No. 765,622. PATENTED JULY 19, 1904.

A. JEUDE.

# THREAD CUTTING AND CLAMPING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED APR. 4, 1904.

NO MODEL. 5 SHEETS—SHEET 1.

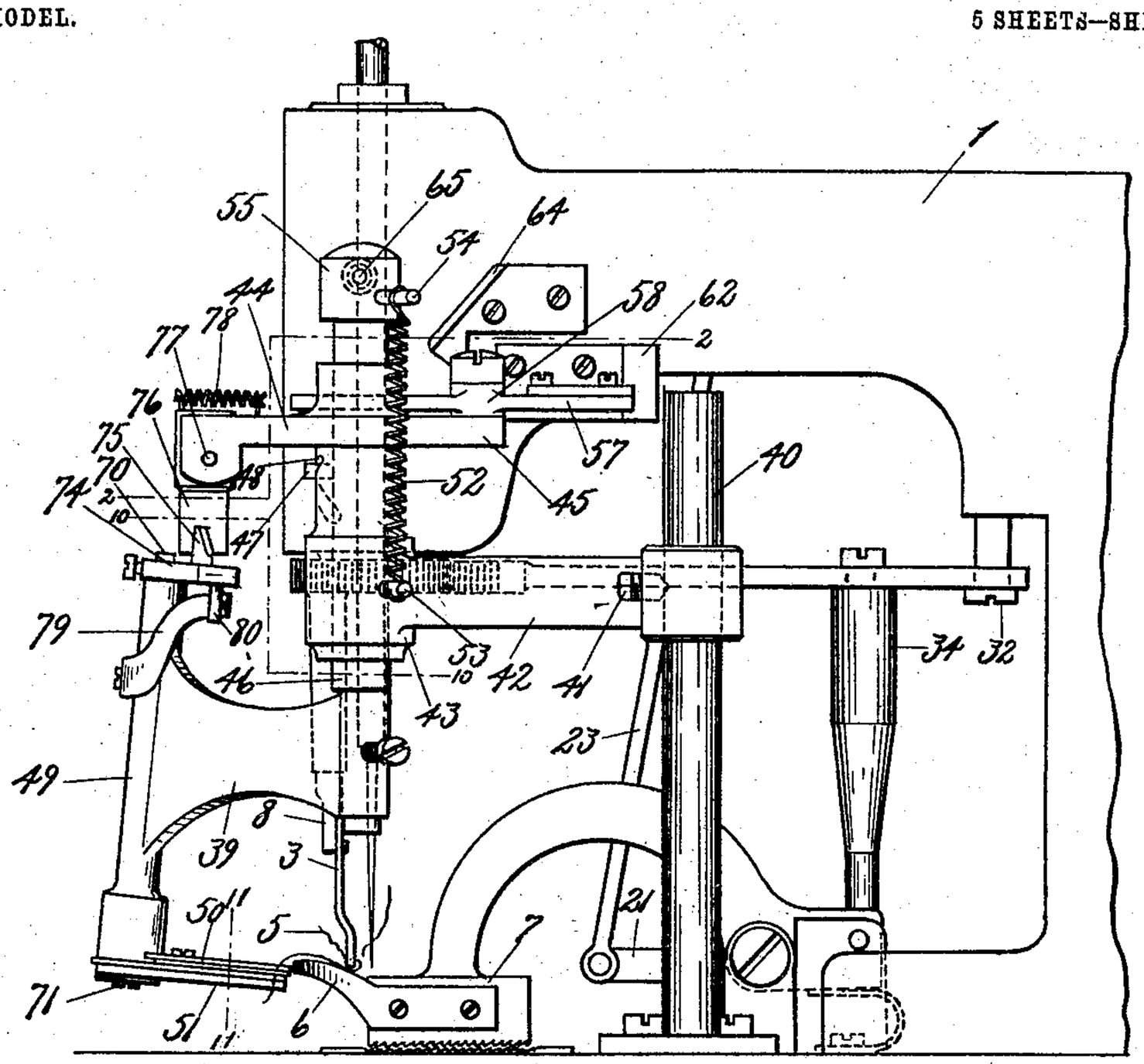


Fig. 1

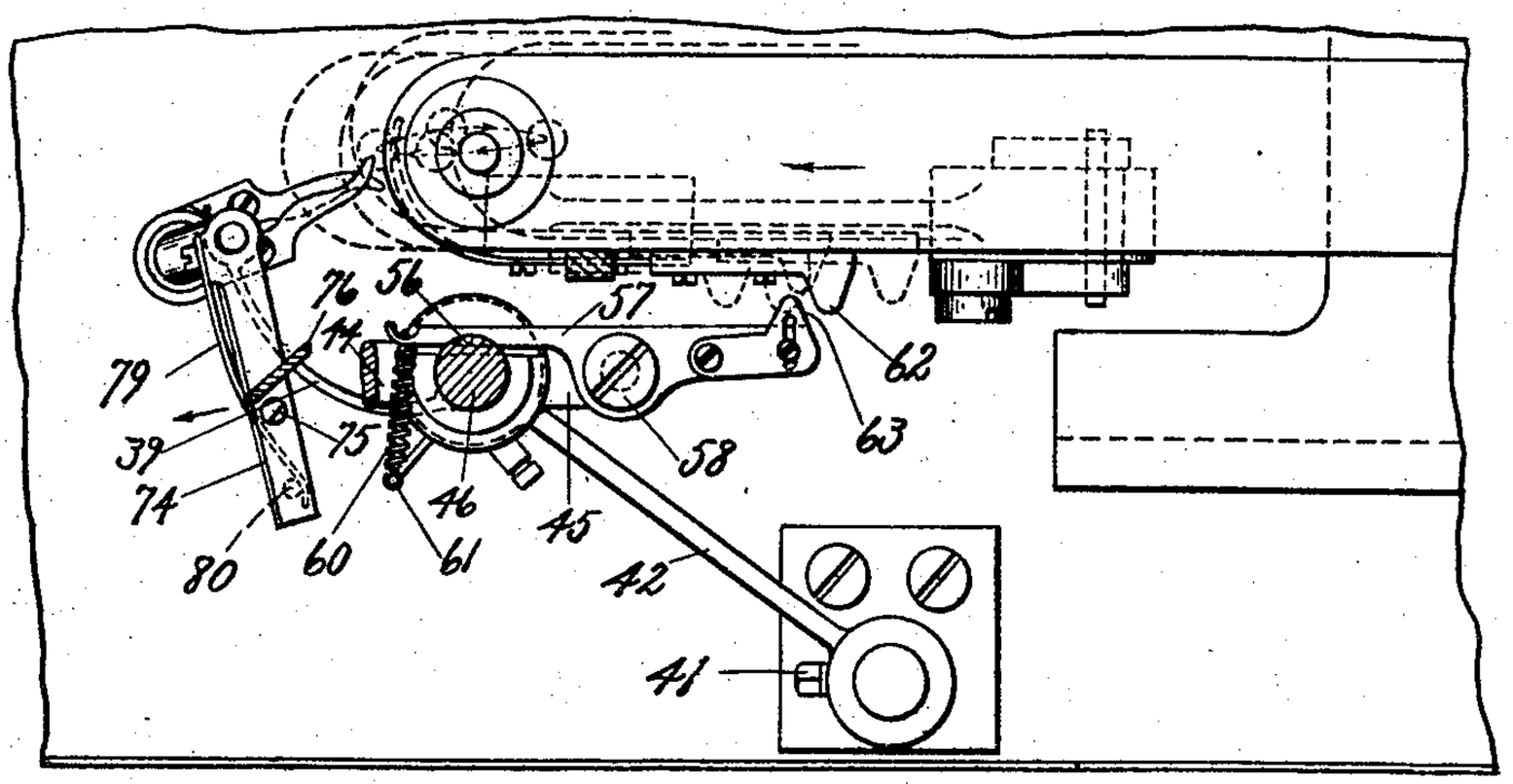


Fig. 2.

