

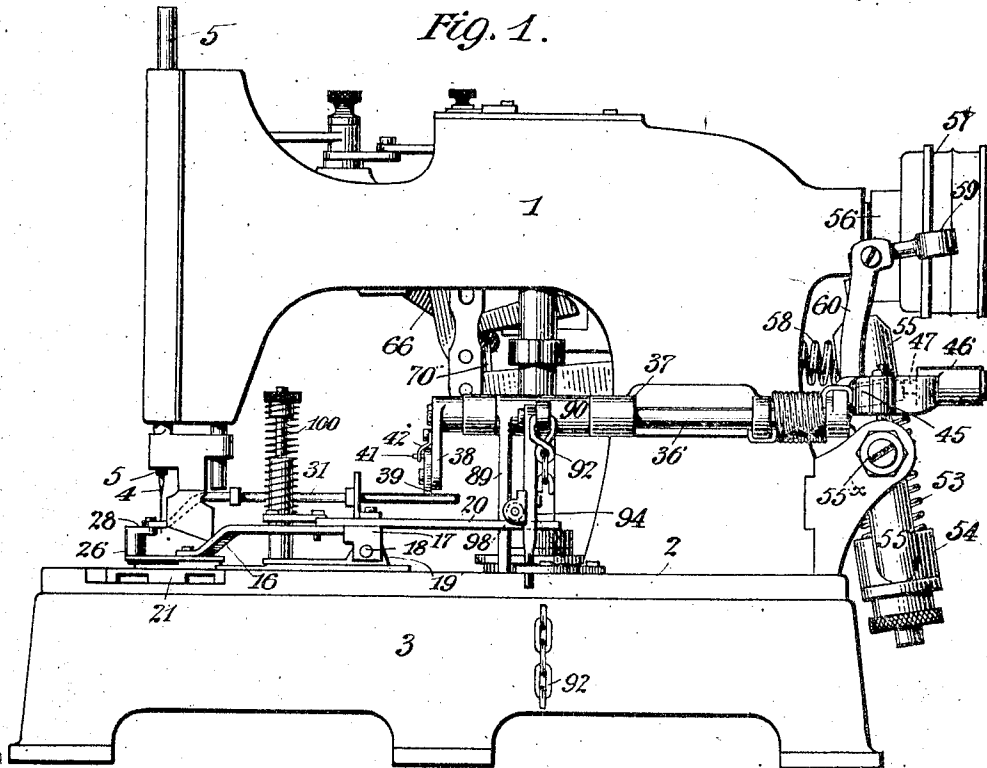
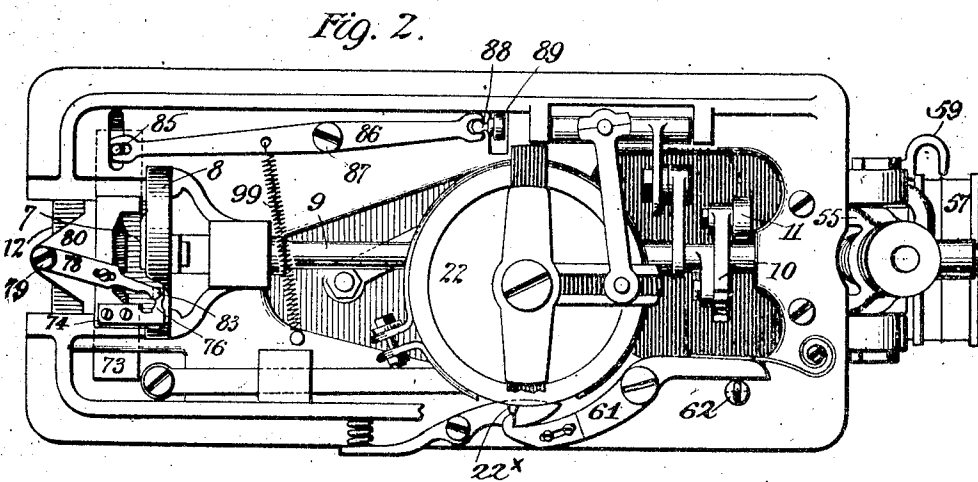
No. 885,310.

PATENTED APR. 21, 1908.

E. B. ALLEN.
THREAD CUTTING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED NOV. 23, 1905.

4 SHEETS—SHEET 1.



Witnesses
Paul S. Osin
W. K. Romann

Inventor
Edward B. Allen
By his Attorney
Harry J. Miller

No. 885,310.

PATENTED APR. 21, 1908.

E. B. ALLEN.

THREAD CUTTING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED NOV. 23, 1905.

4 SHEETS—SHEET 2.

Fig. 3.

