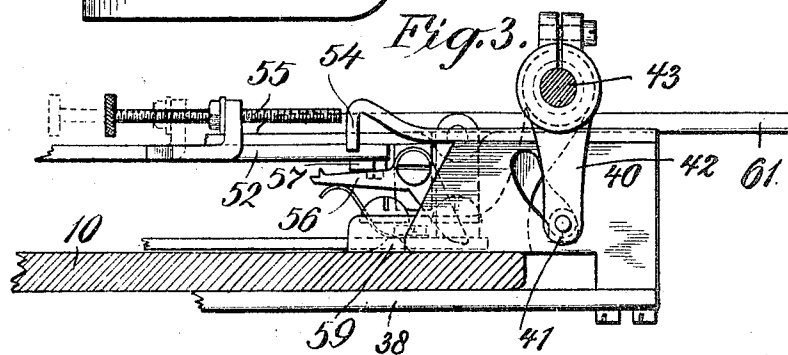
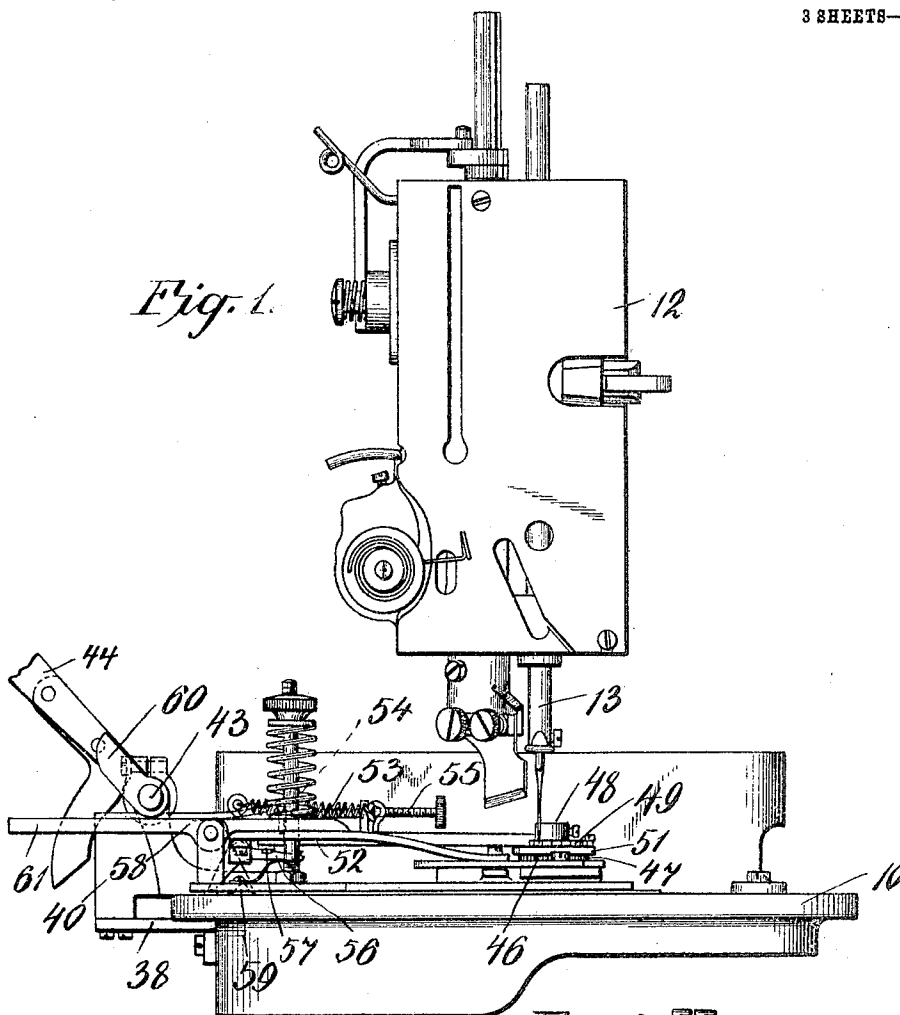


957,265.