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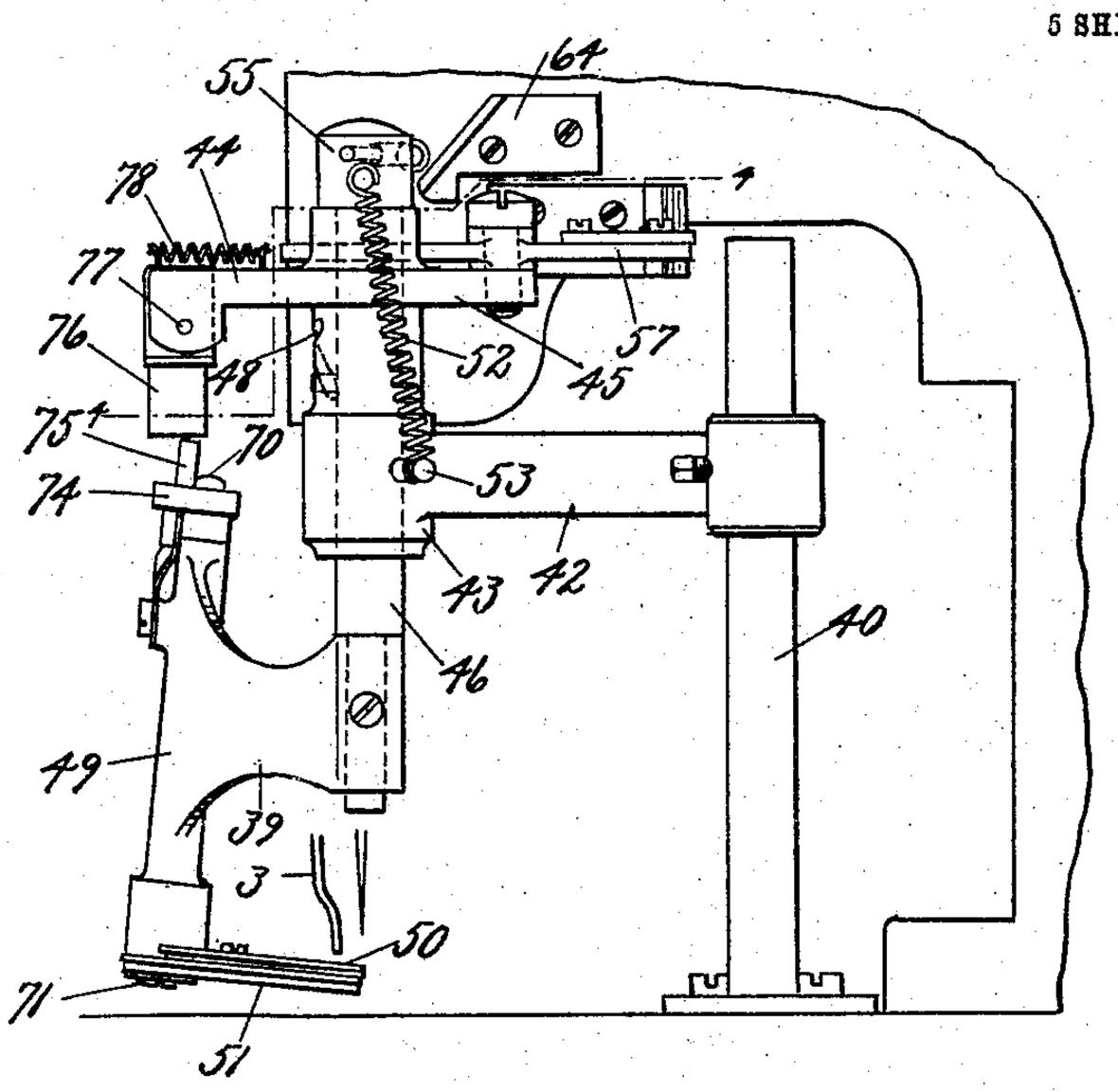


Fig. 3.

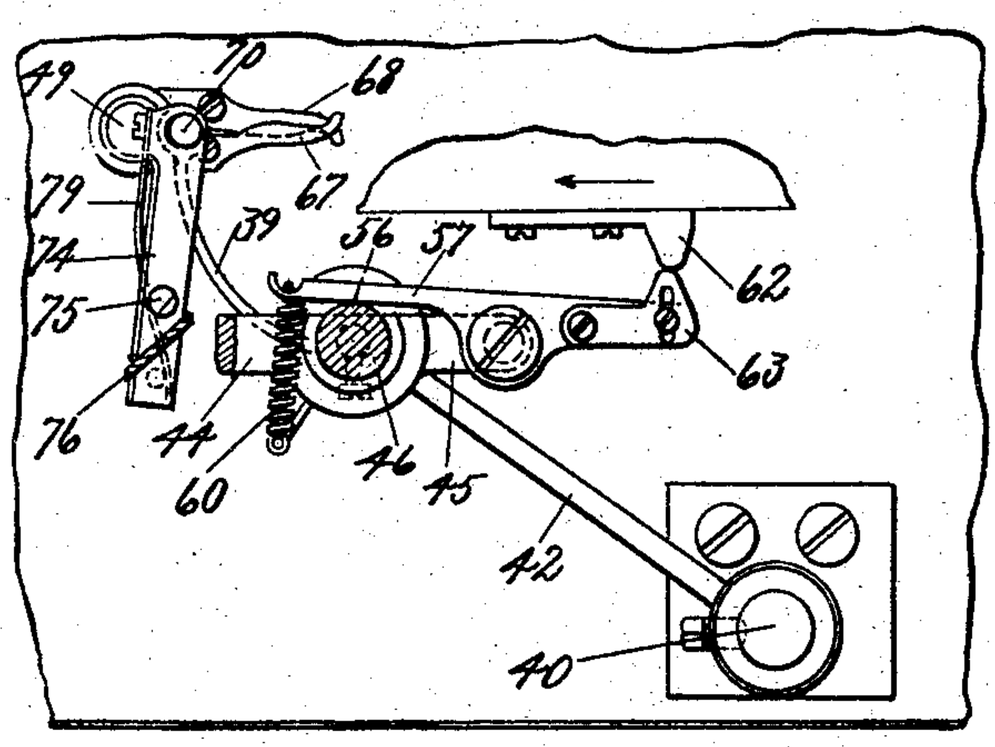


Fig. 4.

