

Nov. 3 1925.

1,560,282

A. B. MATTINGLY

ATTACHMENT FOR SEWING MACHINES

Original Filed Nov. 3, 1913 4 Sheets-Sheet 1

Fig. 1.

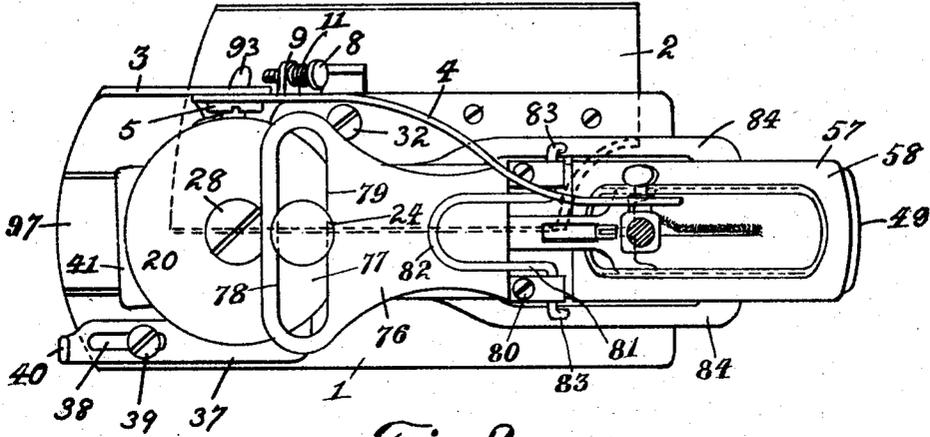


Fig. 2.

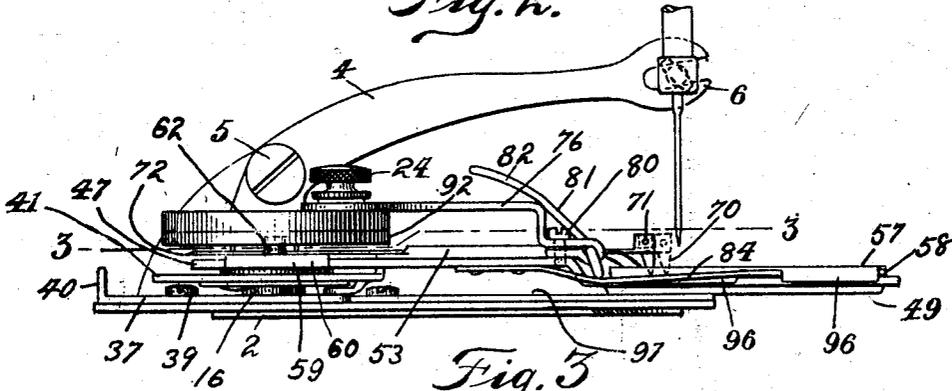
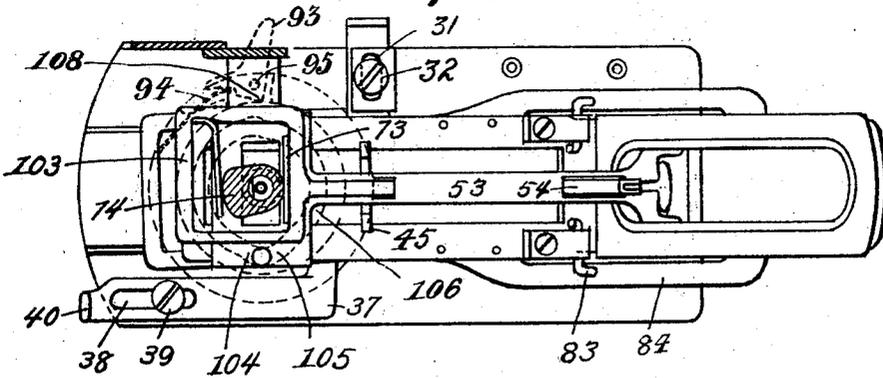


Fig. 3.



Witnesses:

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Nov. 3, 1925.

