(No Model.) 3 Sheets—Sheet 1.

J. J. SULLIVAN & H. D. BAKER.

BUTTON HOLE SEWING MACHINE.

No. 271,666. Patented Feb. 6, 1883.

Fig. 1

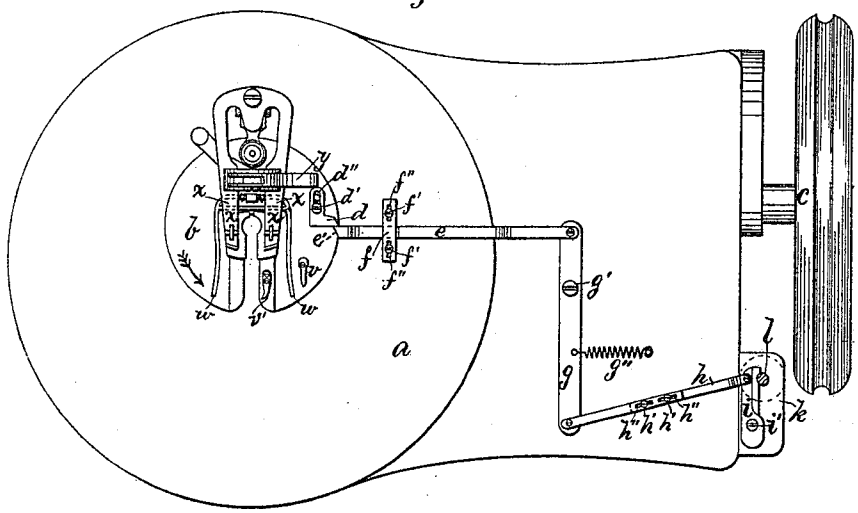
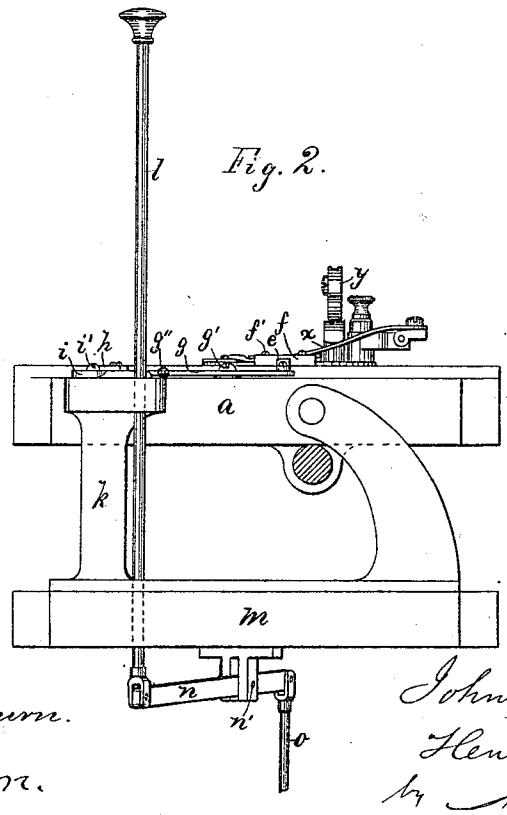