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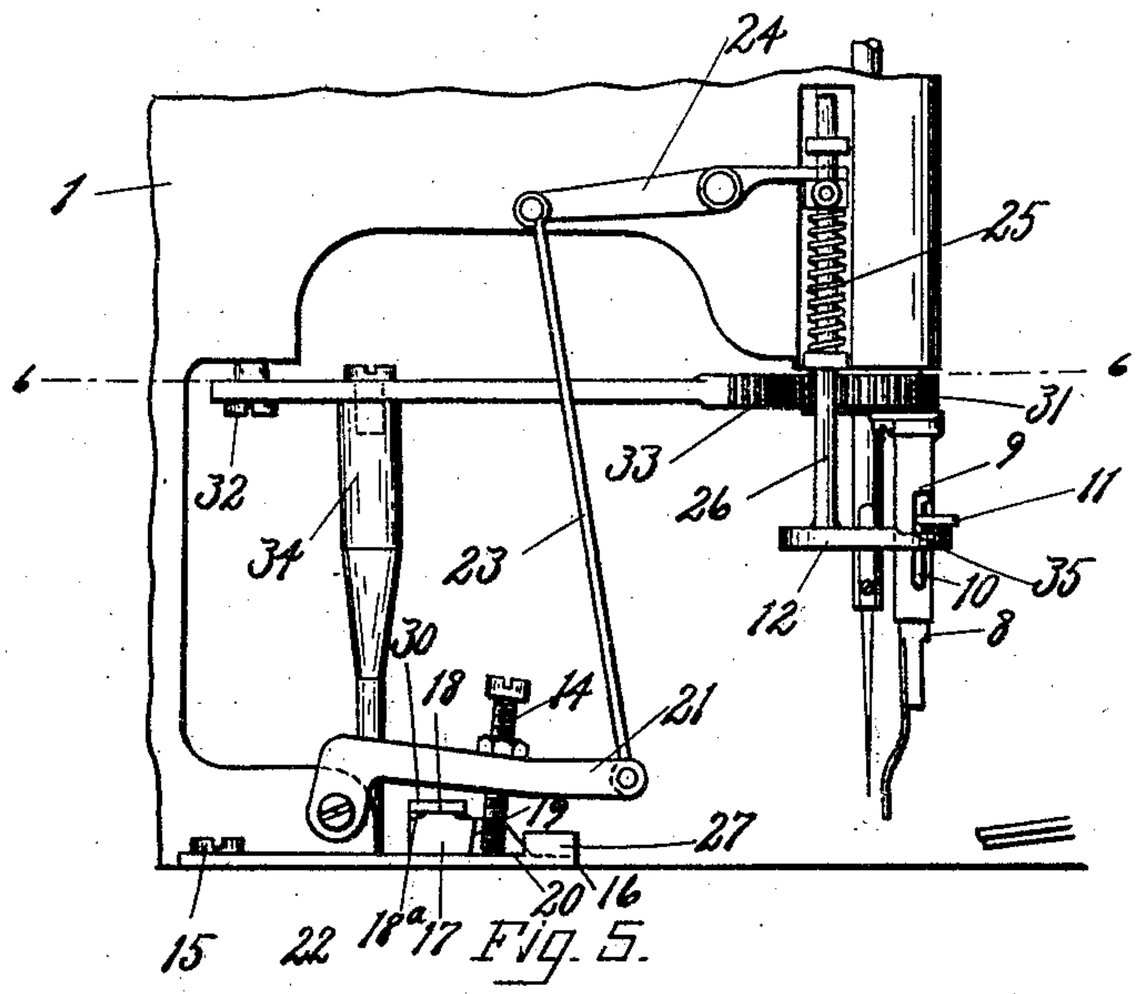


Fig. 5.

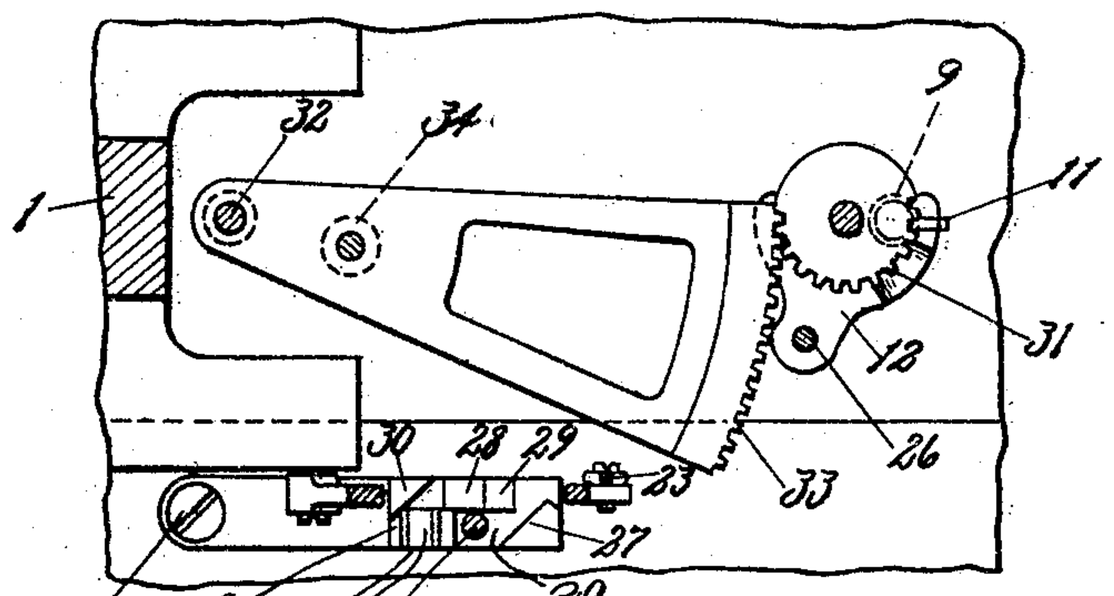


Fig. 6.

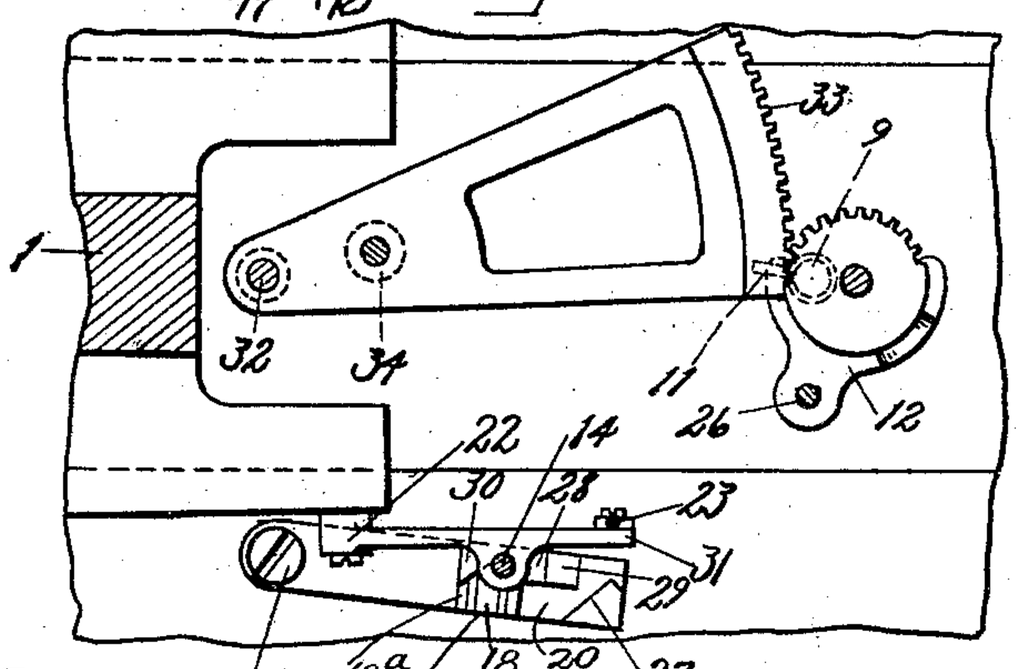


Fig. 7.