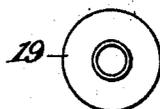
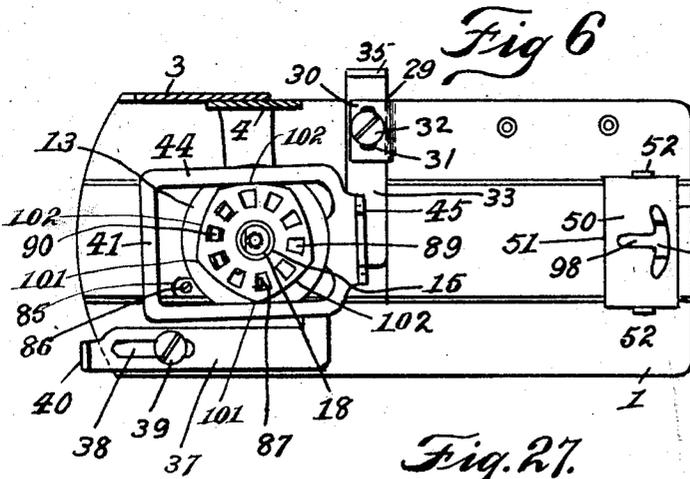
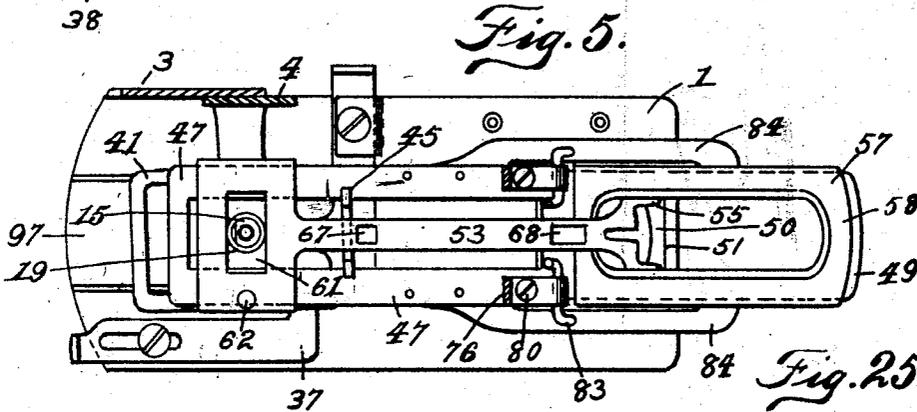
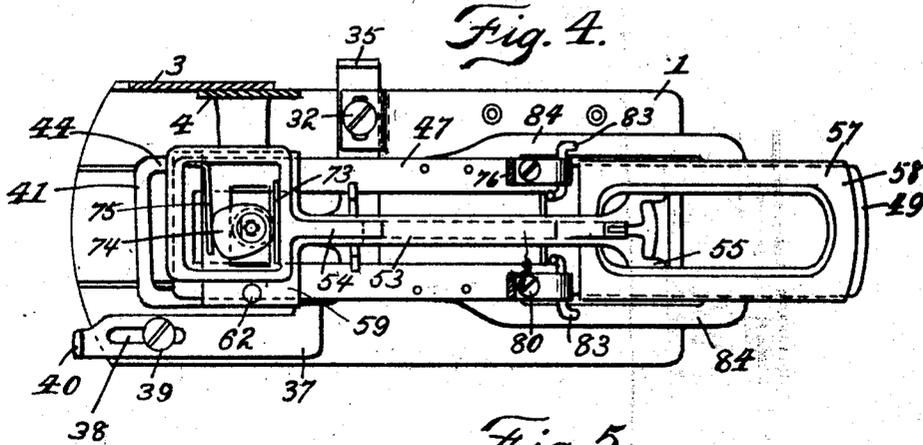
1,560,282

A. B. MATTINGLY

ATTACHMENT FOR SEWING MACHINES

Original Filed Nov. 3, 1913

4 Sheets-Sheet 2



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A. B. MATTINGLY

ATTACHMENT FOR SEWING MACHINES

Original Filed Nov. 3, 1913 4 Sheets-Sheet 3

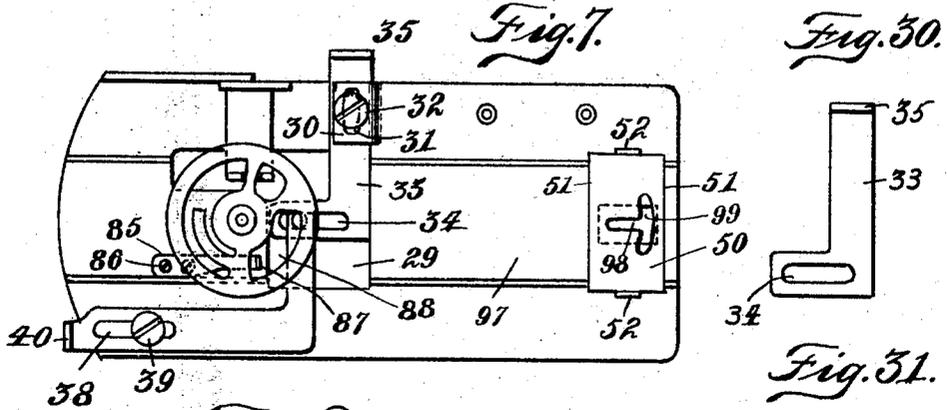


Fig. 30.