Patented May 10, 1910.

3 SHEETS—SHEET 1.



WITNESSES:

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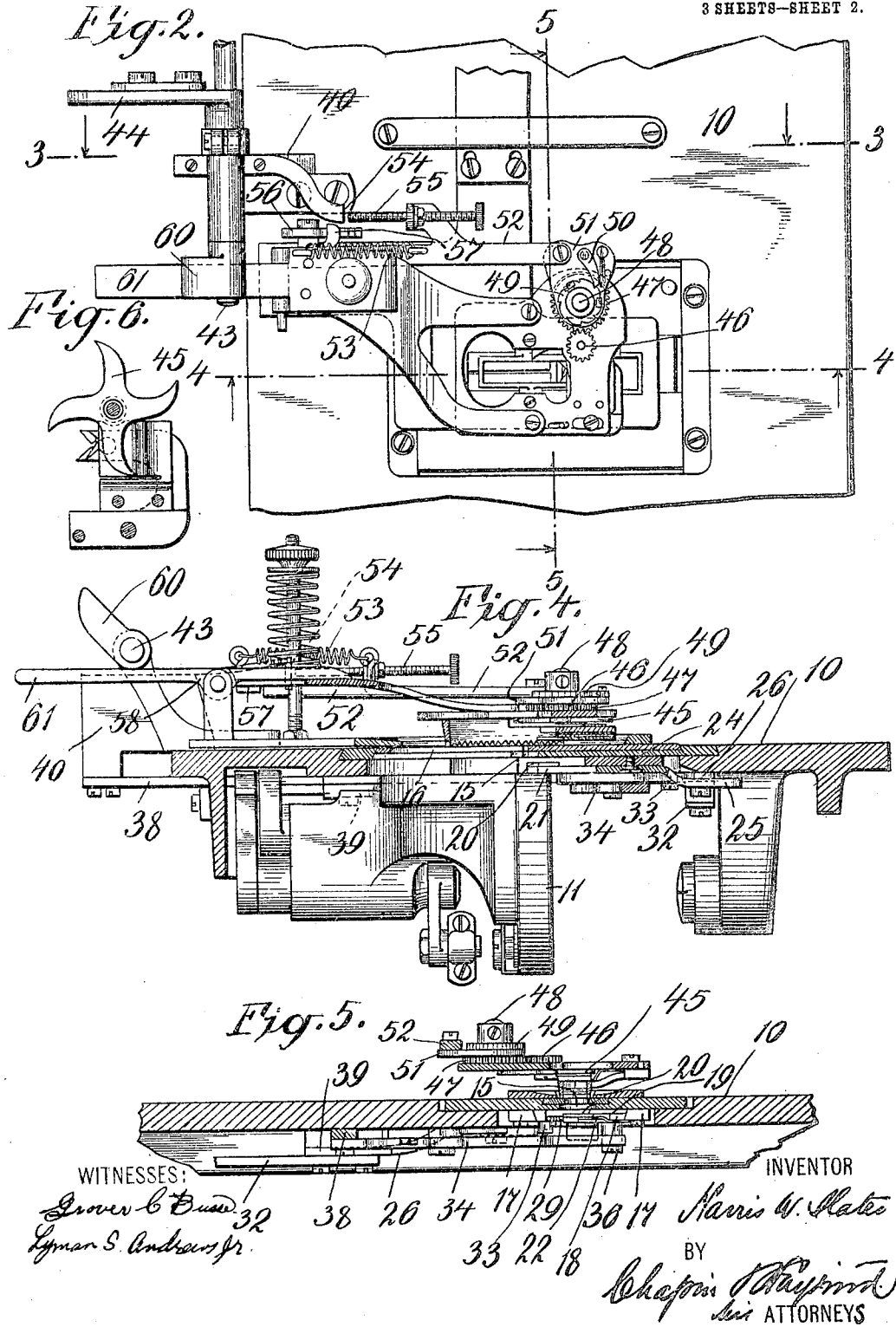
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957,265.

Patented May 10, 1910.