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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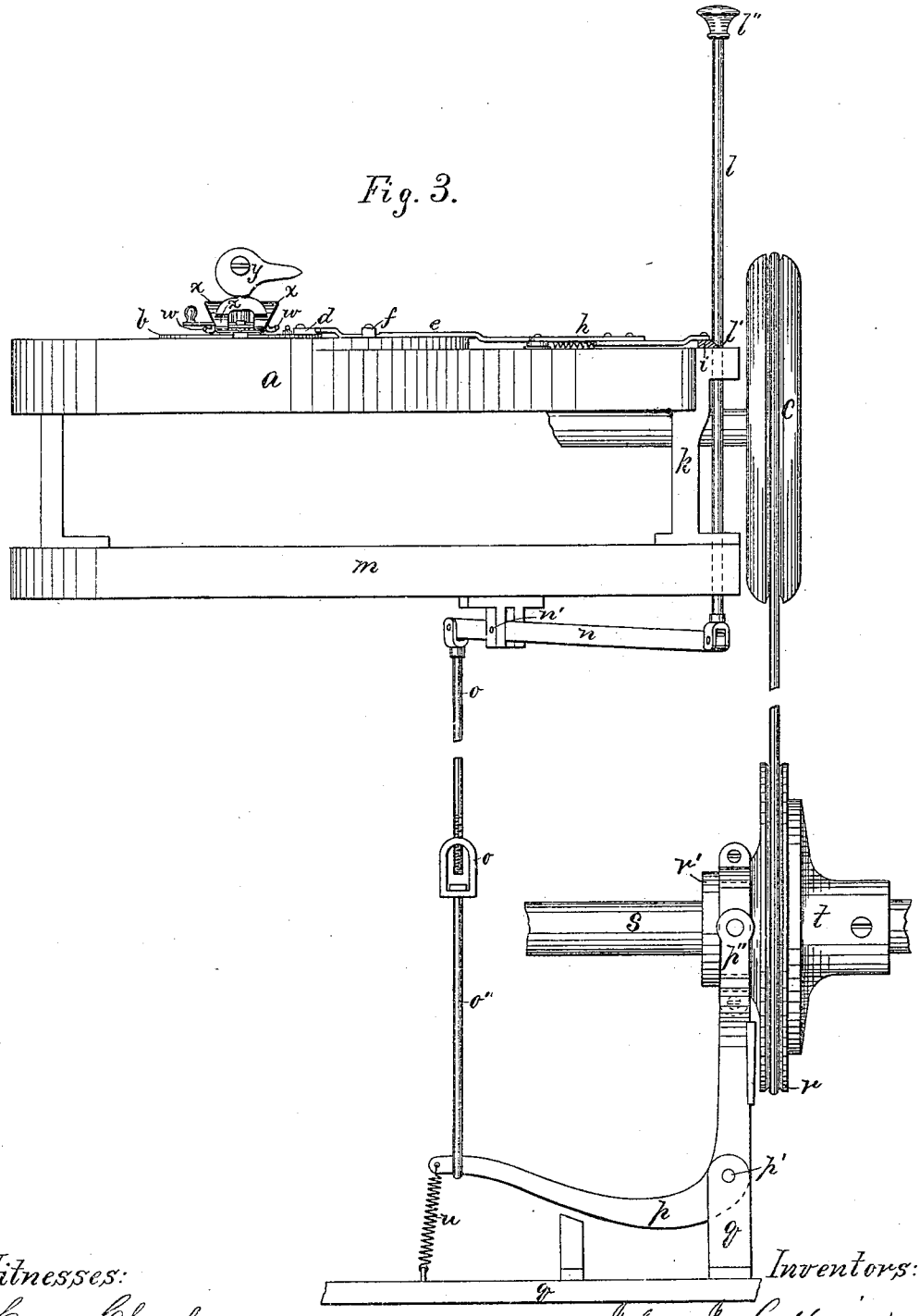
Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

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BUTTON HOLE SEWING MACHINE.

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Fig. 4.