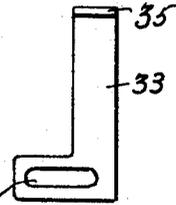


Fig. 31.

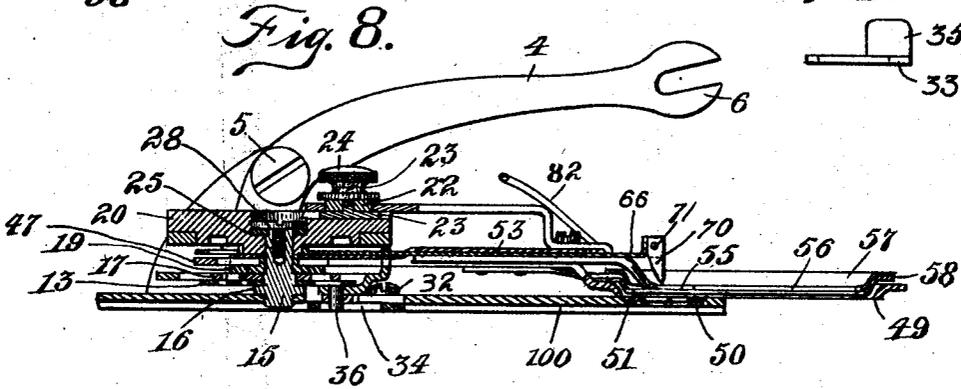
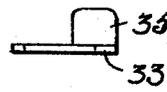


Fig. 9.

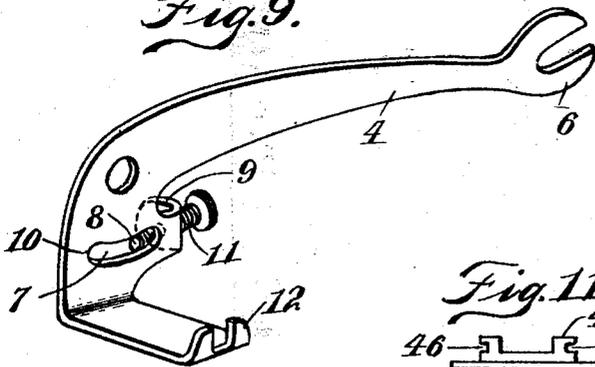


Fig. 10.

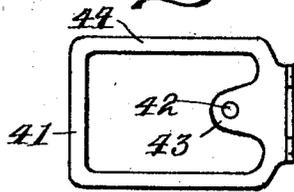


Fig. 11.

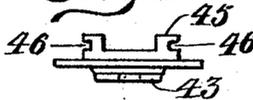


Fig. 12.

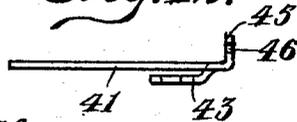
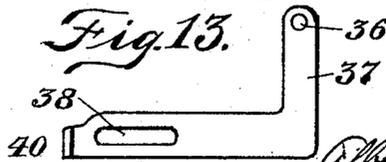


Fig. 13.