3 SHEETS—SHEET 2.



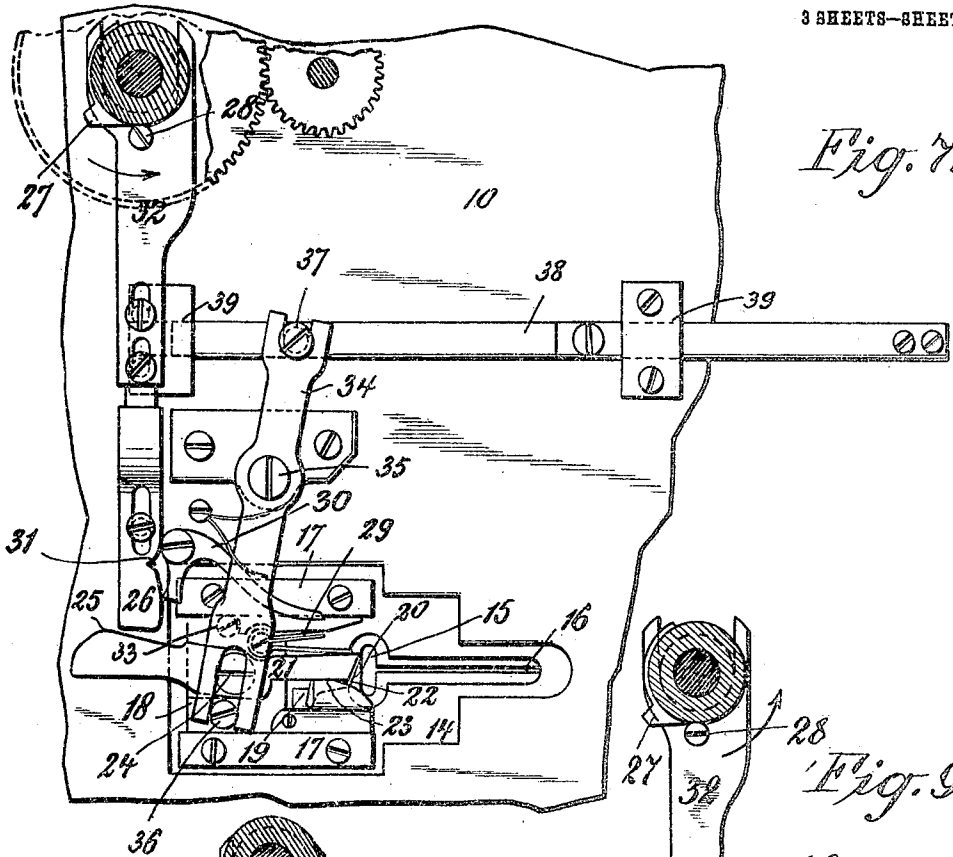


Fig. 7.

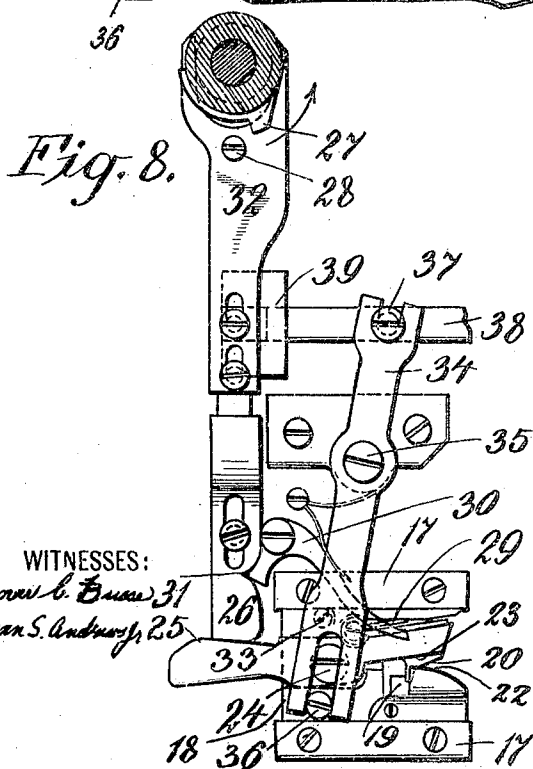


Fig. 8.