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NO MODEL. 5 SHEETS—SHEET 4.

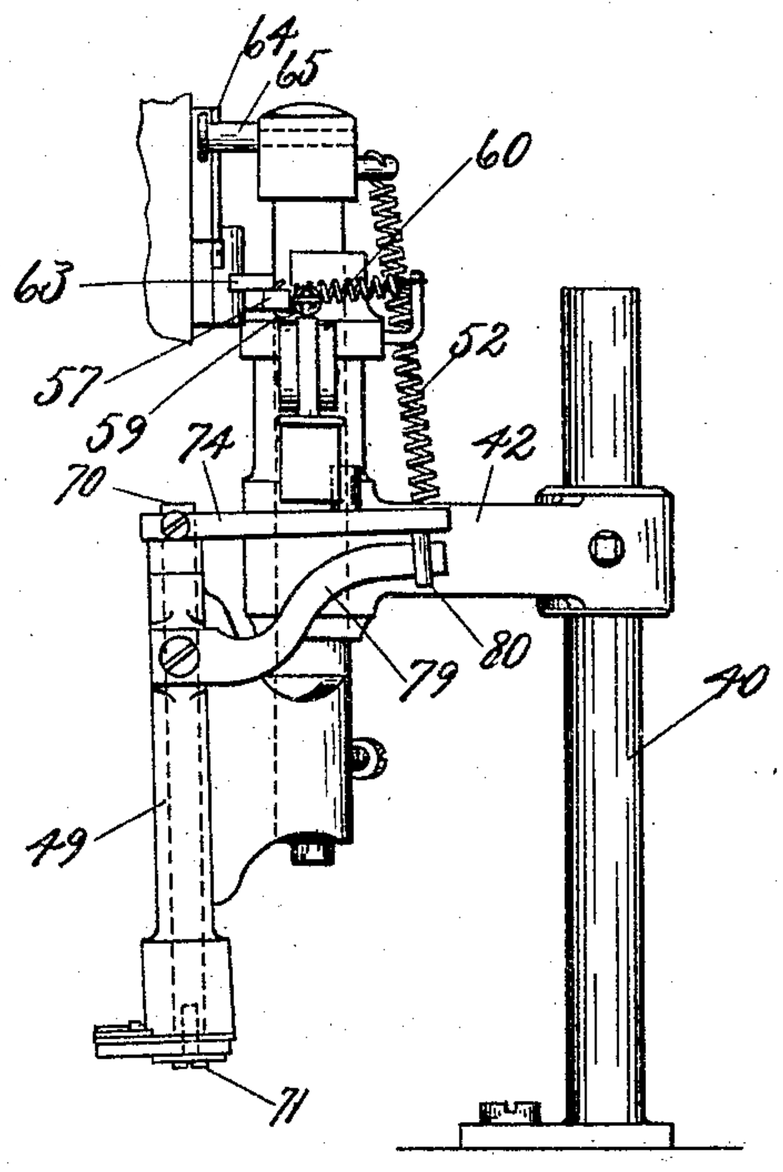


Fig. 8.

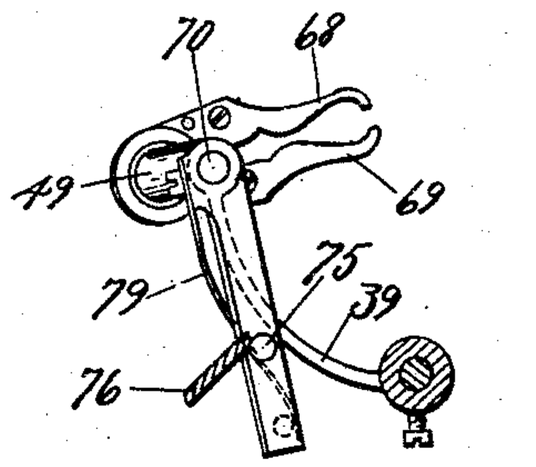


Fig. 10.

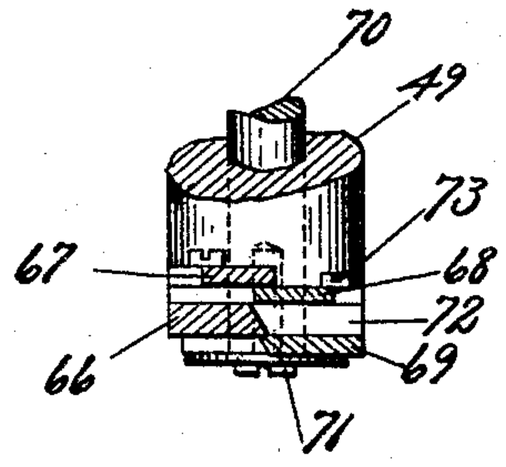


Fig. 11

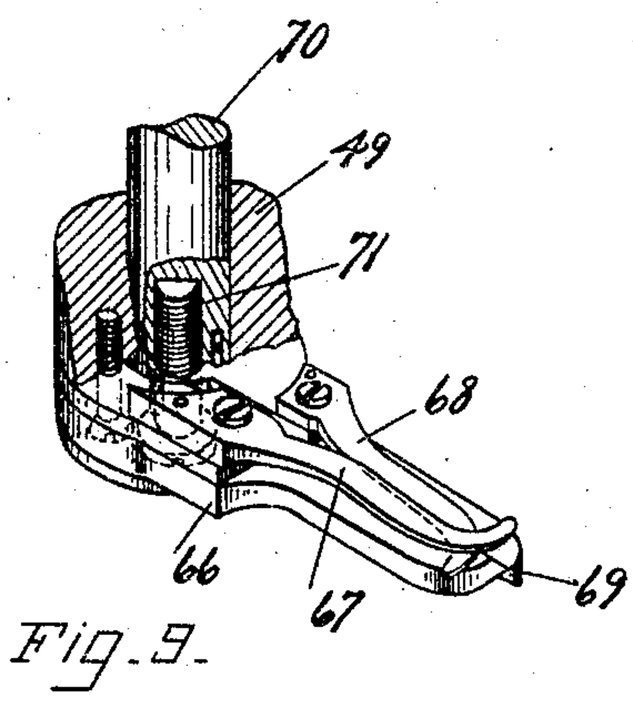


Fig. 9.