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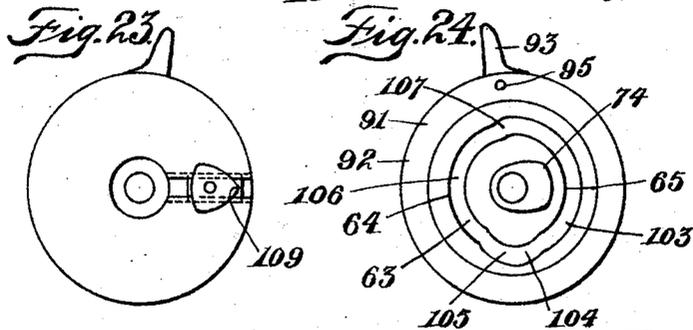
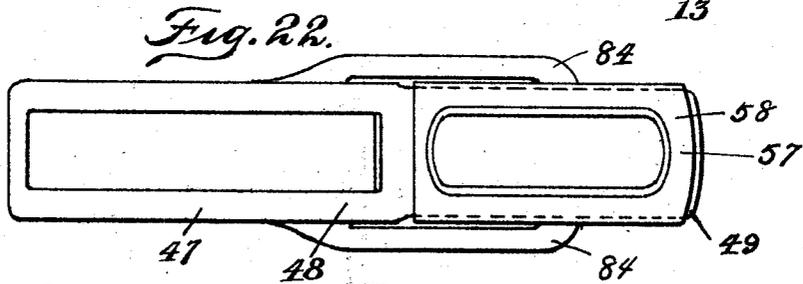
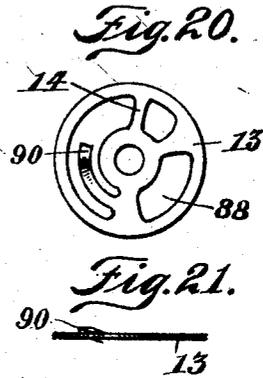
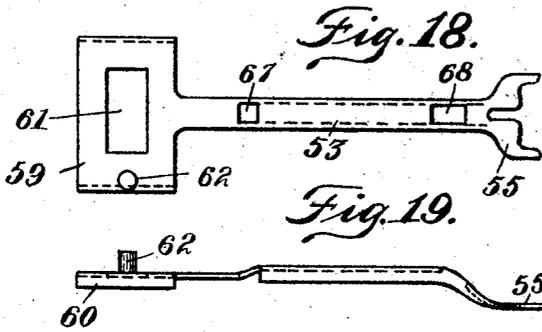
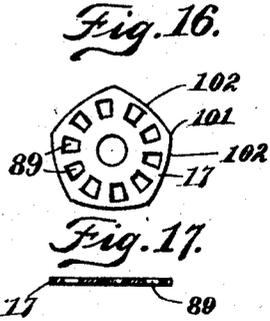
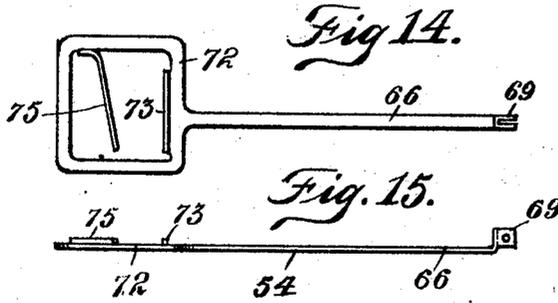
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A. B. MATTINGLY

ATTACHMENT FOR SEWING MACHINES

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UNITED STATES PATENT OFFICE.

ALBERTUS B. MATTINGLY, OF NEW YORK, N. Y.

ATTACHMENT FOR SEWING MACHINES.

Substitute for application Serial No. 798,972, filed November 3, 1913. Renewed December 20, 1919, Serial No. 346,433. This application filed September 10, 1923. Serial No. 662,004.

To all whom it may concern:

Be it known that I, ALBERTUS B. MATTINGLY, citizen of the United States, and resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Attachments for Sewing Machines, of which the following is a specification.

This invention relates to an improvement in attachments for sewing machines, and the inventor is aware that the device is of a nature similar to that disclosed in British Patent No. 17,153 of 1905, to Hills, and the United States Patent No. 990,610, to Turk, and the object is to overcome some of the objectionable features of these devices and to further improve the same.

This application is substituted for my prior application, Serial Number 798,972, filed November 3, 1913, and which was renewed December 20, 1919, Serial Number 346,433.

The principal objects are to provide a device of this character to automatically cut or slit the cloth just in advance of the stitching or binding of the button-hole so that the needle may pass alternately through the cloth and then through the slit or cut, thus causing the thread to be brought through the cut and make a perfect binding of the raw edges of the hole, and to provide a means for positively actuating the knife so as to give it a quick and decisive action at the proper periods to make the cut the proper length according to the length of the button-holes, and to have the length of cut automatically adjust itself with the adjusting of the device for the length of the button-hole.

The farther objects are to provide a device of this character which by its construction is considerably reduced in height and thereby doing away with the necessity of removing the face plate of the sewing machine to adjust the presser bar, and by the construction of the base plate obviating the necessity of removing the feed dogs of the sewing machine, (both of which things have to be done before the Hills or Turk devices can be attached to the machine).

The still further objects are to provide an improved ratchet device for effecting the lateral vibration of the work clamp, to produce the overstretch of the edge of the button-hole, and to form other parts of the de-

vice by the stamping process, and by screw-machines which are the cheapest methods of manufacturing devices of this class.

A still further object is to provide a device of this kind in which the knife can be adjusted to cut a line or slit in which the needle will follow with its inside lines of its vibrating motion on its forward movement and also perform the same function on its backward movement in forming or stitching the button-hole.