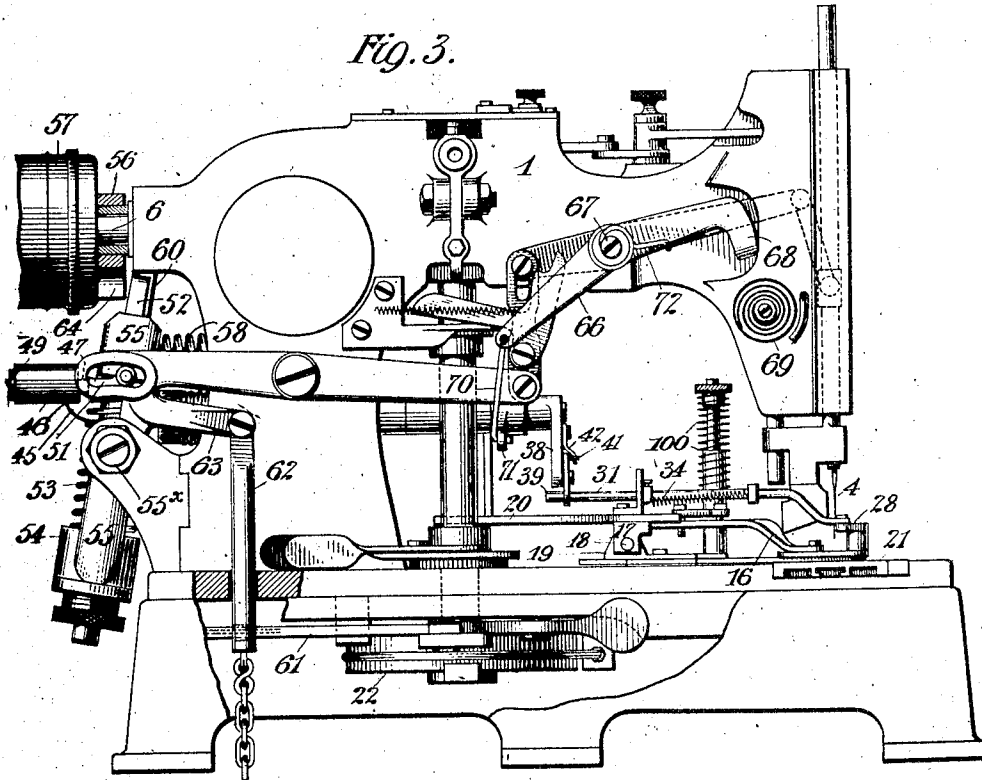
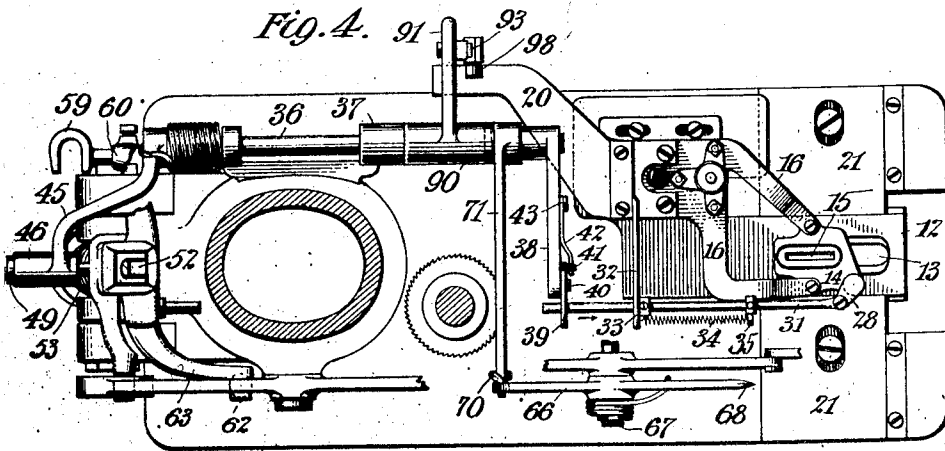


Fig. 4.



Witnesses
Paul S. Olsen
H. S. Minnaman.

Inventor
Edward B. Allen
By his Attorney
Harry J. Miller

No. 885,310.

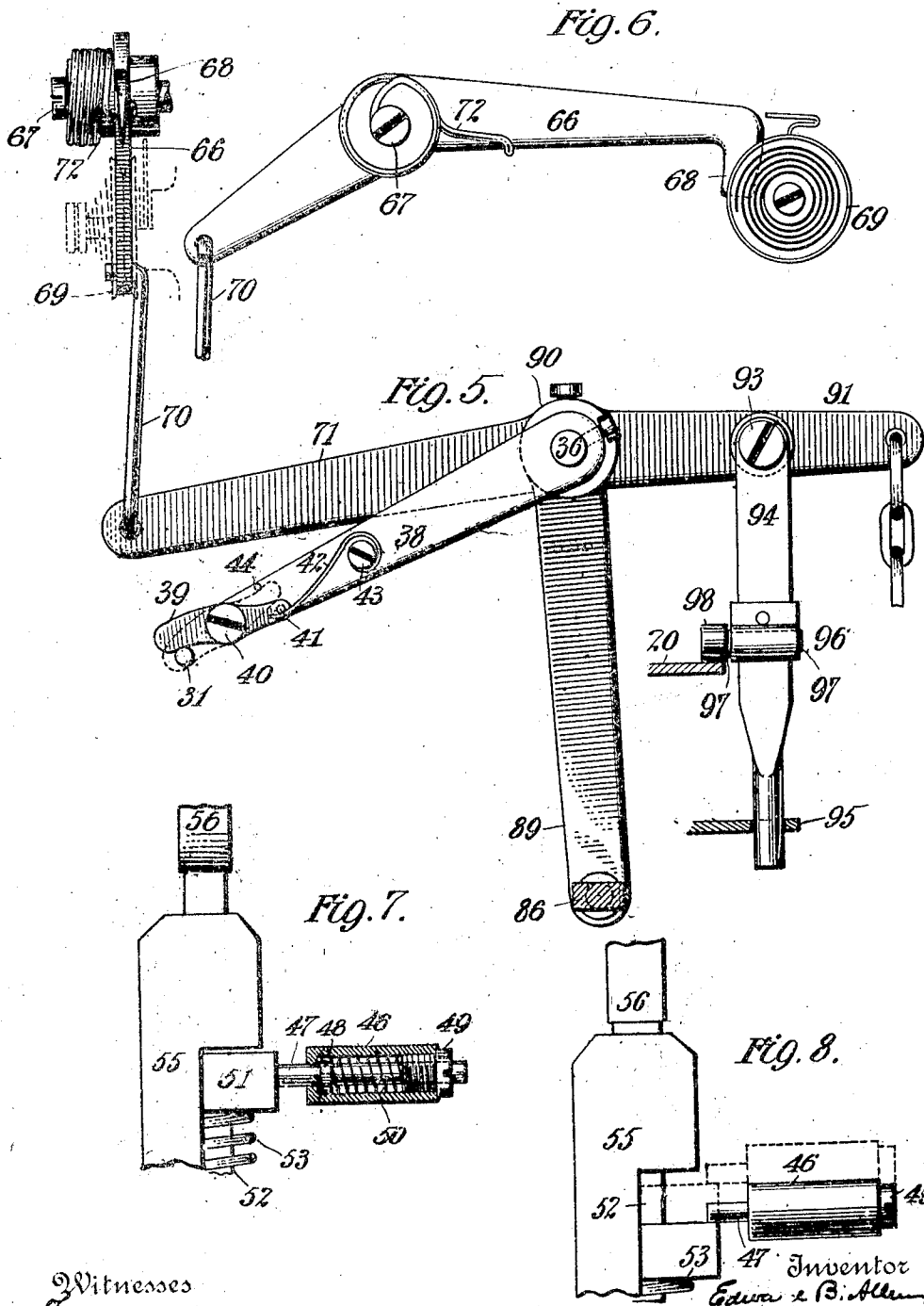
PATENTED APR. 21, 1908.