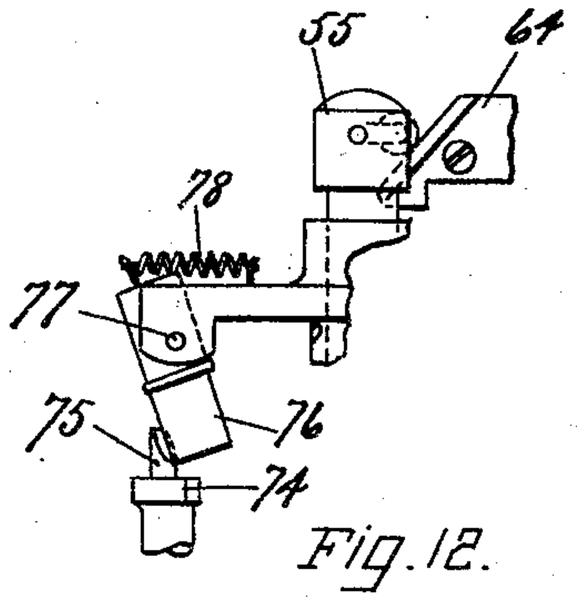


Fig. 12.

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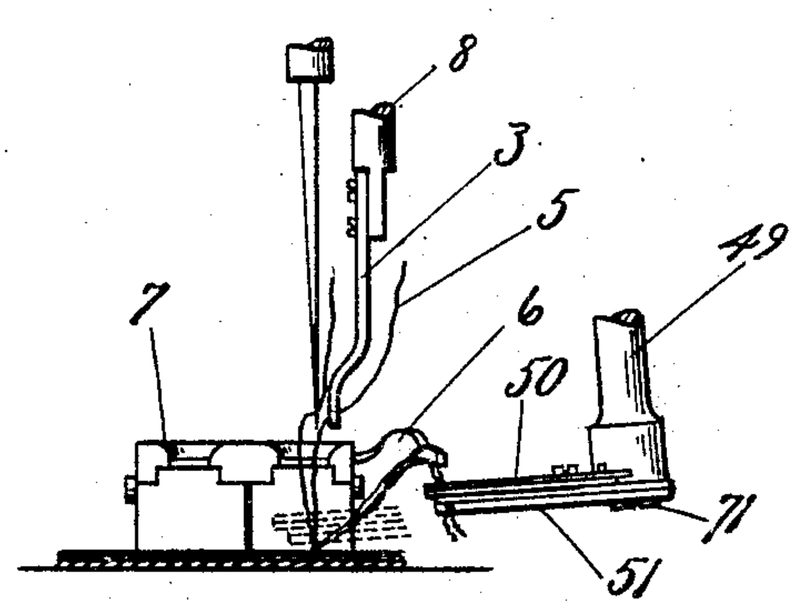


Fig. 13.

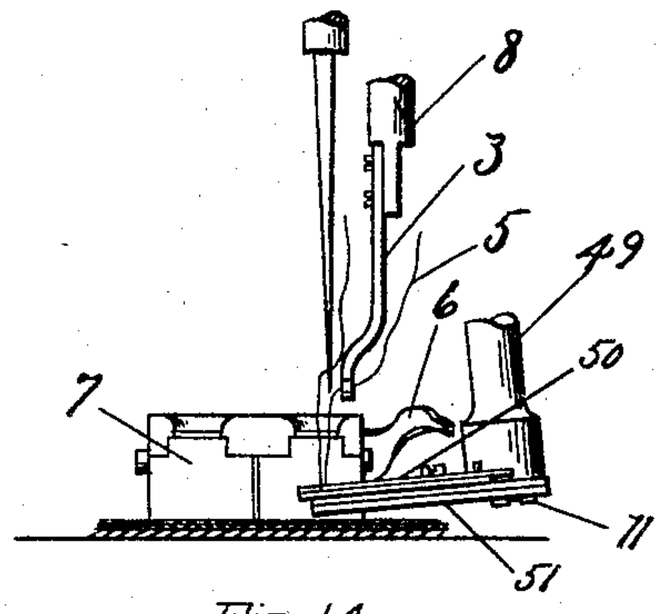


Fig. 14.

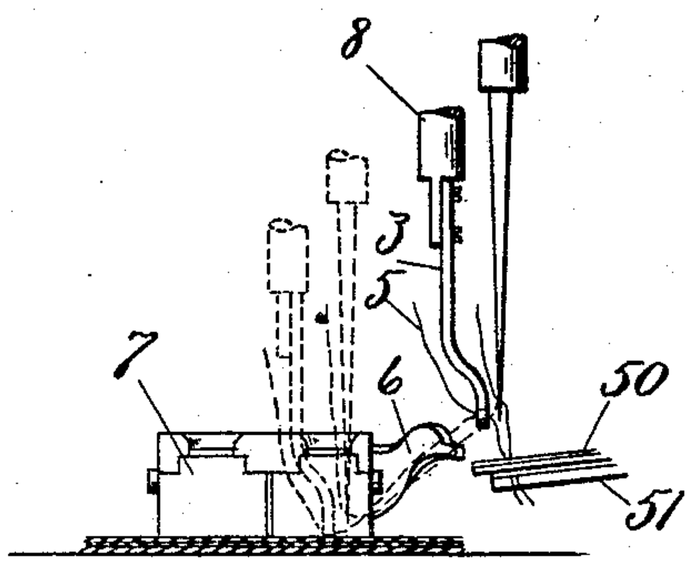


Fig. 15.

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# UNITED STATES PATENT OFFICE.

AUGUST JEUDE, OF OKRIFTEL, NEAR HATTERSHEIM-ON-THE-MAIN, GERMANY, ASSIGNOR TO AARON VAIL ROWLEY, OF FRANKFORT-ON-THE-MAIN, GERMANY.

## THREAD CUTTING AND CLAMPING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 765,622, dated July 19, 1904.

Original application filed August 7, 1901, Serial No. 71,181. Divided and this application filed April 4, 1904. Serial No. 201,552.

(No model.)

*To all whom it may concern:*

Be it known that I, AUGUST JEUDE, a subject of the Emperor of Germany, and a resident of Okriftel, near Hattersheim-on-the-Main, in the German Empire, have invented certain Improvements in Thread Cutting and Clamping Mechanisms, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to devices to be used in connection with sewing-machines.

The invention is described as applied to a buttonhole-sewing machine of the well-known type in which the sewing is effected by means of a straight needle located above the work and moving vertically and a curved needle located below the work and in which the sewing instruments are carried by an arm of the machine which moves with relation to the work, the work remaining stationary. This machine is not described in detail herein, as it is well known in the art. The invention is not restricted in its application to this particular type of sewing-machine, however, as many of its features may be used in connection with any sewing-machine.

The form of the machine shown is that disclosed in my application, Serial No. 71,181, filed August 7, 1901, of which this application is a division. In that application is claimed novel seam-forming mechanism, an important feature of which is means to place an insertion-thread on the cut edge of the buttonhole, so that it is held in place by the stitches when formed. For the purpose of positioning this thread properly a thread-guide is provided, which is arranged to move in advance of the needle.