With these and other objects in view, it will be seen that I accomplish the foregoing, by referring to the accompanying drawings forming a part of this specification; but I do not wish to confine myself to the exact construction shown, as I have, for the sake of clear illustration, exaggerated some of the parts, especially in the side elevations.

In the accompanying drawings, showing one embodiment of my invention, Fig. 1 is a plan view of the device; Fig. 2 is a side elevation; Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2 and showing diagrammatically the operating cam friction drive or eccentric in dotted lines; Fig. 4 is a similar view to Fig. 3, showing more clearly the operating means for the knife; Fig. 5 is a similar view to Fig. 4 with the knife and its operating means removed; Fig. 6 is a similar view to Fig. 5 with the work clamp and knife guide and also the retaining washer removed, and showing the vibrating mechanism; Fig. 7 is a similar view to Fig. 6, showing a part of the vibrating mechanism removed and showing the pawl plate and the adjusting means for the knife, and the adjusting means for controlling the length of throw of the vibrator; Fig. 8 is a central vertical section of the device; Fig. 9 is a perspective view of the operating lever; Figs. 10, 11 and 12 are three views of the vibrator; Fig. 13 is a plan of the vibrator carrier; Figs. 14 and 15 are two views of the knife carrier; Figs. 16 and 17 are two views of the ratchet cam; Figs. 18 and 19 are two views of the shield for the knife carrier, and integral therewith the stripper plate for the needle, and the guide for the work clamp; Figs. 20 and 21 are two views of the pawl plate for operating the ratchet cam; Fig. 22 is a plan of the work clamp; Fig. 23 is a top plan of the eccentric operating mechanism, showing the adjustable eccentric cam; Fig. 24 is a bot-

tom plan of the eccentric operating mechanism, showing the knife cam and the race cam for operating the work clamp for forming the contour of the button-hole when operated in conjunction with the eccentric cam; Figs. 25 and 26 are two views of the retaining washer; Fig. 27 is a plan of the friction washer or plate; and Figs. 28 and 29 are two views of the retaining stud or pivot; Figs. 30 and 31 are views of a detail.

I provide a suitable base plate 1, which is secured to a rear throat plate 2 of the sewing machine in any suitable manner, but preferably screwed thereto, as shown in Fig. 1 of the drawings.

The base plate 1 is provided with an ear 3, which is upwardly turned and carries the operating lever 4, which rocks on a pivot 5 formed of a large screw, the lever 4 being provided with a bifurcated end 6 which engages the shank of the screw of the tightening collar of the needle bar of the sewing machine. The lever 4 is further provided with an arc-shaped slot 7, through which passes the arm of the friction clutch, which receives its movement from the screw 8 in the ear 9 and the rear end 10 of the slot 7. The screw 8 is frictionally held from turning by the pressure of the spring 11 against its head and the ear 9. The lever 4 is further provided with an arm or extension which has an upturned bifurcated end 12, which operates the pawl plate 13 by the web portion 14.

The base plate 1 is further provided with a stud or pivot 15, which I have shown screwed into the base plate with its flange or enlargement 16 resting against the plate. Rotatably mounted upon the stud 15 and supported by the flange 16 is the pawl plate 13, (which is swung in an arc by the end 12 of the lever 4 in a forward and backward movement). Rotatably mounted upon the stud 15 and resting upon the pawl plate 13 is a ratchet cam 17, and above this, resting on a shoulder 18 of the stud 15, is the retaining washer 19, and then the eccentric disk 20 carrying the adjustable eccentric cam 22, which is held in position by a T-bolt 23 and lock nut 24. The top of the stud 15 is provided with a friction washer 25, which is prevented from turning by the flat 26 of the washer and the flat 27 of the stud. The friction is caused by the tightening of the screw 28 of the stud, which causes the washer to press the disk 20 against the retaining washer 19.

The base plate 1 is further provided with a cut away portion 29 having an ear 30 bent horizontally, and slightly above the bottom level of the base plate, passing through the slot 31 is a screw 32 into an L-shaped member 33 having a slot 34 and an upturned ear 35. The slot 34 is for receiving the bottom end of the pin 36 of the L-shaped mem-

ber 37, which is provided with a slot 38 for adjusting it upon the base plate 1 by the screw 39, and it is also provided with an upturned ear 40 for adjusting it while the screw 39 is loose. The pin 36 is tight in the member 37 and its upper end forms a pivot for the vibrator 41, which is connected thereto by the hole 42 in the ear 43, and when assembled the ear 43 is capable of passing under the pawl plate 13, while the yoke 44 straddles the ratchet cam and rests upon the pawl plate 13.