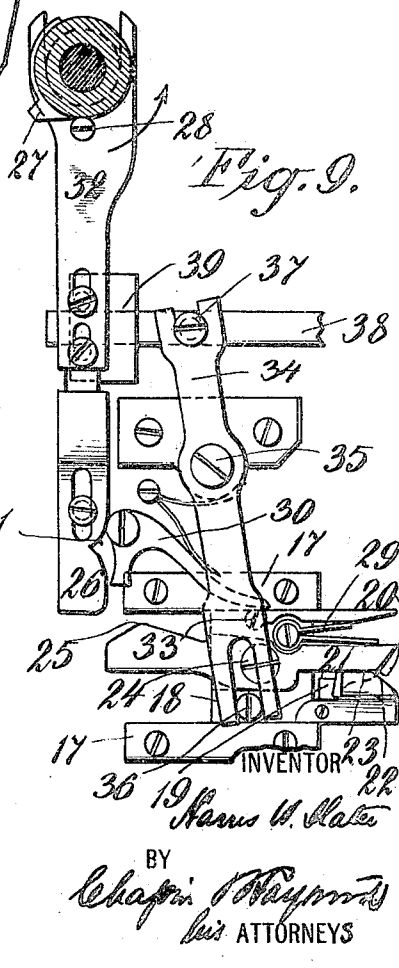


Fig. 9.

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UNITED STATES PATENT OFFICE.

HARRIS W. SLATER, OF LAKE MAHOPAC, NEW YORK, ASSIGNOR TO THE NATIONAL MACHINE COMPANY, OF MAMARONECK, NEW YORK, A CORPORATION OF NEW YORK.

THREAD-TRIMMING MECHANISM.

957,265.

Specification of Letters Patent.

Patented May 10, 1910.

Application filed August 23, 1907. Serial No. 389,795.

To all whom it may concern:

Be it known that I, HARRIS W. SLATER, a citizen of the United States of America, and a resident of Lake Mahopac, county of Putnam, State of New York, have invented certain new and useful Improvements in Thread-Trimming Mechanism, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in thread trimming mechanism, and particularly to improvements in thread trimming mechanism adapted for employment in connection with buttonhole sewing machines.

My invention consists first in an improved under thread trimming means generally, including means by which the trimmed end of the thread will be gripped and held ready for another sewing operation, and further, when once gripped, will be so held until after a fresh stitching operation has been commenced, even though the actuating means therefor may be again operated in the mean time, and, second, in a means whereby the upper thread gripping mechanism will also be maintained in an inoperative condition after the first operation thereof and until the machine has subsequently done a certain amount of work.

The objects of my invention are, first, to positively trim the under thread of a two-thread sewing machine, and to hold the severed thread end ready for the next sewing operation, and, second, to prevent the releasing of the thread ends held by both the upper and lower thread trimming and holding mechanism until after such an amount of work has been done by the machine in a subsequent sewing operation as will properly hold the thread ends in the goods, whereby a second operation of the trimming mechanism actuating means by the attendant before the thread ends are held by the goods, will not release such thread ends from the gripping mechanism.

My invention also consists in certain novel details of construction and combination of parts as will hereinafter more fully appear, and, in order that my invention may be thoroughly understood, I will now proceed to describe mechanism constituting an embodiment thereof, having reference to the accompanying drawings illustrating the

same, and will then point out the novel features in claims.

In the drawings: Figure 1 is a view in end elevation of a buttonhole sewing machine provided with a trimming mechanism embodying my invention. Fig. 2 is a top view of the machine at and around the point of sewing. Fig. 3 is a detail view in vertical transverse section, the section being taken substantially upon the plane of the line 3—3 of Fig. 2. Fig. 4 is a view in transverse vertical section through the machine upon the plane of the line 4—4 of Fig. 2. Fig. 5 is a detail vertical longitudinal section, the line of section being taken substantially upon the plane of the line 5—5 of Fig. 2. Fig. 6 is a detail view of a star wheel employed, with certain co-acting and correlated parts. Fig. 7 is a detail under-side view of the machine, showing particularly the under-thread trimming mechanism. Figs. 8 and 9 are similar detail views showing the parts in different positions.