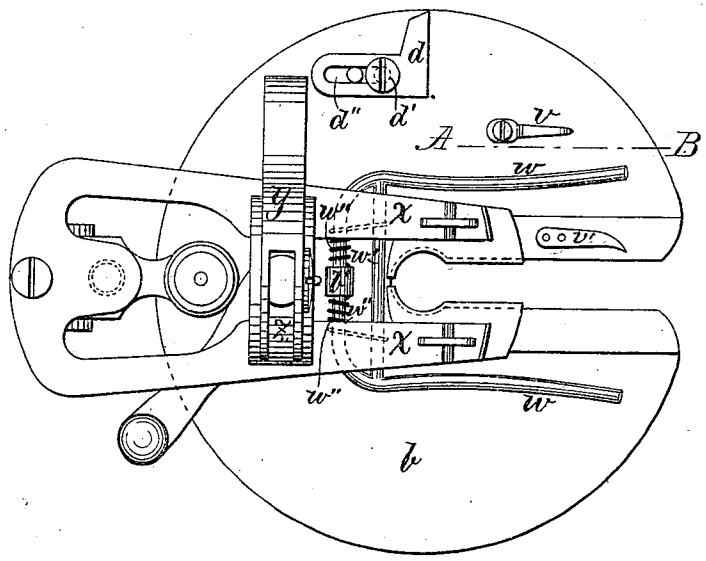
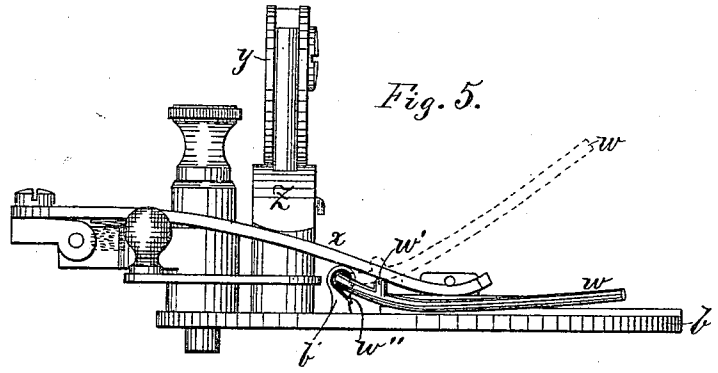


Fig. 6.

Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN J. SULLIVAN, OF IPSWICH, AND HENRY D. BAKER, OF LYNN, MASSACHUSETTS; SAID BAKER ASSIGNOR TO SAID SULLIVAN.

BUTTON-HOLE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 271,666, dated February 6, 1883.

Application filed May 6, 1880. (No model.)

To all whom it may concern:

Be it known that we, JOHN J. SULLIVAN, residing at Ipswich, in the county of Essex and State of Massachusetts, and HENRY D. BAKER, residing at Lynn, in the county of Essex and State of Massachusetts, both citizens of the United States, have jointly invented certain new and useful Improvements in Button-Hole Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to button-hole sewing-machines; and it consists in the construction and combination of the divers devices embodied therein, as hereinafter more particularly and fully set forth and claimed.

In the accompanying drawings, Figure 1 is a plan view of a button-hole sewing-machine as provided with our improved mechanism. Fig. 2 is an end view of the same, taken as viewed from the right in Fig. 1, and with the balance-wheel *c* removed, and with its arbor shown in transverse section. Fig. 3 is a front elevation of the same, and also of the lower or driving shaft, its pulley and clutch mechanism, and the connection thereof with the parts shown in Figs. 1 and 2. Fig. 4 is a top or plan view of the clamp with my improved guard thereto applied. Fig. 5 is a side elevation of the parts shown in Fig. 4. Fig. 6 is a detached vertical section, taken on line A B, Fig. 4.

In these views, *a* is the bed of an ordinary button-hole sewing-machine of that class in which the work is held and rotated between a rotary plate (shown at *b*) and securing-clamps (shown at *x x*) mounted on said plate, motion being imparted to the operative devices of the machine through the driving balance-wheel *c* in the usual well-known manner.

To the rotary work-supporting plate *b* is secured an adjustable projection or tripper, *d*, by means of set-screw *d'*, seated in elongated slot *d''* in the tripper and threaded in plate *b*.