The vibrator 41 is provided with an upturned bifurcated ear 45, which has two notches 46 in which slides the rear yoke 47 (of the work clamp 48), which straddles the stud 15 and rests on the retaining washer 19, which working in conjunction with the slots or notches 46 keeps the forward part 49 of the work clamp in proper contact with the base plate 1 and prevents the bottom stripper plate 50 from leaving the slotted way 51 in the base as it is oscillated by the work clamp in connection with the ears 52.

Mounted upon the yoke 47 is the guide or shield 53 for the knife carrier 54, having its front end 55 in the form of a stripping plate which slides in a groove or space 56 formed by a plate 57, which is forced into the upper jaw 58 of the work clamp. The rear end of the shield 53 is enlarged, forming a guide 59 by means of the downwardly extending flanges 60 fitting the yoke 47, which moves back and forth relatively to the stud 15. The rectangular opening 61 is of a width equal to the diameter of the upper end of the retaining washer which passes through it and prevents the shield from moving back and forth but allows its rear end to be drawn laterally of the stud 15 in both directions by the pin 62 working in the cam groove 63 formed by the cams 64 and 65, (thus causing the vibrator to vibrate or oscillate the work clamp in the shape of a button-hole while the eccentric is moving the work clamp back and forth the length of the button-hole).

Mounted upon the guide 59 is the knife carrier 54, which has its spring portion 66 passing through the openings 67 and 68 of the shield 53. The spring portion 66 has its outer end bent upward, with two ears 69 forming a pair of jaws for the knife 70, which is held by a pin or screw 71. The rear end of the spring portion 66 is formed in a rectangular frame or yoke 72 having a flange 73 forming a cam face against which the cam 74 works, and the flexible portion 75 insures the keeping of the cam 74 and the cam face 73 always in contact.

The work clamp is provided with an eccentric yoke or member 76 having an elongated opening 77 in which works the adjustable eccentric cam 22 against the faces 78

and 79. (The revolving of the cam 22 around the stud 15 causes the work clamp to be moved back and forth relative to the needle.) The member 76 is secured to the work clamp 48 by means of screws 80, and the forward end is bifurcated and bent so as to form bearings for the locking member 81, which is formed of a bent wire having a central portion 82 which acts in the capacity of a hand lever to operate the two end portions 83, which act upon the spring extensions 84 (of the upper jaw 58) and which are riveted to the rear yoke 47 of the work clamp.

Mounted upon the base plate 1 (see Fig. 7) is a spring member 85, which is held in position by the screws 86 and has an upwardly extending portion 87, which extends through the opening 88 of the pawl plate 13 and into the holes 89 of the ratchet cam 17. This prevents the ratchet cam from being turned backwards by friction of the pawl 90 slipping out of any one of the holes 89 upon its backward movement after it has revolved the ratchet cam one tenth of a turn.

The eccentric disk is revolved by a friction device 91 consisting of a ring 92 carrying a friction dog 93 which turns on a pivot 95 and is held in its biting position by a spring 94. The operation of the friction device will be described later on.

The base plate is further bent or formed so as to have a raised portion 97 through the center thereof, upon which the bottom of the work clamp slides and on which is cut the channel or groove 51 for the stripper plate 50, which has an opening 98 somewhat in the shape of a T. Beneath the stripper plate 50 in the base plate is an opening 99 to allow the needle to perform its functions. The raised portion 97 forms a channel or groove 100, (see Fig. 8), which allows the free action of the feed dogs of the sewing machine and raises the device enough to permit the cutting of the cloth without the knife hitting the dogs on its downward stroke.

The operation of the device is very simple. The rear throat plate of the sewing machine is removed and the device is slipped in its place by the insertion of the throat plate 2 which is screwed to the device, and the shank of the screw, which holds the needle in position, passes into the bifurcated end of the lever 4.

To make a button-hole, the work clamp is set by moving the sewing machine until the extreme back position is reached. The lever 81 of the locking member 82 is then pressed forward, (that is in the direction of the needle), and forces the arms 83 backwards and thus relieves the pressure of the springs 84, which allows the jaws of the work clamp to open. The cloth is inserted between the

jaws and the lever 81 pushed back to its original position, thus causing the upper jaw to force the cloth down into the concave opening in the lower jaw, and at the same time the flanges 96 of the upper jaw prevent the slipping of the cloth on the lower jaw and thus causes the cloth to be stretched like a drum head. With the work clamp in this position the knife is in the dotted position shown in Fig. 2, and upon running the machine the needle bar strikes the top of the knife and forces it through the cloth each time the needle descends, until the work clamp is almost at its extreme forward position, when the cam 74 draws the knife back from under the needle bar, (as shown in full lines in Fig. 2), thus preventing further cutting, and the knife remains in this position until the button-hole is finished.