It is desirable to provide means to clamp the free end of the thread so guided while the buttonhole-seam is being sewed, as well as to hold the thread leading to the needle. This relieves the operator from the necessity of manually holding the free ends of the several threads in proper relation to the stitch-forming mechanism in starting the seam. The present application embraces as one feature, therefore, means for holding free thread ends, applicable to any machine in which they may occur, and the preferred embodiment of this portion of the invention is a clamp which retains its hold on the threads until the completion of the seam and then releases them and engages the threads leading from the last end of the seam. It is also desirable in the sewing-machine art, and particularly in connection with buttonhole-sewing machines or analogous machines, to provide means to trim the loose thread ends after the completion of a seam, as well as to cut the threads extending between the work and the sewing mechanism. I have herein described and claimed means by which both of these operations may be secured. I have provided novel thread-cutting mechanism which trims the several threads close to the work and which may be easily applied to machines of other types. In the application of this cutter which is disclosed I have so associated it with the thread-clamp that the cutter automatically catches the threads when released by the clamp and cuts them off.

For the purpose of facilitating the trimming off of the thread ends I have provided a thread-holder to support the end portions of threads leading to the beginning of the seam, particularly during the interval between the release of said thread portions by the clamp and the severing of them by the cutter. This permits the thread ends to be trimmed very close to the face of the work.

Other features of the invention, including combinations of parts and details of construction, will be hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a portion of a buttonhole-sewing machine with my invention applied. Fig. 2 is a view, partly in plan and partly in horizontal section, on the line 2 2 of Fig. 1. Fig. 3 is a side elevation showing the thread cutting and clamping mechanism released. Fig. 4 is a horizontal section on line 4 4 of Fig. 3. Fig.

5 is a side elevation of a portion of the seam-forming mechanism. Fig. 6 is a horizontal section on the line 6 6 of Fig. 5. Fig. 7 is a view similar to Fig. 6, showing the parts in a different position. Fig. 8 is an end elevation of the thread cutting and clamping mechanism proper. Fig. 9 is a view in perspective of the clamp and cutter. Fig. 10 is a horizontal sectional view on the line 10 10 of Fig. 1. Fig. 11 is a vertical sectional view on the line 11 11 of Fig. 1. Fig. 12 is a fragmentary view showing the position of the parts in the return movement of the cutter and clamp, and Figs. 13, 14, and 15 are views showing different positions assumed by the sewing mechanism and the cutter and clamp.

In the machine illustrated by the drawings the seam-forming mechanism, which forms the subject-matter of my earlier application above referred to, will first be briefly described. The insertion-thread 5 is supplied from a suitable spool and passes through an eye 4 in a thread-guide 3. This thread-guide is carried in the specific manner presently to be stated upon the arm 1, which moves to and fro in the direction of the arrow, said direction being parallel to that of the buttonhole. The seam is formed by two needles or any suitable stitch-forming mechanism. The thread-guide 3 has its eye arranged somewhat eccentrically to the guide-holder 8, which has a vertical movement in the socket 9. A pin 11 projects from the shank or holder 8 through a slot 10 in said socket and rests upon a disk or flange 12, which embraces the thread-guide. The flange 12 is secured to the lower end of a vertically-movable rod 26, which is normally held in its upper position by a spring 25. The rod 26 may be pressed downward by means of a lever 24, which is connected by a rod 23 with a rocking arm 21, pivoted at 22 to the foot of the arm 1. On the frame of the machine is mounted an abutment-piece or controlling-piece 16, which therefore does not share the reciprocating movement of the arm 1. This controlling-piece, however, is capable of a slight angular movement, being pivotally mounted at 15. The controlling-piece carries a block 17 with a projection 18 at the top and a depression $18^a$ at the end of said block. Block 17 has a substantially perpendicular shoulder 19, which leads to a horizontal surface 20, on which is adapted to bear a screw 14, carried by the arm 21. To the right of this horizontal surface, in Figs. 5 and 6, is located an oblique or deflecting member 27, and adjacent to the block 17 at one side thereof is located another deflecting-surface, 30, and another block, 28, to which leads an inclined surface 29. The inclined surface 29, the block 28, and the deflecting-surface 30 are substantially in a straight line, and in another straight line, which is practically parallel with the one first mentioned, I arrange the block 17 and the deflector 27. It will be understood that as the arm 1 reciprocates it will carry the screw 14 with it, and if the arm moves to the right from the position shown in Fig. 5 the screw will come in contact with the deflector 27 and will thus cause the controlling-piece 16 to swing laterally on its pivot 15. Owing to this swinging movement, the screw 14 will at the movement of the arm 1 toward the left ride up the incline 29, so as to reach the top of the block 28 and will finally engage the deflector 30. This will cause the controlling-piece 16 to swing back to its original position and will bring the screw 14 onto the portion $18^a$ of the block 17, which portion, as before stated, is slightly lower than the projection 18. The projection 18 and the block 28 are at substantially the same level. It will be readily understood that as the screw 14 moves up and down a similar motion is imparted to the rocking arm 21, and this motion is transmitted in a reverse direction to the rod 26 and to the flange 12, carried by said rod. This flange is provided with a depression or recess 35, which is adapted to be engaged by the pin 11 of the holder 8 when said holder is in a predetermined position, as will be hereinafter described. The sleeve or socket 9, in which the guide-holder 8 moves, is provided with a toothed sector 31, journaled at its center upon the arm 1. The sleeve 9 is located eccentrically with reference to said sector. This sector 31 is in engagement with another toothed sector, 33, mounted to oscillate about a pivot 32, secured upon the arm 1. An arm 34 is provided for moving the sector 33 to and fro.

I have shown as associated with the mechanism above described a means for clamping the thread, preferably combined with a cutter and with a holder to temporarily support the thread when released from the clamp. In the particular embodiment illustrated by the drawings these devices are constructed as follows: Upon a standard 40, secured to the frame of the machine, is rigidly carried, as by means of a set-screw 41, an arm 42, provided at its free end with a socket 43, having arms 44 45 projected in opposite directions from its upper end. In the socket is adapted to move up and down a rod 46, provided with a pin 47, projecting through a helical or screw slot 48 in the socket, so that the rod in moving up and down will also turn about its axis. To the lower end of the rod 46 is rigidly secured an arm 39, carrying at its free end a socket 49, upon which are supported the clamp 50 and the cutter 51. A spring 52 engages a pin 53 upon the socket 43 and also a pin 54 upon the head 55 of the rod 46, so as to tend to move the said rod downwardly. To normally lock the rod 46 in its upper position, I provide said rod with a notch 56, (see Fig. 2,) into which is adapted to project a locking-arm 57, fulcrumed at 58 upon the arm 45. This locking-arm 57 is also adapted to project through

a notch 59 of the socket 43. A spring 60 is employed to draw the locking-arm toward the rod 46, the stationary end of said spring being secured to a pin 61. In order to release the rod 46, I provide an operating member 62 upon the arm 1 of the machine. This operating member is adapted to strike a projection 63 on the locking-arm 57, the projection being preferably adjustable, as shown. The motion of the arm 1 is not purely reciprocating—that is, the forward path and return path are not the same—and thus the operating member 62 engages the projection 63 to release the rod 46 only when the arm 1 moves in the direction indicated by the arrow in Figs. 2 and 4; but on the return motion the operating member 62 passes at such a distance from the projection 63 as not to engage it. It will be understood that as soon as the rod 46 is released the spring 52 will operate to throw the said rod down, causing the clamp 50 and the cutter 51 to move from the upper position (shown in Figs. 1, 13, and 15) to the lower position. (Shown in Figs. 3 and 14.) To bring the rod 46 and the parts carried thereby back to their upper position, I provide an inclined abutment 64 on the arm 1, which abutment is adapted to engage a pin 65, projected from the head 55, so as to raise the said head and the rod 46.