The machine illustrated is of a well known two-thread buttonhole sewing variety, and includes a bed plate 10, in which the shuttle mechanism 11, comprising the under-thread mechanism, is supported, and an overhanging arm 12 in which the vertically reciprocating and laterally vibrating needle bar 13, comprised in the upper-thread mechanism, is supported.

I will first describe the under-thread trimming mechanism: Mounted upon the bed plate 10 is the usual throat plate 14, in which there is an aperture 15 for receiving the needle, and a slot 16 for receiving the cutter. Guides 17 are secured to the under side of the said throat plate, and mounted to reciprocate in said guides is a slide or carrier 18. This slide carries with it a pair of shears for trimming the under thread, and a pair of nipping jaws or grippers for nipping the said under thread after it has been severed. The pair of shears comprises a stationary knife blade 19, and a relatively movable knife blade 20 which is secured to, and carried by, a lever 21. The gripping jaws comprise a stationary jaw 22 and a relatively movable jaw 23 secured to, or formed as a part of, the lever 21. The lever 21 is pivoted at 24 to the under side of the slide 18, and is provided with a rearwardly extending portion 25 which is designed to be engaged by

the toe 26 of a slide piece 32. The slide piece 32 is mounted to slide longitudinally upon the under side of the bed plate 10 of the machine, being adapted to be engaged and operated by a cam 27 located beneath the bed plate 10 and operatively connected with the usual driving and timing mechanism of the machine. The cam 27 is arranged to be given a single rotation for each buttonhole designed to be attached by the machine. In so rotating, a projecting portion of the said cam will engage a cam follower 28 upon the slide 32, and will force the said slide longitudinally in a direction toward the projecting portion 25 of the lever 21. The toe 26 of the said slide will, in fact, engage the portion 25, and will swing the lever 21 upon its pivot 24 against the resistance of a spring 29, which normally tends to force the said lever in the opposite direction, until the gripping jaws and shears are forced to an open position, such as is shown in Fig. 8. A pivoted latch 30 is designed to engage a notch 31 in the said slide 32 when the same is moved to the position shown in Fig. 8, such pivoted latch holding the slide in its adjusted position after the projecting portion of the cam 27 has moved to a position past the cam follower 28. This position, which is the position of the parts shown in Fig. 8, is the normal position of the machine when a sewing operation is being performed. The shears and nipping jaws are open and their position is such that when the slide or carrier 18 is reciprocated, engaging faces thereof will cross the path of movement of the under thread as it comes from the under-thread mechanism and goes to the work.

When it is desired to cut off the thread the slide 18 is reciprocated in its guides 17, causing the shears and gripping jaws to pass the opening 15 in the throat plate and to engage the under thread as they so pass. As the slide 18 is given the forward portion of its reciprocating movement, a stud 33, which is carried thereby, will engage the pivoted latch 30, causing the same to disengage the notch 31 and thereby to release the slide 32 and the toe 26 thereof from engagement with the projecting portion 25 of the lever 21. This will cause the lever 21 to snap back to a closed position, closing the shears 19, 20 to sever the thread, and bringing the gripping jaws 22, 23 together to nip the end of the thread between them, and also, through the medium of the parts 25 and 26, to move the slide 32 longitudinally in a direction toward the cam 27 to the position in which it is shown in Figs. 7 and 9 of the drawings. Further movement of the slide 18 will have the effect of drawing out a small quantity of the under thread from the shuttle or other device holding it, so that there will be enough thread for