E. B. ALLEN.

THREAD CUTTING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED NOV. 23, 1905.

4 SHEETS—SHEET 3.



2 Witnesses
James S. Ober
Haskinsmann.

53 47 Inventor
Edwa & B. Allen
By his Attorney
Henry J. Miller

No. 885,310.

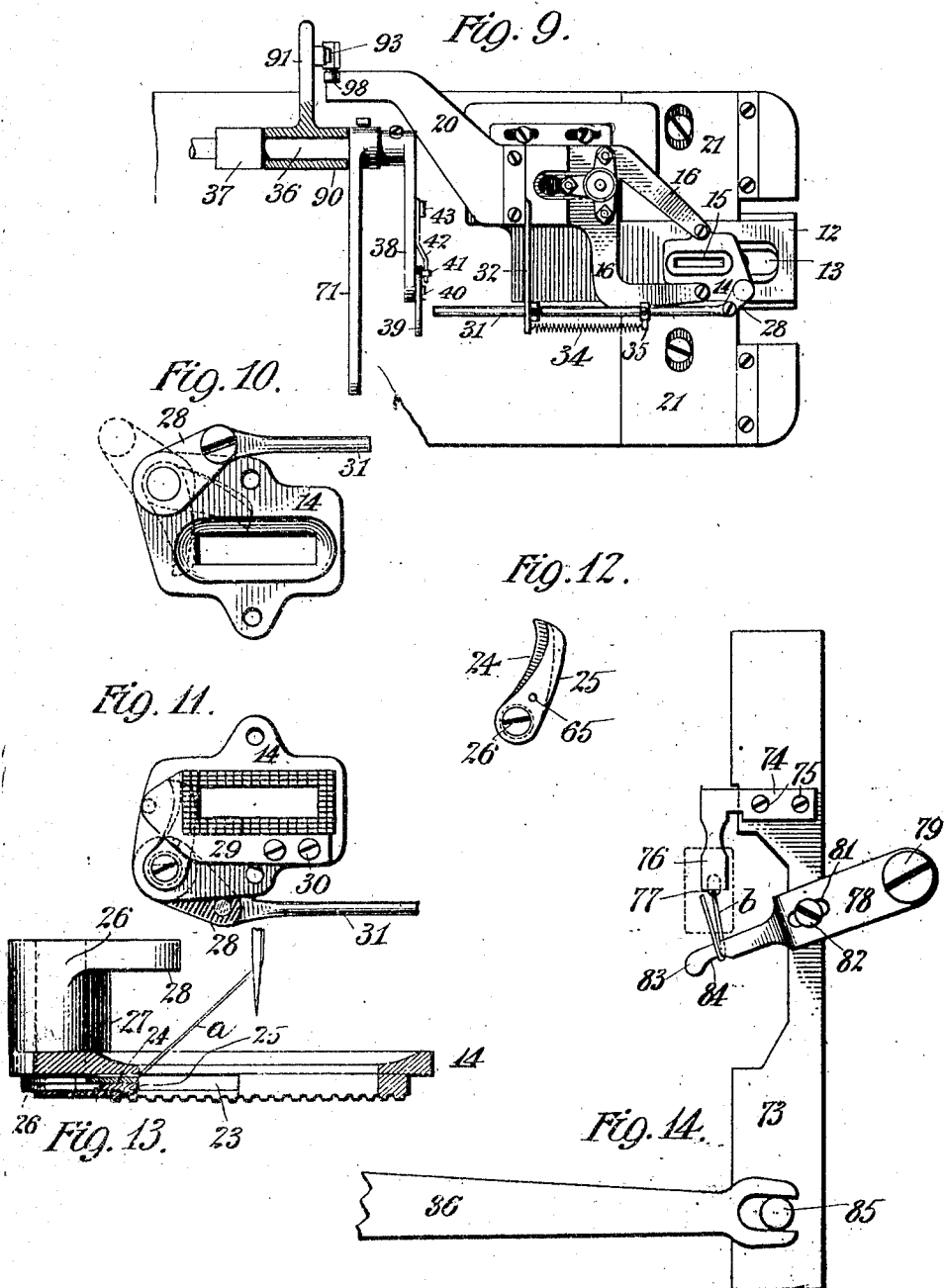
PATENTED APR. 21, 1908.