The detail construction of the clamp and of the cutter, together with the mechanism for causing them to open and close, is as follows in the machine illustrated by the drawings: To the lower end of the socket 49 is secured one blade, 66, of the cutter and also one member, 67, of the clamp. The other clamp member, 68, and the other cutter-blade, 69, are rigidly secured to the spindle 70, which is arranged within the socket 49. The cutter-blade 69 is secured by means of a screw 71, and the clamp member 68 is secured either directly to the spindle 70 or to an intermediate piece 72, as by means of a screw 73. The upper end of the spindle 70 is provided with an arm 74, having a contact-pin 75. This pin is adapted to bear against a contact member 76 when the arm 39 moves helically downward. The contact member 76 is suspended from a pivot 77 on the arm 44 and is held in its normal position by a spring 78. It will be understood that the contact member 76 forms an obstruction in the path of the pin 75, so as to detain said pin, and with it the spindle 70, for a time, thus causing the clamp and the cutter to open while the arm 39 continues its movement. In order to close the clamp and the cutter, I provide a spring 79, which is secured to the socket 49 and bears against a pin 80 on the arm 74. In order to allow the contact member 76 to move out of the path of the pin 75 during the return movement of such pin, the said contact member is disposed obliquely, as shown best in Figs. 2, 4, and 10, so that when the pin 75 engages the contact member from the rear it will swing said contact member to one side, as shown in Fig. 12, so that the pin will not be detained, and the clamp and cutter will remain closed. The contact member 76 swings back to its normal vertical position under the influence of the spring 78.

It will be observed that the movement of the thread cutter and clamp to the sewing-thread in the thread cutting and clamping operation is independent of the actuating mechanism for the sewing-machine—*i. e.*, when the desired point in the seam-forming operation has been reached the thread clamp and cutter are automatically actuated to cut and clamp the thread regardless of the further movement of the sewing mechanism or of any of the parts which constitute the general sewing-machine organization. It will also be noted that when the cutter has been moved into proper position relative to the sewing-threads the thread-cutting operation is practically instantaneous. These features have as an advantage that of insuring the complete severance of the sewing-threads.

As a means for holding the thread which leads to the beginning of the seam I have provided a support or holder 6, which preferably is secured to the cloth-clamp or cloth-presser 7 and which is adapted to engage the thread, and particularly the insertion-thread 5, between the fabric and the clamp 50. This holder is shown in Figs. 1, 13, 14, and 15. The operation of the mechanism is as follows:

In the position illustrated by Fig. 1 the thread-guide 3 is above the fabric, and a movement of the arm 1 to the right occurs at first, which brings the parts to the position shown in full lines in Fig. 15. During such movement the screw 14 engages the deflector 27, and thus swings the incline 29 into the path of the screw. As the movement of the arm 1 from right to left takes place the screw 14 rides up the incline 29, and thus the flange 12 and the thread-guide are lowered upon the fabric. This occurs at a slight distance from the end of the buttonhole. As the motion of the arm 1 to the left continues the screw 14 reaches the deflector 30 at the end of the block 28, and thus the controlling-piece 16 is shifted laterally, so that the screw 14 comes to rest on the depression 18ª. This causes the flange 12 and the thread-guide to rise slightly, and inasmuch as the screw 14 engages the depression 18ª when the arm 1 has moved fully to the left it will be understood that this slight raising of the thread-guide 3 occurs at the time the eye of the buttonhole is sewed. While the thread-guide 3 is thus slightly raised it turns through an angle of one hundred and eighty degrees, this movement being effected by the intermeshing sectors 33 and 31, and at the end of this turning movement the recess 35 comes into registry with the pin 11 of the guide-holder 8, so that the thread-guide is again lowered to close contact with the fabric. As the

arm 1 returns toward the right the screw 14 moves on the block 18, and thus keeps the thread-guide 3 down until at the point where the stitching is to cease the screw 14 drops on the horizontal surface 20, thus raising the thread-guide away from the fabric to the position shown in Fig. 5. The thread-guide 3 is turned in the opposite direction by the action of the sectors 31 33 when the end of the buttonhole opposite to the eye is reached. The insertion-thread 5 is laid upon the edge or corner of the fabric at the buttonhole and is securely held in such position by the threads of the stitching mechanism.

In regard to the action of the thread-clamp 50 and the thread-cutter 51 the following explanation is given, with particular reference to Figs. 13, 14, and 15: Fig. 13 shows the upper needle and the thread-guide 3, together with the threads and the clamp, in the position at the end of the sewing operation. The clamp 50 still holds the ends of the threads which lead to the beginning of the seam, these portions of the threads being placed over the guide or holder 6. Then the clamp 50 and cutter 51 move toward the needle and thread-guide, passing below the plane of the holder 6. During this forward movement the clamp releases the threads, which, however, are caught in the angle between the members of the cutter 51, which also receives the thread portions which extend upward from the end of the seam to the upper needle and to the thread-guide 3. While the parts are in this position the blades of the cutter 51 close, so as to cut all four thread portions, and at the same time the members of the clamp close, so as to grip that portion of the thread which will form the beginning for the next seam and the strand of the insertion-thread 5 for the next buttonhole. Thereupon the needle and thread-guide 3 move to the right, as do also the clamp 50 and cutter 51, carrying the parts to the position illustrated by full lines in Fig. 15. From this position the upper needle and the thread-guide 3 return to that shown in dotted lines in Fig. 15. The clamp 50 and cutter 51 meanwhile return to the lower position, (shown in Fig. 13,) and in consequence of these combined movements the threads are laid over the holder 6, as shown in Fig. 13. These ends of the threads remain securely clamped while the seam is being made and are released only immediately before the cutter 51 comes into action, as described. The fact that said cutter is made of two members which receive the threads between them is of importance, inasmuch as the cutter itself will catch the thread ends when they are released by the clamp, and thus it becomes possible to cut the four ends of the threads close to the buttonhole—that is, the threads which lead to the beginning of the seam are cut together with those extending from the end of the seam.

Having described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a sewing-machine, the combination with a needle and a thread-guide arranged adjacent thereto, of a clamp for holding the thread leading to the beginning of the seam, a cloth-presser, a thread-cutter independent of the cloth-presser, and means for moving said cutter under the needle and the guide to cut the said thread between the fabric and the needle and the guide and also to cut the thread leading to the beginning of the seam.

2. In a sewing-machine, the combination with a needle and a thread-guide arranged adjacent thereto, of a clamp for holding the thread leading to the beginning of the seam, until the seam is finished, and then releasing the thread, a thread-cutter, and means for moving said cutter bodily under the needle and the guide to cut the thread between the fabric and the needle and the guide, said thread-cutter having two members arranged to catch and cut the thread released from the clamp.

3. In a sewing-machine, the combination with a needle and a thread-guide adjacent thereto, of a holder arranged to receive the thread portion which leads to the beginning of the seam, means to place the thread portion upon the holder, a cutter, and means to actuate said cutter to cut the thread portions which extend from the fabric to the said holder and to the needle and thread-guide respectively.