starting up the stitching when the next buttonhole is commenced. The slide 18 is moved forward to about the position in which it is shown in Fig. 9, the grippers carrying the thread end as just explained, and the slide is then returned to its first position, as is shown in Fig. 7; but when it is returned to the position shown in Fig. 7, it will be seen that, by reason of the fact that the latch 30 has disengaged the notch 31, the toe 26 of the slide 32 will be out of the path of movement of the projecting portion 25 of the lever 21, and hence the said lever will remain in its tripped position. Subsequent reciprocating movements of the slide 18 will have no effect upon the gripping or trimming devices, because of the fact that the said lever remains in its tripped position, so that, should the operator again move the actuating mechanism after the first operative movement thereof, and prior to the time that the machine has again performed sufficient stitching operations to hold the severed thread end, such movement of the actuating mechanism will not open the gripping jaws or shears, and the thread end will hence remain gripped even though the slide which carries said gripping jaws and shears itself reciprocates. It will be readily understood that if such subsequent operations permitted the gripping jaws to open even momentarily, the thread end would be released and there would be trouble when stitching was again attempted to be started up. Before the completion of the next group of stitches the cam 27 will have re-set the slide 32, which will, in turn, have re-set the lever 21 to its open position, and the pivoted latch 30 will have again engaged the notch 31 to hold the parts in such position, all as has been clearly shown in Fig. 8.

The slide 18 is reciprocated by means of a lever 34, which is pivoted at 35 to the under side of the bed plate of the machine, and engages at one end a pin 36 secured to the slide 18, the said lever at its other end being engaged by a stud 37 upon a sliding bar 38 mounted to slide in ways 39 secured to the under side of the bed plate 10. At its outer end the bar 38 carries a cam piece 40, which is engaged by a stud 41 carried by an arm 42 upon a rock shaft 43. The rock shaft 43 is provided with an operating arm 44, by which it may be manually or otherwise operated, as may be desired. In its rocking or oscillating movements, movements of reciprocation will be imparted to the bar 38, as will be well understood, and hence similar reciprocating movements in the opposite direction will be imparted to the slide 18.

The upper-thread trimming and gripping mechanism is of the type described and claimed in Letters Patent of the United

States No. 908,619, granted to me January 5, 1909, and detailed description of the same is not necessary herein. It is sufficient to say that the gripping mechanism includes a star wheel 45, to which step by step movements of rotation are imparted through the medium of a pinion 46 secured to the said star wheel 45, a spur gear 47 in mesh therewith and mounted upon a vertical stud 48, a ratchet wheel 49 secured to rotate with said spur gear 47, a pawl 50 mounted upon a pawl-carrying plate 51, mounted concentrically with relation to said gear 47 and ratchet wheel 49, and a reciprocating operating bar 52 pivotally connected at one end to the said pawl-carrying plate 51. A spring 53 exerts tension normally to draw the reciprocating bar in one direction, while positive operating means comprising a toe 54 is provided for moving the said bar in the other direction. The toe 54 is secured to the cam piece 40 and reciprocates therewith whenever the rocking bar 43 is oscillated. This toe piece 54 is arranged in line with an adjusting screw 55, which is carried by the operating bar 52. When the toe piece 54 is moved forward it will engage the screw 55, and will move the bar 52 forward to impart an operative movement to the pawl carrying plate 51, and hence to the star wheel 45. Upon the return of the toe piece 54, the said bar 52 (unless otherwise prevented from so doing) will return to its first position under the influence of the spring 53, thereby bringing the pawl 50 into a position to pick up another tooth upon the ratchet wheel 49. To prevent subsequent oscillating movements of the rocking bar 43, which may be given thereto after the first operative movement thereof, and prior to the sewing of a new group of stitches, from imparting any further movement to the star wheel, I have provided a means for locking the said operating bar 52 in its forward position after it has been once moved forward, said bar being released only after the commencement of the sewing of a fresh button-hole. This means comprises a pivoted latch 56, which is normally spring pressed in a direction to engage a toe 57 carried by the bar 52. When the bar 52 is moved forward, the latch 56 will spring into position to engage the said toe 57, and will thus hold the bar in its extended position until the said latch is tripped. The latch is carried by the work clamp 58, and the said latch therefore travels with the work clamp when the said work clamp is moved to feed the work during the operation of sewing a button hole. A projection 59 is provided upon the bed plate 10 of the sewing machine in a line with a portion of the said pivoted latch, whereby, as the work clamp is moved forward in a stitching operation, the pivoted latch will be tripped by such projection and will re-

lease the operating bar 52 to permit it to return to a normal position.