A rod, *e*, having an oblique end face like that of the tripper, is secured to slide freely lineally in the bridge *f*, secured to bed *a* by screws *f'*, passing through slots *f''* and threaded in bed *a*. To the opposite end of rod *e* is pivoted one end of rocking lever *g*, that vibrates on pivot *g'*, and the opposite end of this lever is pivoted to rod *h*, the outer end of which is pivoted to pawl *i*, which is pivoted at *i'* to standard *k*, as shown. Said rod *h* is formed in two parts, which overlap each other, and are adjustably secured together by screws *h'*, which pass through slots *h'' h''* in one part and are threaded in the other, by which construction said rod may be lengthened or shortened to a limited but requisite extent.

A vertical shipper-rod, *l*, arranged to slide freely in bearings in standard *k* and bench *m*, is formed with a seat or notch, *l'*, which is engaged by catch *i* when the rod is depressed. The lower end of said rod is pivotally connected with lever *n*, which is mounted in stirrup *n'*, secured to and supported by bench *m*. To the opposite end of lever *n* is pivoted rod *o*, which is provided with a turn-buckle, *o'*, and a lower section, *o''*, which is connected with the turn-buckle at its upper end and with the horizontal arm of knee or angle lever *p* at its lower end, which lever is pivoted at *p'* in standard *q*, secured to the floor. The upper arm, *p''*, of lever *p* is jointed to the grooved extension *r'* of loose pulley *r*, as shown, said loose pulley being mounted on driving-shaft *s*, adjacent to friction-disk *t*, which is rigidly secured on said shaft by a set-screw, as shown in Fig. 3.

A spring, *w*, is at its respective ends connected with bracket *q'* and the horizontal arm of angle-lever *p*, and by its contractile force serves, through said lever, to disconnect loose pulley *r* from the driving disk or clutch *t* when shipper rod *l* is released, as will be described.

A helical spring, *g''*, is at its respective ends secured to bed *a* and the arm of lever *g* between pivot *g'* and rod *h*, and by its contractile force tends constantly to press bar *e* into contact with tripper *d*, and also to move pawl *i* into seat *l'* in shipper-rod *l*, when the same is depressed, to so hold it until released, as will be described.

The practical operation of the foregoing portion of our invention is as follows: Clamp-plate *b* being in the proper position for com-

mencing the stitching of a button-hole—that is, the reverse of the position shown in Fig. 1—so that tripper *d* is at the opposite side from *e'* of bar *e*, and the cloth or leather being confined in the clamp, as described, the machine will then be put in motion by depressing shipped rod *l*, as shown in Fig. 3, so as to force loose pulley *r''* into contact with driving-disk *r* through the agency of lever *n*, rod *o*, and angle-lever *p*, as already described, thereby rendering the machine operative by means of the belt connecting pulley *r''* with driving-wheel *c*, whereby the clamp will be rotated in the direction indicated by the arrow in Fig. 1 in the usual manner, and tripper *d* will, when the clamp is backing off for the stitching of the last side of the button-hole, be brought into contact with oblique end *e'* of bar *e*, and will at the moment when the button-hole is completed move said bar endwise, thereby rocking lever *g* on its pivot *g'*, and through rod *h* disconnecting pawl or catch *i* from seat or notch *l'* in lever *l*, which had been depressed, as before described, thereby allowing spring *u* to actuate lever *p*, and disconnect pulley *r'* from frame-disk *r*, thereby stopping the machine; and this manipulation and operation of the respective parts is repeated in connection with the stitching of each button-hole.

A forked guard, *w*, pivoted in block *b'*, secured to plate *b*, and strengthened by a bar, *w'*, which connects its two arms, is arranged to be depressed upon the cloth or leather at the same time that arms *x* are depressed thereon by the action of cam-lever *y*, which acts upon block *z*, which latter acts directly upon said arms *x*, and these latter, acting upon bar *w'*, force down the arms of guard *w*, as stated. The arms of this guard, arranged outside of arms *x* of the clamp, serve to depress and hold down that portion of the shoe-upper which is not engaged by the clamp, and which, by reason of the form of the upper when the "vamp" and "quarters" are "closed", (which is always done before stitching the button-hole,) causes the shoe-upper to curl in over the arms of the clamp and in the way of the needle, and thereby renders it liable to be engaged by the needle and injured during the operation of stitching the button-holes. When cam-lever *y* is actuated to release arms *x* of the clamp, the guard *w* is thrown upward by the action of helical springs *w''*, as shown in Fig. 5 by dotted lines.

