to be referred to.

The main shaft A, needle-bar-actuating shaft A′, connecting-link A^2, take-up lever A^3, cam A^4, to operate it, needle-bar A^5, arm A^6, bed-plate A^7, and the rotating hook A^8, to co-operate with the usual eye-pointed needle carried by the needle-bar, are all substantially as common to the Wheeler & Wilson class of sewing-machines, on which I have herein shown my invention as applied. The presser-bar B has fast on it two collars, b b', between which is placed an arm, b^2, the hub of which is loose on the presser-bar, and the said arm is acted upon by the usual lifting-lever, b^3. The presser-bar, at its lower end, is provided with a presser-foot, b^4, forked at its front end and provided with anti-friction rolls b^5, which are adapted to bear upon the upper but inner side of the material composing the garment or other article to be stitched to the button B′, the said material at its lower but outer side resting upon the button-holder m substantially the same as that marked by like letter in my patent referred to. These anti-friction rollers in the presser-foot permit the button-holder to be moved longitudinally under the presser-foot without undue friction, and the presser-

bar, being arranged as shown and described, has the proper freedom of motion. The button-holder *m*—a forked jaw—is pivoted at *m'* upon a block, m^2, having its fulcrum m^3 (see Figs. 3 and 5) in an adjustable arm, m^4, secured by screw m^5 to a lug, m^6, fast to the under side of the bed-plate, the said fulcrum-pin m^3 extending loosely through a slot in the usual throat-plate. The block m^2 has a tail-piece, m^7, which is provided with a clamp, m^8, to which is pivoted a rod, m^9, the opposite end of which is adjustably connected (see Fig. 4) with an arm, m^{10}, pivoted at m^{12} on the bed-plate, and provided at its inner end with a pivoted shoe (see dotted lines, Fig. 4) placed loosely on the stud m^{13}, the said shoe entering the grooves of the switch-cam B^3, substantially such a cam as represented in my said patent, the said switch-cam effecting the movement of the button-holder about its fulcrum m^3, to cause the button-holder to be vibrated as is necessary to enable the needle carried by the needle-bar to descend first through one and then through another hole of the pair of holes in the button at one side of its center, preferably putting twelve stitches in the said two holes, when the button-holder will be moved longitudinally and automatically, as will be described, to enable other twelve stitches to be made through other two holes in the same. The button-holder *m* is kept down upon the button by a spring, m^{15}, connected with the head m^2 by a screw, m^{16}. The arm m^4, Fig. 3, is connected by link *c* with an intermediate lever, *c'*, pivoted at c^2, which lever acts upon one end of a lever, c^3, having its fulcrum c^4 at the under side of the bed-plate A^7, the outer end of the said lever c^3 having two adjusting-screws, c^5 c^6, the former of which, by striking against the flange B^4 of the bed-plate, (see Figs. 2 and 3,) stops the movement of the outer end of the lever c^3 due to the spring c^7, the said spring being permitted to act or cause the screw c^5 to strike the said flange when the end of the screw c^6, which is held against the adjustable stitch-regulating plate *d* of the slide-block D by the said spring, passes beyond the end of the said screw c^6, as is the case when the first two of the four holes in the button have been filled with stitches. As soon as the plate *d* is moved beyond the end of the screw c^6 the spring c^7, one end of which is connected with a fixed stud, 2, effects the movement of the arm m^4 and its attached fulcrum-pin m^3 and button-holder, and moves the same longitudinally far enough to place the second pair of holes in the button under the needle, and thereafter, by the vibration of the button-holder, the button will be moved to enable the needle at each descent to enter one of the second pair of holes to receive stitches through them. Adjustment of the screw c^5 accommodates the longitudinal movement of the button-holder to the distance apart of the pair of holes to be entered by the needle. The stitch-regulating plate *d* is adjustably attached to the block D by screws *d'*. (Shown best in dotted lines, Fig. 2.) The block D, a square block in cross-section, and placed loosely on the shipper-rod D', is provided at its inner side with a series of ratchet-teeth, as at 3, and a stud or pin, 4, in said block enters a groove, 5, made in the shipper-rod. A spring, d^2, connected at one end with the said block and at its other end with the frame-work at 6, normally keeps the rear end of the block D against the hub of the handle d^3, which is extended up through a slot in the bed-plate, the said slot being long enough transversely of the said plate to permit the said handle to move therein as the shipper-rod is oscillated in its bearings, as will be described, to throw its arm d^4 into the path of the dog *e*, as will be described, when the locking device, composed, as herein shown, of the slide-bar D^3, slotted and guided by pins D^4 D^4 in the flange B^4, (see Fig. 3,) is moved sufficiently far in the direction of the arrow on the said bar to release the hooked end 7 of the said slide-bar from the stopping-arm D^6, fast upon the shipper-rod, and having attached to it and the fixed pin *f* a strong spring, *f'*. The slide-bar D^3 is normally held with its end 7 pressed toward the arm D^6 by a spring, 12. The slide-bar has a stop, E, adjustably attached to it by screws 13. The slide-block D, in Figs. 1 and 3, is supposed to be in position to start the machine to enable the needle to descend through the material, a garment or other article placed between the presser-foot and button-holder, and with its outer or right face against a button held, with its back up, by the holder to enable the needle to stitch the said material and button together from what is to be the inner face of the garment or other article. The shaft A is provided with a face-cam, *g*, which, at each rotation of the said shaft and at each stitch, acts against a suitable stud, 16, on a lever, *g'*, having its fulcrum g^2 upon the under side of the bed-plate, the said stud being kept pressed against the said cam by a suitable spring, 17. The lever *g'* has attached to it a pawl, g^3, the engaging-hook of which is kept in contact with the ratchet-teeth 3 of the block D by a suitable spring, (shown at 18,) so that as the lever *g'* is vibrated the said pawl, by its action on the teeth of the block D, causes the latter to be moved forward on the shipper-rod one step for each stitch to be made. During the forward movement of the pawl g^3 its end rides upon the detent g^4, pivoted at g^5, and held in engagement with the teeth of the block D by a suitable spring, 19.