E. B. ALLEN.

THREAD CUTTING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED NOV. 23, 1905.

4 SHEETS—SHEET 4.



Witnesses
Charles C. Allen
W. Konemann

Inventor
Edward B. Allen
 By his Attorney *Amey J. Miller*

UNITED STATES PATENT OFFICE.

EDWARD B. ALLEN, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

THREAD-CUTTING MECHANISM FOR SEWING-MACHINES.

No. 885,310.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed November 23, 1905. Serial No. 288,647.

To all whom it may concern:

Be it known that I, EDWARD B. ALLEN, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Thread-Cutting Mechanism for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to means for cutting the threads in that class of sewing machines, and particularly those provided with stitch-forming mechanism employing upper and lower threads, which are adapted to produce groups of stitches; and it has for its primary object to provide cutting mechanism for both upper and lower threads which shall operate in such manner as to avoid leaving the cut thread end or ends upon the face or upper surface of the work.

It has for its further object to provide special means for cutting the needle thread above the work.

To this end, the invention, in its preferred form, comprises independently operable upper and lower thread-cutting mechanisms, of which the former is automatically actuated at the end of each stitching operation and the latter manually operated thereafter, whereby the shuttle thread remaining taut after the severing of the needle thread will tend to draw the cut end of the latter downward below the upper face of the material, while the provision of a lower thread pull-off acting in conjunction with and in advance of the cutter for severing the lower thread positively insures the drawing down beneath the material of the cut end of upper thread.

The invention further includes a work-clamp carrying thread-cutting and nipping members and controlled in its operation by a spring which is compressed by the feeding movement of the work-clamp in the formation of a group of stitches and controlled by a species of escapement actuated by a connection through the stop-motion device with a cycle cam connected with the stitch-forming mechanism.

The invention will be understood by reference to the annexed drawings, in which

Figure 1 is an elevation of one side of a buttonhole sewing machine embodying the present improvements, and Fig. 2 a bottom view of the same; Fig. 3 an elevation of the

opposite side of the machine from Fig. 1 with a portion of the bed-plate and base by which the same is supported broken away to expose certain parts inclosed therein; and Fig. 4 a plan of the machine with the upper portion of the bracket-arm and parts carried thereby removed. Fig. 5 is an elevation upon an enlarged scale of the tripping device for the upper thread-cutter and the tension release, and Fig. 6 a side view of the tension release. Figs. 7 and 8 are detail views showing portions of the connections between the upper thread-cutting mechanism and the stop-motion device. Fig. 9 is a plan of the forward portion of the bed-plate and the upper thread-cutting mechanism in a different position from that represented in Fig. 4. Fig. 10 is a top view and Fig. 11 a bottom view of the upper clamping member of the work-holder showing the thread-cutting and nipping devices applied thereto, and Fig. 12 is a detail view of the upper thread-cutting and nipping blades. Fig. 13 is a detail sectional view of the upper work-clamp member and needle with the cut end of the needle thread held by the thread-nipping blade. Fig. 14 is a detail bottom view upon an enlarged scale of the lower thread-cutter and pull-off.

The present improvements are shown embodied in a straight buttonhole machine of the well-known "Singer" type, such as that represented in the U. S. patent granted to me December 5, 1905, No. 806,231, and is provided with the usual bracket-arm 1 rising from the rear end of the bed-plate 2 supported by the base 3.

As represented herein the stitch-forming mechanism comprises the usual eye-pointed needle 4 carried by the needle-bar 5 mounted in the usual horizontally swinging frame and deriving its vertical reciprocating movements from the main shaft 6 mounted in the horizontal portion of the bracket-arm 1. The needle coöperates with a shuttle carrying the under thread-case 7 and mounted in a race-way 8 to receive oscillating movements from the rock-shaft 9 having connections through the rocker 10 and link 11 with the main shaft, in a manner well-known. The work-carrier is formed with a lower member consisting of the longitudinally-movable slide-plate 12 having an elongated opening 13 surrounding the needle-throat, and an upper jaw or clamping foot 14 similarly provided with an elongated needle-opening 15 and carried by

means of a pair of spring arms 16 secured to a block 17 pivotally mounted by means of a horizontal pin 18 upon a hinge-block 19 fixed upon a lateral extension of the slide-plate 12.

5 The carrier comprising the arm 16 and block 17 is provided with a backwardly extending operating lever 20 by which the foot 14 may be raised for introduction and removal of the work, but is adapted to close upon the lower
10 clamp member under the action of its spring 100 upon the release of the lever 20. The member 22 is herein termed a cycle-cam as its function is to effect the relative feeding move-
15 ments between the stitch-forming mechanism and the work holder and to initiate and control the timing of operation of certain other parts of the machine. The longitudi-
20 nal slide-plate 12 is mounted in suitable guide-ways in the transverse slide-plate 21, and each of such plates is provided with the usual connections with the feed-cam 22 from which their respective longitudinal feeding and lateral shifting movements are derived.