The pin 62 is the pivot center upon which the work clamp is oscillated by the vibrator 41. With each upward movement of the needle bar the lever 4 is raised, which in turn swings the pawl plate 13 sufficiently to have the pawl 90 enter one of the holes 89 of the ratchet cam and revolve it one tenth of a revolution, which causes one of the pointed cam faces 101 to act on one side of the yoke 44 and cause the vibrator to swing to one side on its pivot 36. The face 102 prevents any overthrow of the vibrator. The next stroke of the needle causes one of the faces 101 to act on the opposite side of the yoke 44 and swing it in the opposite direction. This movement of the vibrator causes the work clamp to be oscillated on its pivot 62, such motion being transmitted through the ear 45 of the vibrator. While the vibrator is oscillating the work clamp in one direction or the other with every stroke of the needle to make the needle pass first through the cloth and then through the cut, the eccentric cam is slowly shoving the work clamp forward the length of the button-hole, the speed of the forward movement being regulated by the screw 8, which strikes the arm 93 of the friction clutch and forces the ring 92 back a predetermined amount, (upon the downward stroke of the needle). The rear end 10 of the slot 7, upon reaching the arm 93, (on the upward movement of the needle), forces the ring to move forward and the nose 108 to bite into the eccentric disk 20 and cause the disk to revolve, which causes the point 109 of the cam 22 to act upon the face 79 of the member 76 and shove the work clamp forward, and when the face 109, on the last half of the revolution of the eccentric disk 20, works against the face 78 it causes the work clamp to be drawn backwards. The revolving of the eccentric disk 20 causes the pivot 62 to shift its position relatively to the ear 45 and the stud 15. On the first part of the

revolution of the disk 20 the pivot pin 62 is in that position of the cam groove 63 designated by the number 103, which causes the first straight part of the button-hole to be made. The parts 104 and 105 cause the pin 62 to first move further away from the stud 15 and then closer to the stud than it was at the start. (This causes the eyelet of the button-hole to be made), and the part 106, (causes the pin to stand still until the last straight part of the button-hole is finished), and the movement of the pin caused by the part 107 causes the two straight sides of the button-hole to be stitched together.

In order to make a large button-hole, the eccentric cam 22 is located out at the periphery of the disk 20, and the nearer the center of the disk 20 the cam 22 is located the smaller will be the button-hole; but no matter what the length of the button-hole is the knife will always move from under the needle bar at the same period of the operation of making the button-hole and be pushed under the needle bar at the starting point, so that the slot will always be the proper length. When a large button-hole is made its over-stitch should be of greater length than for a small one, so that by loosening the screw 39 and drawing the member 37 back it causes the ear 45 of the vibrator to be moved nearer to the pin 62 upon which the work clamp oscillates, and causes a longer throw of the work clamp, or by moving the member 37 forward the throw of the work clamp is decreased.

To line the device up with the needle of the sewing machine the screw 32 is loosened and the member 33 can be moved in either direction, thus carrying the pivot center of the vibrator to a position which will cause the knife to line up with the needle on the strokes which pass the needle through the cut.

I claim as my invention:

1. The combination with a frame and a work clamp mounted to reciprocate thereon and to vibrate laterally, of a stud, a ratchet cam mounted on the stud and having a central perforation and ten perforations in a circular series around the center, the periphery of the cam having five faces meeting to form five points, advancing means arranged to engage the cam at said perforations to turn the cam step by step, means connected to the work clamp and engaging said cam periphery to vibrate the work clamp, means for preventing any backward throw of the perforated cam, means for shifting at certain periods the work clamp relatively to its pivot so as to form a button-hole with an eyelet end, and means for adjusting the vibrator relative to the stud and needle.

2. The combination with a frame and a work clamp mounted to reciprocate thereon

and to vibrate laterally, of a stud, a ratchet cam mounted on the stud and having a central perforation and ten perforations in a circular series around the center, the periphery of the cam having five faces meeting to form five points, advancing means arranged to engage the cam at said perforations to turn the cam step by step, means connected to the work clamp and engaging said cam periphery to vibrate the work clamp, means for preventing any backward throw of the perforated cam, means for shifting at certain periods the work clamp relatively to its pivot so as to form a button-hole with an eyelet end, means for adjusting the vibrator relative to the stud and needle, and means for regulating the length of the button-hole.