From the foregoing it will be seen that the rocking shaft 43 operates both upper and lower trimming mechanisms, but the said rocking shaft is also provided with a toe 60, which engages a portion 61 of the work clamp of the machine to open the said work clamp at the end of a sewing operation. When, therefore, the attendant operates the said shaft to release the work at the end of a sewing operation, the same movement also actuates both upper and lower trimming mechanism. The work is now moved to be adjusted for another sewing operation, but it often happens that after the work clamp has been lowered into position, it becomes necessary to again lift same to re-adjust the work, owing to the fact that the work has not been so far properly adjusted. If some means were not provided to prevent this second actuation from operatively acting upon the upper and lower thread trimming mechanism, the thread ends which are held thereby would be released, but it will be understood from the foregoing that the pivoted latch 54, in the case of the upper thread mechanism, and the cam 27, slide 32 and other correlated and co-acting parts, in the case of the lower thread mechanism, will prevent such subsequent actuations of the rocking shaft 43 from affecting the thread trimming and gripping means until after the machine has again moved a certain distance in the next sewing operation. After it has moved such a distance the thread ends will be held in the work, as will be well understood.

What I claim is:

1. In a two-thread sewing machine, the combination with stitching means including upper and lower thread mechanisms, and operating means therefor, of a thread gripping device for the lower thread, another thread gripping device for the upper thread, manual operating means for the two said grippers, mechanism including elements movable to inoperative positions upon the operation of the gripping devices by the said manual operating means, whereby subsequent movements of the said operating means will fail to operate the said gripping devices to grip or release the threads, and resetting means for the said elements automatically operated after subsequent operation of the stitching mechanism.

2. In a sewing machine, the combination with stitching mechanism, of a work clamp, a thread gripping device, manual operating means for the thread gripping device and the work clamp, a latch for locking the gripping device in its operated position, and means operated upon feeding movements of the work clamp to release the said latch.

3. A thread gripping and trimming de-

vice for the under thread of a two-thread sewing machine comprising a reciprocating slide, relatively movable gripping elements and relatively movable trimming elements all mounted upon said slide, manual operating means for reciprocating the said slide, tripping means for tripping the said elements upon the reciprocation of said slide, and re-setting means for the said elements, operating after the said slide has been returned to its normal position.

4. A thread gripping and trimming device for the under thread of a two-thread sewing machine comprising a reciprocating slide, relatively movable gripping elements and relatively movable trimming elements all mounted upon said slide, manual operating means for reciprocating the said slide, tripping means for tripping the said elements upon the reciprocation of said slide, and re-setting means for the said elements, operating after the said slide has been returned to its normal position, said re-setting means including a rotating cam.

5. In a two-thread sewing machine, the combination with a throat plate, of a slide mounted beneath same, a relatively stationary gripping jaw secured to said slide, a relatively stationary cutting blade also secured to said slide, a pivoted lever provided

with a gripping jaw, and a cutting blade complementary to the said stationary gripping jaw and cutting blade, a spring normally tending to move the said lever to close the said movable gripping jaw and cutting blade, means operating upon the said lever while the slide is at rest to move the lever in a direction opposed by the tension of said spring, a latch for holding the parts in the last said position, and means operating upon the latch to trip same upon a reciprocating movement of said slide.

6. In a two-thread sewing machine, the combination with a throat plate, of a slide mounted to reciprocate beneath same, manually operated means for effecting such reciprocating movements, relatively movable gripping devices and relatively movable cutting devices all carried by said slide, means operated by the driving mechanism of the machine and while the said slide is at rest for forcing the said blades and gripping devices apart, a latch for holding them apart, and means for tripping the latch upon a reciprocation of the said slide.

HARRIS W. SLATER.

Witnesses:

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ELLIOT C. HOUSE.