As represented particularly in Figs. 10, 11, 25 12 and 13, the upper clamp member 14 is provided intermediate and parallel with its upper and lower faces with a slot 23 to receive the separate thread-clamping and nipping blades 24 and 25 mounted upon the lower end
30 of the vertical shaft 26 provided above the member 14 with a fixed collar 27 having the crank-arm 28. For convenience in the insertion and removal of the cutting and nipping blades, the lower side of the foot 14 is
35 provided with a detachable portion 29 secured thereto by means of screws 30.

The crank arm 28 is connected with one end of a rod 31 disposed in the direction of longitudinal movement of the work-holder
40 and supported intermediate its ends by the rigid arm 32 which serves in conjunction with the fixed collar 33 upon the rod 31 as a stop to limit the endwise motion of the rod under the action of the spring 34 connected
45 at one end with the arm 32 and at the other end with a pin upon another fixed collar 35 upon the rod 31. To produce the necessary endwise movements of the rod 31 for actu-
50 ating the nipping and cutting blades 24 and 25, a longitudinal rock-shaft 36 is mounted in bearings provided therefor in a bracket 37 secured upon the bracket-arm 1, said rock-
55 shaft having fixed to its forward end a lateral arm 38 carrying at its outer end a latch-plate 39 pivotally mounted thereon by means of a
60 screw pin 40 which carries a lateral pin 41 engaged by the free end of a spring 42 having its fixed end attached to the arm 38 by means of a screw 43, whereby the inner end
of the latch-plate 39 is yieldingly pressed against a lateral stop-pin 44 upon the arm 38 and the latch-plate is normally maintained in line with its carrying arm and with the rod 31.

The rear end of the rock-shaft 36 is pro-
65 vided with a lateral arm 45 provided with

a cylindrical socket 46 which carries a longi-
tudinally-movable pin 47 with collar 48 in-
termediate its ends and between which and
the inner end of a perforated screw-plug 49
at the rearward end of the socket 46 is inter-
posed a spring 50 for yieldingly maintaining
the pin 47 in its forward position for engage-
ment with the top of a collar 51 fixed upon
the stop-motion plunger rod 52 surrounded
by a spring 53 interposed between said collar
51 and a bearing 54 for the plunger rod in the
75 slotted vibrating stop-motion lever 55 mount-
ed upon the center screws 55*, whereby the
plunger rod is pressed normally upward for
operative engagement with the stop-motion
80 cam 56 mounted upon the hub of and having
the usual yielding connection with the fixed
pulley 57 upon the main-shaft 6, the stop-
motion device herein represented being that
of my prior United States patents No. 85
767,539, of August 16, 1904, and No. 806,231,
of December 5, 1905.

When the stop-motion lever 55 is tilted for-
wardly in opposition to its actuating spring
58, as represented in the drawings, the upper
90 end of the plunger rod 52 is drawn out of
the path of movement of the cam 56 and its
fixed collar 51 is withdrawn from contact with
the pin 47, and the mechanism is adjusted
for the stitching operation, the belt-guiding
95 finger 59 carried by an upwardly-projecting
arm 60 of the lever 55 maintaining the belt
upon the fixed pulley 57 for such purpose. In
the running position of the parts correspond-
ing with such position of the stop-motion
100 lever, the arm 38 is extended toward the
axial line of the rod 31 and its latch-plate 39
rests yieldingly against such rod by which it
is temporarily displaced from its normal
position, represented in dotted lines in Fig. 5.
105 As the work-clamp moves forwardly with the
normal feeding movement communicated to
it by the feed-cam 22, the rod 31 is carried
with it and its end passes the latch-plate 39
which is thereby enabled to drop in behind
110 it under the action of the spring 42. In the
return feed-movement of the work-clamp to
initial position for the stitching of the second
side of the button-hole, the rod 31 is detained
by the latch-plate 39, while the cutter shaft
115 26 continues its travel with the clamp mem-
ber 14 whereby the angular relation of the
crank-arm 28 and rod 31 is gradually changed
and thus causes the cutting and nipping
blades 24 and 25 to be slowly retracted from
120 their operative transverse position at the end
of the needle-opening 15 (Fig. 11), and to
assume their inoperative position at the side
of the needle-opening 15, represented in
dotted lines in Fig. 10, the spring 34 being
125 thereby placed under increased tension for
subsequent performance of its primary func-
tion.

When the latch-lever 61 is shifted by actua-
tion of its tripping lug 22* carried by the 130

feed-cam 22, and such latch-lever withdraws from its notch in the treadle rod 62 connected with the lateral arm 63 of the stop-motion lever 55, the latter is tilted backwardly to bring the upper end of the plunger rod 52 into operative engagement with the lower portion of the stop-cam 56, the continued rotation of which causes its higher portion to force downwardly the plunger rod 52 in performance of its usual braking action and to finally spring upwardly again into the stop-notch 64 to bring the main shaft to rest. The lateral movement of the plunger rod 52 produced by the throw of the lever 55 brings the collar 51 into engagement with the yielding pin 47, as represented in Fig. 7, and the subsequent descent of the plunger rod carries downwardly the collar 51 and permits the pin 47 to spring forward over the same and to be thrust upwardly thereby, as indicated in Fig. 8, whereby the shaft 36 is rocked through its crank-arm 45 and causes the arm 38 with the latch-plate 39 to be thrown out of line with the rod 31 and the latter is permitted to move backwardly under the action of its spring 34 to oscillate the cutter shaft 26 in producing the operative movement of the nipping and cutting blades 24 and 25 across the end of the needle-opening 15 through which the needle thread *a* extends from the work to the needle-eye, thereby first nipping the needle thread between the upper edge of the slot 23 and the blunt-edged nipping blade 24 and then shearing off the lower portion of the needle-thread between the blade 25 and the preferably beveled lower edge of the slot 23, as represented in Fig. 13.