3. The combination with a frame and a work clamp mounted to reciprocate thereon and to vibrate laterally, of a stud, a ratchet cam mounted on the stud and having a central perforation and ten perforations in a circular series around the center, the periphery of the cam having five faces meeting to form five points, and a pawl plate on said stud arranged to engage the cam at said perforations to turn the cam step by step, and means connected to the work clamp and engaging said cam periphery to vibrate the work clamp.

4. The combination with a frame and a work clamp mounted to reciprocate thereon and to vibrate laterally, of a stud, a ratchet cam mounted on the stud and having a central perforation and ten perforations in a circular series around the center, the periphery of the cam having five faces meeting to form five points, and a pawl plate on said stud arranged to engage the cam at said perforations to turn the cam step by step, means connected to the work clamp and engaging said cam periphery to vibrate the work clamp, and means for preventing any backward throw of the perforated cam.

5. The combination with a frame and a work clamp mounted to reciprocate thereon and to vibrate laterally, of a stud, a ratchet cam mounted on the stud and having a central perforation and ten perforations in a circular series around the center, the periphery of the cam having five faces meeting to form five points, and a pawl plate on said stud arranged to engage the cam at said perforations to turn the cam step by step, means connected to the work clamp and engaging said cam periphery to vibrate the work clamp, means for preventing any backward throw of the perforated cam, and means for shifting at certain periods the work clamp relatively to its pivot so as to form a button-hole with an eyelet end.

6. The combination with a frame and a work clamp mounted to reciprocate thereon and to vibrate laterally, of a stud, a ratchet

cam mounted on the stud and having a central perforation and ten perforations in a circular series around the center, the periphery of the cam having five faces meeting to form five points, and a pawl plate on said stud arranged to engage the cam at said perforations to turn the cam step by step, means connected to the work clamp and engaging said cam periphery to vibrate the work clamp, and means for shifting at certain periods the work clamp relatively to its pivot so as to form a button-hole with an eyelet end.

7. The combination with a frame and a work clamp mounted to reciprocate thereon and to vibrate laterally, of a stud, a ratchet cam mounted on the stud and having a central perforation and ten perforations in a circular series around the center, the periphery of the cam having five faces meeting to form five points, and a pawl plate on said stud arranged to engage the cam at said perforations to turn the cam step by step, means connected to the work clamp and engaging said cam periphery to vibrate the work clamp, means for preventing any backward throw of the perforated cam, means for shifting at certain periods the work clamp relatively to its pivot so as to form a button-hole with an eyelet end, and means for increasing or decreasing the overstretch or the lateral throw of the work clamp.

8. The combination with a frame and a work clamp mounted to reciprocate thereon and to vibrate laterally, of a stud, a ratchet cam mounted on the stud and having a central perforation and ten perforations in a circular series around the center, the periphery of the cam having five faces meeting to form five points, and a pawl plate on said stud arranged to engage the cam at said perforations to turn the cam step by step, means connected to the work clamp

and engaging said cam periphery to vibrate the work clamp, means for preventing any backward throw of the perforated cam, means for shifting at certain periods the work clamp relatively to its pivot so as to form a button-hole with an eyelet end, and means for adjusting the vibrator relative to the stud and needle.

9. The combination with a frame and a work clamp mounted to reciprocate thereon and to vibrate laterally, of a stud, a ratchet cam mounted on the stud and having a central perforation and ten perforations in a circular series around the center, the periphery of the cam having five faces meeting to form five points, and a pawl plate on said stud arranged to engage the cam at said perforations to turn the cam step by step, means connected to the work clamp and engaging said cam periphery to vibrate the work clamp, means for preventing any backward throw of the perforated cam, means for shifting at certain periods the work clamp relatively to its pivot so as to form a button-hole with an eyelet end, means for adjusting the vibrator relative to the stud and needle, and means for regulating the length of the button-hole.

10. In apparatus of the character stated, the combination of a base plate, a flanged stud fitted to said plate, a pawl-plate rotatable on said stud and supported by the stud flange and a ratchet cam rotatable on said stud and supported by the pawl plate, the annulus of said cam being made up of a series of arch faces meeting at points and the body of which is provided with an annular series of holes double in number.

Signed at New York, in the county of New York and State of New York, this 7th day of September A. D. 1923.

ALBERTUS B. MATTINGLY.