Preparatory to commencing to stitch a button the screw c^6 will be placed against the stitch-regulating plate *d* near its end, as in Fig. 3. At each stitch the pawl g^3 will move the block D forward one step, and by the time that two of the holes in the button have been stitched the plate *d* will pass beyond the screw c^6, and the screw c^5 will come against the flange B^4, and during such movement the button-holder will be moved longitudinally, as before stated. Farther movement of the block D in the same direction will cause it to strike the stop E and move the slide-bar D^3 in the direc-

tion of the arrow on it, Fig. 3, far enough to release the arm D^6 of the shipper-rod D', and as the said rod is turned or oscillated by the spring f' the cam or projection h will strike the short arm of the detent g^4 and release the block D, so that the spring d^2, referred to, will return it to its normal position against the hub of the handle d^3. The shipper-rod having been released by the movement of the locking device D^3, the spring f' will cause the inclined face 20 of the arm d^4 to be brought into position to be struck by the dog e, pivoted at e' on a block or shoulder, e^2, fast on the shaft A, so that the dog as it strikes against the said arm d^4 will be moved about its pivot and be drawn back out from engagement with the pin or projection h^2 on the band or fly wheel G loose on the shaft A, thus permitting the said wheel to run without moving the stitching parts. The dog is acted upon by a spring, e^4.

To arrest the movement of the shaft A positively, but yet not with a blow, it has been provided with a rather stiff spring, n, fastened at one end to the cam-hub A^4, while the other end, n', of the said spring projects far enough to strike the arm D^6 just after the dog e is moved to release the wheel G. When the shipper-rod was turned by the spring f', the block D was also turned or oscillated with it, owing to the pin 4 of the block which enters the groove 5, and as the cam h, acting upon the short arm of the detent, caused the long arm thereof to lift the pawl g^3 away from the teeth 3, the said block D was left free to be moved backward quickly by the spring d^2 until the block met the hub of the handle d^3. The oscillation of the shipper-rod by the spring f' places the arm D^6 in such position immediately behind the end 7 of the bar D^3, moved forward, as described, by the block D, as to prevent the said bar from being moved in the direction opposite the arrow thereon under the spring 12, until after the return of the block D^6 to its position, Fig. 3, which is done by oscillating the rod D' back into its position, Fig. 3, by the handle d^3. Movement of the handle d^3 in the direction of the arrow on its head (see Fig. 4) causes the rod D' to be oscillated to remove the arm d^4 from the path of the dog e, and also causes the arm D^6 to pass beyond the end 7 of the locking device D^3, and releases the hold of the cam h on the detent, and the stitch-regulating plate, by its action against the screw c^6, effects the movement of the button-holder into its normal position.