In order to produce the successive nipping and shearing actions upon the needle thread above described, it will be observed that the operative edge of the nipping blade 24 is set slightly in advance of that of the cutting blade 25, as indicated in Fig. 12, such relative positions being maintained by means of a steady-pin 65 carried by the one entering a suitable aperture or recess in the other. These blades are preferably made separate to facilitate grinding. In the relation of the parts represented herein, it is of great importance that these blades be detachable, as the level of the cutting edge of the blade 25 is backwardly and toward the blade 24, as represented in Fig. 13. In practice, the edge of the slot 23 cooperating with the operative edge of the knife 25 is formed as an acute angle to enable it to act as a member of a pair of shears of which the movable blade 25 constitutes the other member.

To prevent any tendency of the needle thread to pull out of the nipping device above described, it is desirable that the tension should be released just prior to the cutting operation, and this is produced by the action of the rock-lever 66 pivoted by means of a

screw 67 upon the bracket-arm 1 and having at one end a wedge-shaped lateral extension 68 adapted to enter between and separate the usual tension disks 69 (Fig. 6) and connected at its opposite end by means of a link 70 with a lateral arm 71 fixed upon the rock-shaft 36, and therefore movable simultaneously with the arm 38 serving as an escape-ment for the cutter-actuating rod 31. The lever 66 is provided with a suitable spring 72 tending to yieldingly maintain it in its normally inoperative position, as indicated in Fig. 3.

The under-thread pull-off and cutter comprises a slide-bar 73 mounted in suitable transverse guide-ways upon the under side of the bed-plate 2 and herein shown provided with an L-shaped spring-blade whose shank or stem 74 is attached to the bar 73 by means of screws 75 and whose operative portion 76 is curved upwardly and formed with a knife edge adapted to contact yieldingly with the under side of the needle-throat of which the farther side of the needle-hole 77 forms with the same a cooperating member in conjunction with which the knife acts in shearing off the lower thread *b* close to the material, as indicated in Fig. 14. The shank 78 of the pull-off lever is pivoted by means of a fulcrum screw 79 to a fixed bracket 80 beneath the bed-plate and is provided intermediate its ends with a slot 81 entered by the shank of a screw 82 carried by the slide-bar 73. The contracted operative portion 83 of the pull-off lever is rounded upon its outer extremity and provided in its edge with a recess 84 for engagement with the lower thread leading from the thread-case to the needle-hole 77. The slide-bar has at one end of its lower side a stud 85 embraced by the forked forward end of a lever 86 mounted upon a fulcrum screw 87 and having its opposite end also forked to embrace the spherical head of a lateral stud 88 carried by the lower end of an arm 89 depending from a sleeve 90 loosely mounted upon the rock-shaft 36 and carrying also a lateral arm 91 to which is attached a chain 92 which may be connected with a foot- or knee-lever within the convenient reach of the operator in charge of the machine.

To the arm 91 is pivotally connected by means of a screw 93 a depending rod 94 whose lower end portion is fitted to and guided within a suitable aperture in a guide-plate 95 secured to the bed-plate 2. The rod 94 is provided with a bearing piece 96 carrying a stud 97 upon one end of which is secured a roller 98 normally resting upon or close to the top of the operating lever 20 of the work-clamp.

When the chain 92 is drawn downwardly to depress the arm 91, and hence the clamp-lever 20, through the rod 94 for opening the clamp in opposition to its spring 100, the de-

pending arm 89 is simultaneously shifted laterally to vibrate the lever 86 in opposition to its retaining spring 99, and the slide-bar 73 is thereby given transverse shifting movements. As the screw 82 engages the pull-off lever intermediate its ends, it is evident that the latter receives a longer stroke than the knife-blade 76, and as the operative portion 84 of such pull-off lever is normally adjacent the portion 76 of the cutting knife, it will be seen that the pull-off lever is caused to act upon the lower thread considerably in advance of the knife, so as to draw off the requisite length of such thread from the thread-case before the operative edge of the knife has advanced to cutting position, as represented in Fig. 14, from which it will be observed that the opening of the clamp to remove the work causes the successive pulling off and cutting of the under thread.

Mechanisms have heretofore been devised for cutting practically at the same time the upper and under threads of a multiple-thread sewing machine, but such devices have been to a certain extent ineffective in that no provision has been made for drawing the cut end of the upper thread downward beneath the work. By first cutting the upper thread and then allowing an interval of time in which the elasticity of the taut lower thread may act in drawing downwardly the cut end of upper thread, a tendency is created for the correction of this defect, while the addition of a positive under thread pull-off device acting subsequently to the cutting of the upper thread and prior to the action of the lower thread-cutter insures the withdrawal of the cut thread end from the face of the material.

While the means for successively actuating the upper and lower thread severing mechanisms herein shown and described are considered to be the preferable embodiment of the present improvement, it is evidently immaterial to the essence of the invention whether both upper and lower thread severing mechanisms be actuated automatically or both manually, or the one automatically and the other manually, or whether such mechanisms be actuated even by independent means, so long as the one is actuated in advance of the other to enable the unsevered thread to draw either partially or wholly beneath or through the work the end of the previously severed thread prior to the severing of such theretofore unsevered thread.