A thread-cutter, *v*, is secured to clamp-plate *b*, as shown in Figs. 1, 4, 6, and a thread catch or holder, *v'*, is also secured to said plate between the needle-throat and said cutter, and, as said cutter and thread-holder travel with the clamp-plate and retain at all times their positions relatively to each other and to said plate, it is thereby rendered both practical and of great convenience at the completion of each button-hole for the operator to deflect the under thread and the cord which is employed to raise the purl and pass the same beneath catch *v'* at the same time that he passes them beneath and severs them by the cutting effect of blade *v*, the thread and cord being thus automatically held in position by catch *v'* for the commencement of the succeeding button-hole.

We desire to state that we make no claim to the clutch mechanism, which is shown as mounted upon shaft S, or to a knee-lever connected therewith for the purpose of engaging and disengaging the same, as any well-known clutch mechanism may be arranged to coact with our invention. Nor do we claim anything shown or described in Letters Patent No. 179,232 (reissued as No. 9,864) to J. J. Sullivan, or No. 190,948 to H. D. Baker, the present applicants. Our invention, in so far as it relates to the devices through and by which the action of the movable clamp is communicated to the clutch mechanism for disconnecting the same and stopping the machine being unlike that shown in either of said patents, and our claim for our present mechanism for the accomplishment of said purpose is confined to our specific devices. Besides, in said Baker's patent the clamp-plate requires a special construction, while our invention may be applied to any existing machine, as, in fact, could the devices shown in said patent to Sullivan; but the same were in their nature, number, arrangement, and combination unlike our present invention. Nor do we claim the combination of a thread-cutter with a sewing-machine as such, as we are aware that such combination is old, common, and well-known, as shown in Patents No. 138,412, issued to Leslie, and No. 187,365, issued to Doyle, our cutter being attached to the traveling clamp-plate and moving therewith, and around the needle and needle-throat, so as to be always in convenient position in relation thereto and the coacting threads. For the severing of such threads and the cord our claims are confined to a cutter so arranged and moving and coacting with the securing-catch, by which the lower thread and cord are held in position for commencing each button-hole after the threads have been severed at the completion of the preceding button-hole.

We claim as our invention—

1. The combination of the traveling clamp, provided with tripper *d*, rod *e*, arranged to be lineally actuated by said tripper, vibrating lever *g*, pivoted to said rod, rod *h*, pivoted to said lever and to pawl *i*, said pawl and a spring, *g''*, to return said devices to first position when liberated from the tripper, shipper *l*, arranged to be engaged and held by said pawl when depressed, levers *n* and *p*, connected by rod *o* and arranged to be actuated by said shipper, and a clutch mechanism arranged upon the driving-shaft, and to be rendered operative or inoperative through said lever *p*, substantially as specified.

2. In combination with the traveling clamp of a button-hole sewing-machine, a thread-

cutter attached to and moving with such clamp around the needle and its throat, substantially as specified.

3. In combination with the traveling clamp of a button-hole sewing-machine, a thread-cutter and a thread catch or holder, both arranged upon and traveling with said clamp, around the needle and its throat, substantially as specified.

4. In combination with the clamp of a button-hole sewing-machine, a guard, *w*, arranged to co-operate with such clamp and to confine and hold out of the path of the needle that portion of the shoe-upper which extends beyond the confining-jaws *x* of the clamp, substantially as specified.

In testimony whereof we have affixed our signatures in presence of two witnesses.

JOHN J. SULLIVAN.
HENRY D. BAKER.

Witnesses:
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HENRY CHADBOURN.