In order to surely draw the shuttle-thread up through the eye of the needle by the needle-thread t, and to avoid the formation of loose loops at the face of the button, I have added to the machine a clamping device, Fig. 1^a, made as a lever, pivoted at p' upon the overhanging arm A^6. The short arm of this lever is made to act upon the needle-thread extended under a pin or stud, p^2, fast to the arm A^6, and clamp and hold the same positively between the usual take-up lever, A^5, and the spool p^4, while the take-up is drawing up the loop of needle-thread, so that the needle-thread cannot possibly be delivered at such time from the spool p^4, but just before the take-up completes its backward movement the said thread-clamping device is moved to release the needle-thread and permit the take-up to draw from the spool enough thread for the next stitch. The lever p' is joined by rod p^5 with the lever p^6, acted upon by a pin, p^7, extended from one side of the usual eccentric, w, which actuates the link A^2.

I do not broadly claim a thread-clamp.

I claim—

1. In a sewing-machine, the combination of sewing mechanism, a button-holder, means to move it so as to successively present its several eyes or holes for the proper reception of the stitches, and a main driving-shaft from which motion is derived, with a shipper-rod and slide-block thereon, and means to move said block forward stitch by stitch, substantially as and for the purpose described.

2. In a sewing-machine, the combination of sewing mechanism, a button-holder, means to move it so as to successively present its several eyes or holes for the proper reception of the stitches, and a main driving-shaft from which motion is derived, with a shipper-rod and slide-block thereon provided with ratchet-teeth, a pawl, lever, and cam to move the pawl, substantially as and for the purpose described.

3. In a sewing-machine, the combination of sewing mechanism, a button-holder, means to move it so as to successively present its several eyes or holes for the proper reception of the stitches, and a main driving-shaft from which motion is derived, with a shipper-rod and slide-block thereon, means to move the slide-block on said rod step by step, and a locking device for said shipper-rod operated by the slide-block to release the shipper-rod, substantially as and for the purpose described.

4. The longitudinally-movable slide-block D and stitch-regulating plate d thereon, combined with the button-holder and with intermediate devices to effect the longitudinal movement of the button-holder at the predetermined time, substantially as described.

5. The button-holder, the lever m^4, to support its fulcrum, the slide-block, and its attached stitch-regulating plate d, combined with the lever c^3 and the adjusting-screws c^5 c^6, and with means to connect the said lever m^4 and c^3, substantially as described.

6. The combination of sewing mechanism, a button-holder, means to move it so as to successively present its several eyes or holes for the proper reception of the stitches, a main driving-shaft from which motion is derived, the shipper-rod, its arm D^6, a locking device to engage and hold the said arm, a stop connected therewith, and a sliding block to strike the said stop and effect the release of the locking device from said arm, substantially as described.

7. The combination of sewing mechanism,

a button-holder, means to move it so as to successively present its several eyes or holes for the proper reception of the stitches, a main driving-shaft from which motion is derived, the shipper-rod, its arms D^6 and d^4, and the shaft A, and the spring $n\ n'$, to strike the said arm D^6, substantially as described.

8. In a sewing-machine, the shaft A, the belt-pulley G, placed thereon loosely and provided with a pin or projection, and a dog pivoted upon the said shaft and adapted to engage the pin or projection of the said pulley, combined with a shipper-rod, a handle, d^3, and an arm, d^4, thereon, adapted to be placed in the path of the said dog by the movement of the oscillation of the shipper-rod, a button-holder, a slide-block on said rod, means to operate the same, and mechanism interposed between the slide-block and button-holder to operate the latter, substantially as described.

9. The combination of sewing mechanism comprising a bed, a button-holder, a head, m^2, pivoted to the machine-bed, and to which head the button-holder is pivoted, a main shaft, a shipper-rod, a slide-block thereon moved step by step by connection with the main shaft, and a system of levers and stops interposed between the said slide-block and head m^2 to operate the latter, substantially as and for the purpose described.

10. The combination of sewing mechanism, a button-holder, a main driving-shaft from which motion for the several parts is derived, the ordinary take-up, and a special thread-clamping device consisting of the stud p^2, needle-thread clamp p', link p^5, and lever p^6, all substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LAWRENCE J. DRISCOLL.

Witnesses:

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JOS. P. LIVERMORE.