In the employment of an automatically-acting cutting device for the lower thread, especially in connection with a pull-off device, the sudden pull upon the lower thread necessary in the quick action of the mechanism has produced an objectionable "spilling" of the lower thread from its bobbin, which is entirely obviated by the manually-operated device herein shown and described. There-

fore, the present improvement adapts the machine for quickly and effectively cutting the upper thread at the end of each stitching operation while offering every advantage with absolutely no unnecessary loss of time in severing the lower thread in the most advantageous manner.

While the present improvement is shown herein applied to a buttonhole sewing machine of the class described, it is evidently well adapted for incorporation in other classes of sewing machines with equal advantage, and the present invention is not therefore to be understood as limited to the particular embodiment and details of construction herein shown and described.

Having thus set forth the nature of the invention, what I claim herein is,—

1. In a sewing machine comprising sewing instrumentalities, needle and looper thread severing devices located respectively on opposite sides of the work, means for operating said severing devices whereby one of the threads may be severed before the other while the work is in its normal position to be stitched in the machine, and whereby in the interval between the severing operations the unsevered thread may operate to draw the end of the severed thread through the face of the work upon the side on which it was severed.

2. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper thread mechanism and under thread mechanism, a stop-motion device for controlling the operation of said stitch-forming devices and a cycle cam for controlling the operation of said stop-motion device, of independent upper and lower thread severing devices having their thread-engaging members spaced to admit the work between them and thus disposed at opposite sides of the work, automatically-acting means for actuating the upper thread severing device at the end of a stitching operation, and manually-operated means whereby the lower thread severing device may be actuated after the stitch-forming mechanism comes to rest and after the upper thread is severed.

3. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper thread mechanism and under thread mechanism, a self-closing work-clamp and manually-controlled means for opening the same, a stop-motion device for controlling the operation of said stitch-forming devices and a cycle cam for controlling the operation of said stop motion device, of independent upper and lower thread severing devices, automatically-acting means for actuating the upper thread severing device at the end of a stitching operation, and a connection between said work-clamp and said lower-thread severing device

whereby a single manual actuation of the same effects the opening of said clamp and the operation of the lower-thread severing device to sever the lower-thread, and the release of the same permits said parts to automatically return to initial position.

4. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper thread mechanism and under thread mechanism, a stop-motion device for controlling the operation of said stitch-forming devices and a cycle cam for controlling the operation of said stop-motion device, of independent upper and lower thread severing devices having their thread-engaging members spaced to admit the work between them and thus disposed at opposite sides of the work, a connection between said upper thread severing device and the stop-motion device whereby the operation of the latter in arresting the stitch-forming devices causes the operation of said upper thread severing device to sever the upper thread, and manually-operated means whereby the lower thread severing device may be actuated after the stitch-forming mechanism comes to rest.

5. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper thread mechanism and under thread mechanism, a stop-motion device for controlling the operation of said stitch-forming devices and a cycle-cam for controlling the operation of said stop-motion devices, of independent upper and lower thread severing devices, a lower thread pull-off, automatically-acting means for actuating the upper thread severing device at the end of a stitching operation, and manually-operated means whereby said pull-off and lower thread severing devices may be actuated after the severing of the upper thread to successively pull off and sever the lower thread.

6. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper thread mechanism and under thread mechanism, a work-clamp relatively movable in respect of said stitch-forming devices, a stop-motion device for controlling the operation of said stitch-forming devices and a cycle-cam for controlling the operation of said stop-motion device and for communicating relative feeding movements between said work-clamp and stitch-forming devices, of an upper thread severing device carried by said work-clamp and provided with spring-pressed actuating means, and a lower thread severing device, a rock-shaft deriving rocking movements from the stop-motion mechanism and provided with a lateral arm adapted to cooperate with the actuating means of the upper thread severing device in the compression of its spring and to release the same to enable it to perform

its normal function, a sleeve mounted loosely upon said rock-shaft and having two arms one of which is operatively connected with the work-clamp for opening the same and the other is provided with a positive connection with said lower thread severing device, and means for rocking said sleeve to open the work-clamp and sever the lower thread after the upper thread has been automatically severed through its connection with the stop-motion device.

7. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper thread mechanism and under thread mechanism, a work-clamp relatively movable in respect of said stitch-forming devices, a stop-motion device for controlling the operation of said stitch-forming devices and a cycle-cam for controlling the operation of said stop-motion device and for communicating relative feeding movements between said work-clamp and stitch-forming devices, of an upper thread nipping and severing device carried by said work-clamp at the portion thereof through which the stitch-forming devices initially operate, and actuating means therefor comprising an operating member also carried by said work-clamp, a lower thread severing device mounted in fixed relation to said stitch-forming devices, automatically-acting means for controlling the upper thread actuating means to release the upper-thread-end after a material relative movement of the work-clamp and stitch-forming devices from initial starting position and to again successively nip and sever the upper thread upon the return of such relatively moving parts to initial position at the end of the stitch-forming operation, and manually-operated means whereby the lower thread-severing device may be actuated after the nipping and severing of the needle-thread.

8. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper thread mechanism and complementary stitch-forming mechanism, a work-clamp relatively movable in respect of said stitch-forming devices, and a cycle-cam for communicating the relative feeding movements between said work-clamp and stitch-forming devices, of a thread severing device carried by said work-clamp, actuating means therefor comprising a spring-pressed reciprocating rod also carried by said work-clamp, a stop-member disposed normally in the path of endwise movement of said spring-pressed rod for arresting the movement of the same in the travel of said work-clamp for causing it to throw the thread-nipping and cutting device into inoperative position, and means intermediate said stop-member and cycle-cam whereby said stop-member is disengaged at the end of a stitch-forming operation from said spring-

pressed rod and the latter is thereby permitted to return to initial relation and thereby cause the nipping and severing of the upper thread.