4. In a sewing-machine, the combination with a needle and a thread-guide adjacent thereto, of a holder arranged to receive the thread portions leading to the beginning of the seam, a clamp adapted to hold the end of the thread engaged by the holder, a cutter, and means to actuate said cutter to cut the thread between the fabric on one hand and the needle, guide and holder respectively on the other hand.

5. In a sewing-machine, the combination with a needle and a thread-guide adjacent thereto, of a holder arranged to receive the thread portions leading to the beginning of the seam, a clamp independent of the holder adapted to hold the end of the thread engaged by the holder, and a cutter located adjacent to the clamp and held to move therewith, to cut the thread between the fabric on one hand and the needle, guide and holder respectively on the other hand.

6. In a sewing-machine, the combination with a needle and a thread-guide adjacent thereto, of a holder arranged to receive the thread portions leading to the beginning of the seam, a clamp to hold the end of the thread engaged by the holder, and to release the thread at the end of the seam, and a cutter located below the clamp and held to move therewith, said cutter comprising two members arranged to catch between them the

thread released by the clamp and to cut the thread between the fabric on one hand and the needle, guide and holder respectively on the other hand.

7. In a sewing-machine, the combination with a needle and a thread-guide adjacent thereto, of a cloth-presser having a holder arranged to receive the thread portion leading to the beginning of the seam, a cutter arranged independently of the holder, and means to actuate said cutter to cut the thread between the fabric on one hand and the needle, guide and holder respectively on the other hand.

8. In a sewing-machine, the combination with a needle and a thread-guide adjacent thereto, of a cloth-presser, a holder arranged to receive the thread portion leading to the beginning of the seam, a clamp adapted to hold the end of the thread portion engaged by the holder, and a cutter independent of the presser and arranged to sever the thread between the fabric on one hand and the needle, guide and holder respectively on the other hand.

9. In a sewing-machine, the combination with a needle and a thread-guide adjacent thereto, of a cloth-presser, a holder arranged to receive the thread portion leading to the beginning of the seam, a clamp independent of the presser and adapted to hold the end of the thread engaged by the holder, and a cutter located adjacent to the clamp and held to move therewith to sever the thread between the fabric on one hand and the needle, guide and holder on the other hand.

10. In a sewing-machine, the combination with a needle and a thread-guide adjacent thereto, of a cloth-presser, a holder arranged to receive the thread portion leading to the beginning of the seam, a clamp adapted to hold the end of the thread engaged by the holder, and a cutter located below the clamp and held to move therewith, said cutter comprising two movable members arranged to catch between them and to sever the thread released from said clamp.

11. In a buttonhole-sewing machine, the combination with means for producing a seam, and a presser-foot, of a clamp independent of said presser-foot for holding that end of the thread which leads to the beginning of the seam, a cutter associated with said clamp and arranged to sever the said end of the thread, and means for operating the clamp to release the thread and then operating the cutter to sever the thread.

12. In a buttonhole-sewing machine, the combination with means for producing a seam, of a clamp for holding that end of the thread which leads to the beginning of the seam, means for actuating said clamp to release the thread and then seize it during each cycle of the machine's operation, a cutter arranged below said clamp and having two members constructed to catch between them the thread released by the clamp, and means for operating the cutter to sever the thread.

13. In a buttonhole-sewing machine, the combination with means for producing a seam, of a clamp for holding that end of the thread which leads to the beginning of the seam, a holder arranged to engage the thread between the fabric and said clamp, and a cutter for severing the thread between the fabric and said holder.

14. In a buttonhole-sewing machine, the combination with means for producing a seam, said means including a needle and a thread-guide, of a clamp for holding that end of the thread which leads to the beginning of the seam, a holder arranged to engage the thread between the fabric and the clamp, a cutter for severing the thread between the fabric and said holder, and means for causing the needle and guide, after the severing of the thread, to pass from one side of the holder to the other, to place the thread on said holder.

15. In a sewing-machine, the combination with a thread-guide and means for operating it, of a clamp for holding and positioning that end of the thread which leads to the beginning of the seam, and a holder arranged to engage the thread between the fabric and said clamp.

16. In a sewing-machine, the combination with a thread-guide, of a clamp for holding that end of the thread which leads to the beginning of the seam, a holder arranged to engage the thread between the fabric and said clamp, and means for causing said guide to pass from one side of the holder to the other so as to place the thread on said holder.

17. In a sewing-machine, the combination with stitching mechanism and a thread-guide of a clamp and means to actuate said clamp automatically to seize and hold the thread carried by the thread-guide in position on the fabric before the seam is started.

18. In a sewing-machine, the combination of sewing mechanism and a thread-cutter with means to support said cutter movably, means to guide it in a helical path into operative position, and means for actuating said cutter, substantially as described.

19. In a sewing-machine, the combination with stitching mechanism of a thread-cutter comprising two blades adapted to pass on either side of a thread to be cut, means to support said cutter movably and guide it in a helical path into cutting position, and means for operating said cutter.

20. In a sewing-machine, the combination with stitching mechanism, of a support, means to give said support a vertical movement and a simultaneous oscillatory movement about a substantially vertical axis, an arm extending laterally from said support, and a thread-cutter supported from said arm.

21. In a sewing-machine, the combination

with an arm mounted to have an oscillatory movement, a cutter supported from said arm, a spindle mounted on said arm to operate said cutter, and provided with means tending to hold said cutter in closed position, and means to turn said spindle temporarily against the resistance of the holding means.

22. In a sewing-machine, the combination with a thread cutter and clamp and a vertically-movable shaft carrying the thread cutter and clamp, of means tending to force said shaft downwardly, means to rotate said shaft in its downward movement, and a locking means to temporarily hold said shaft in raised position.

23. In a sewing-machine, the combination with a work-support and sewing mechanism relatively movable, and a cutter mounted to have movement relatively to the sewing mechanism, of means operating independently of the sewing-machine mechanism to move the cutter to the sewing-thread, and means for controlling said operation in accordance with the position of said movable parts.

24. In a sewing-machine, a movably-mounted cutter, means comprising a spring tending to move the cutter into operative position, and means to control the operation of said cutter-moving means.

25. In a sewing-machine, the combination with a work-support and sewing mechanism relatively movable, and a cutter mounted to have movement relatively to the sewing mechanism, of means comprising a spring tending to move the cutter into operative position, and mechanism controlled in accordance with the position of said movable parts to hold and release said cutter.

26. In a sewing-machine, the combination with a needle and an arm adapted to carry the needle, of a standard supported independently of the arm and projecting upwardly from the frame of the machine, thread-cutting mechanism pivotally mounted on said standard, and means for swinging said cutting mechanism to bring the cutter beneath the needle.

27. In a sewing-machine, the combination with sewing mechanism, of an arm adapted to carry said mechanism, means to support said arm movably, and thread cutting and clamping mechanism supported independently of said arm and controlled by the movement of said arm.

28. In a sewing-machine, the combination with a work-support and sewing mechanism supported above said work-support, of a thread-cutter comprising two blades, having meeting cutting edges, means to move said cutter laterally between the sewing mechanism and the work-support into substantially horizontal cutting position adjacent to said work-support, and means independent of the work-support to open and close said cutter in its movement.

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

AUGUST JEUDE.

Witnesses:
JEAN GRUND,
CARL GRUND.