5 9. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper thread mechanism and complementary stitch-forming mechanism, a work-clamp relatively movable in respect of said stitch-forming devices, and a cycle-cam for communicating the relative feeding movements between said work-clamp and stitch-forming devices, of a thread-severing device carried by said work-clamp, 10 actuating means therefor comprising a spring-pressed reciprocating rod also carried by said work-clamp, a rock-shaft and operative connections between the same and said cycle-cam whereby the latter is rocked at the completion of a stitch-forming cycle, and a lateral arm upon said rock-shaft provided with a movably-mounted latch-plate adapted to serve normally as a stop for said spring-pressed rod, whereby the movement of the clamp in respect of said lateral arm causes the detention of said rod by the latch-plate to effect the opening of the thread nipping and severing device, while the subsequent actuation of the rock-shaft causes the movement of its said lateral arm to release the spring-pressed rod and permit the same to return the nipping and cutting device to initial operative position for engagement with the thread.

35 10. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper thread mechanism and complementary stitch-forming mechanism, a work-clamp relatively movable in respect of said stitch-forming devices, and a cycle-cam for communicating the relative feeding movements between said work-clamp and stitch-forming devices, of a thread severing device carried by said work-clamp, actuating means therefor comprising a spring-pressed reciprocating rod also carried by said work-clamp, a rock-shaft and operative connection between the same and said cycle-cam whereby the latter is rocked at the completion of a stitch-forming cycle, and a lateral arm upon said rock-shaft provided with a pivotally-mounted spring-pressed latch-plate adapted to serve normally as a stop for said spring-pressed rod, whereby the movement of the clamp in respect of said lateral arm causes the detention of said rod by the latch-plate to effect the opening of the thread nipping and severing device, while the subsequent actuation of the rock-shaft causes the movement of its said lateral arm to release the spring-pressed rod and permit the same to return the nipping and cutting device to initial operative position for engagement with the thread.

65 11. In a sewing machine for forming groups

of stitches, the combination with stitch-forming devices comprising upper thread mechanism and complementary stitch-forming mechanism, a work-clamp relatively movable in respect of said stitch-forming devices, the upper member of said clamp being provided with a needle-opening and with a transverse slot parallel with the operative face of the same, and a cycle-cam for communicating the relative feeding movements between said work-clamp and stitch-forming devices, of a thread nipping and severing device comprising overlapping thread nipping and severing blades, the operative edge of the former being disposed in advance of that of the latter, a vertical rock-shaft mounted upon said work-clamp member and having said blades fixed upon its lower end within said transverse slot and a crank-arm upon its upper end, a spring-pressed reciprocating rod connected with the crank arm of said shaft and supported upon said upper clamp-member, a stop-member disposed normally in the path of endwise movement with the work-clamp of the spring-pressed rod for arresting the movement of the latter in the traverse of said work-clamp for causing it to throw the thread nipping and cutting blades backwardly into inoperative position, and means intermediate said stop-member and cycle-cam whereby said stop-member is disengaged at the end of the stitch-forming operation from said spring-pressed rod and the latter is thereby permitted to return to initial relation and to cause the nipping and severing of the thread by action of said nipping and cutting blades in conjunction with the respective adjacent edges of the transverse slot in the upper work-clamp member in which they are disposed.

105 12. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper-thread mechanism and under-thread mechanism, of an upper-thread severing device and an under-thread severing device having its thread-engaging portion spaced from that of the upper-thread severing device to admit the work between them and thus disposed at the opposite side of the work from the same, and independently operable actuating means for said severing devices, whereby the upper thread may be severed in advance of the lower thread to permit the cut end of upper thread to be drawn below the face of the work by means of the lower thread previous to the severing of the latter.

125 13. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper-thread mechanism and under-thread mechanism, of an upper-thread severing device and an under-thread severing device having its thread-engaging portion spaced from that of the upper-thread severing device to admit the work 130

between them and thus disposed at the opposite side of the work from the same, and successively operable actuating means for said severing devices, whereby the upper thread may be severed in advance of the lower thread to permit the cut end of upper thread to be drawn below the face of the work by means of the lower thread previous to the severing of the latter.

10 14. In a sewing machine for forming groups of stitches, the combination with stitch-forming devices comprising upper-thread mechanism and under-thread mechanism, of an upper-thread severing device, an under-
15 thread severing device, an under-thread pull-off, a connection between the under-thread severing device and the pull-off whereby the latter is caused to operatively engage the
20 thread in advance of the former, and actuating means for said upper and under thread severing devices whereby the upper thread may be severed prior to the engagement of the lower thread by the pull-off and lower-thread severing device.

25 15. In a sewing machine for forming groups

of stitches, the combination with stitch-forming devices comprising upper-thread mechanism and under-thread mechanism, of an upper-thread severing device and an under-thread severing device having its thread-engaging portion spaced from that of the upper-thread severing device to admit the work between them and thus disposed at the opposite side of the work from the same, and actuating means whereby the lower thread severing device may be operated after the operation of the upper thread severing device, thus providing an interval between the severing operations in which the unsevered lower thread may operate to draw the severed end of upper thread below the face of the work.

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

EDWARD B. ALLEN.

Witnesses:

HENRY J. MILLER,

HENRY A. KORNEMANN.