

June 10, 1924.

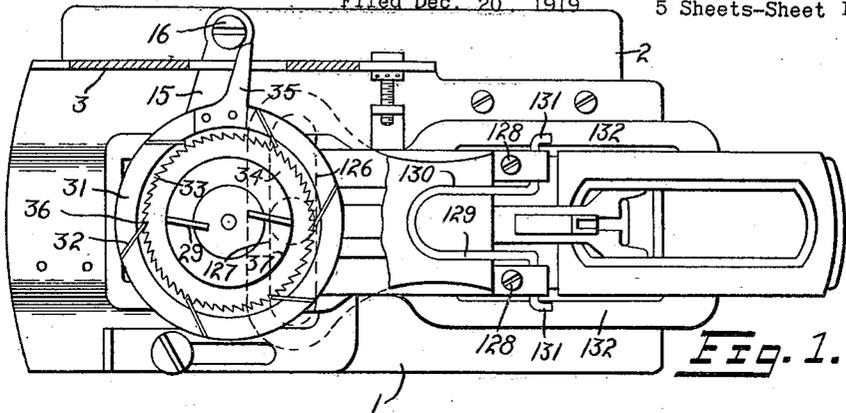
1,497,221

A. B. MATTINGLY

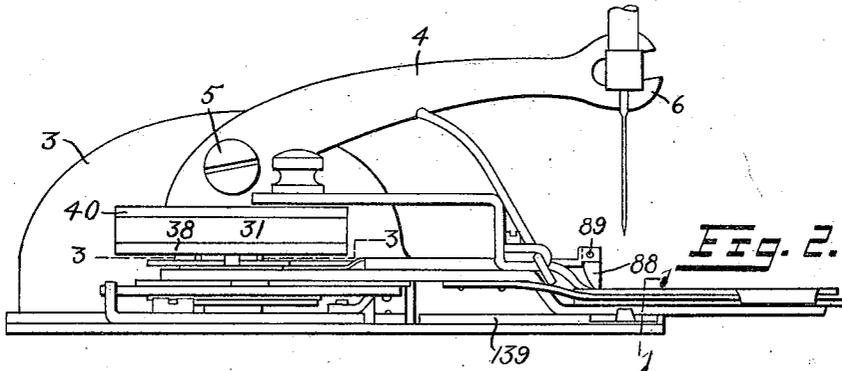
ATTACHMENT FOR SEWING MACHINES

Filed Dec. 20 1919

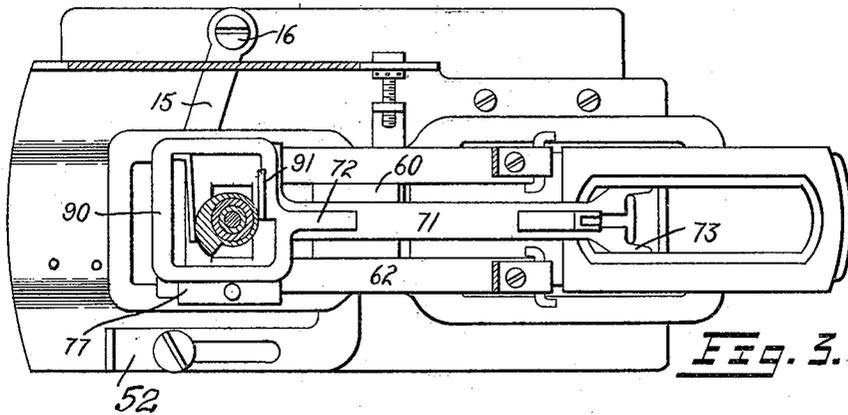
5 Sheets-Sheet 1



**Fig. 1.**



**Fig. 2.**



**Fig. 3.**

Inventor:  
*Alberus B. Mattingly*

June 10, 1924.

1,497,221

A. B. MATTINGLY

ATTACHMENT FOR SEWING MACHINES

Filed Dec. 20, 1919

5 Sheets-Sheet 2

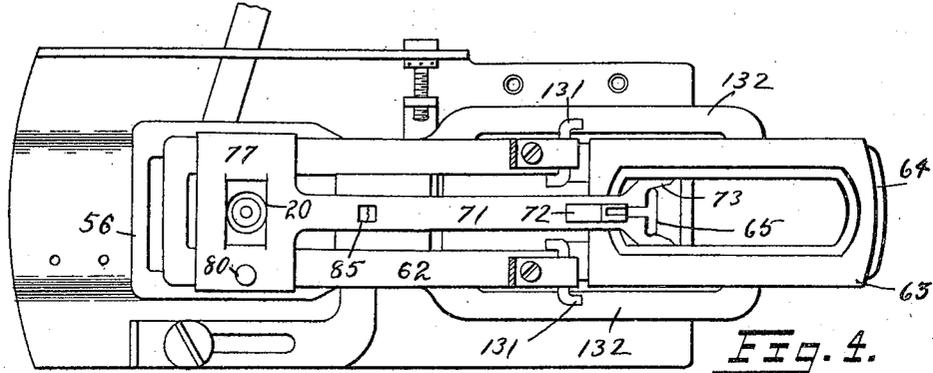


Fig. 4.

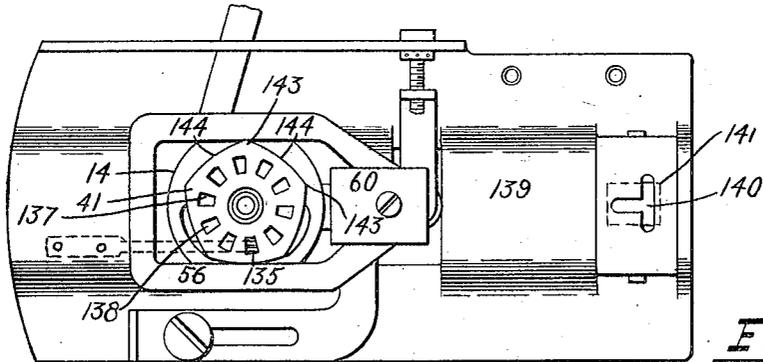


Fig. 5.

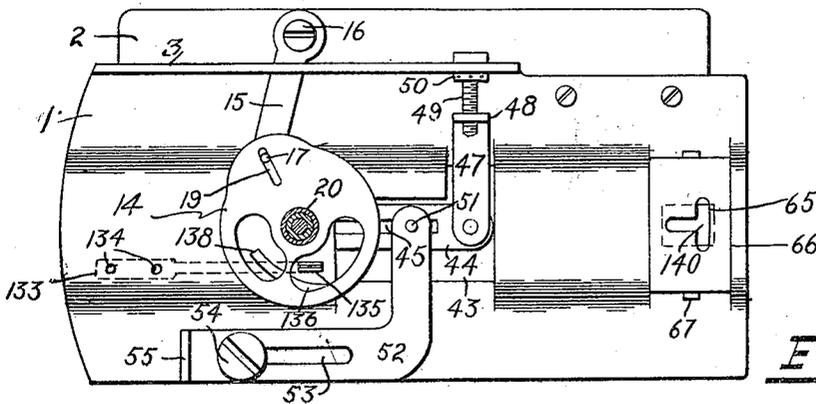
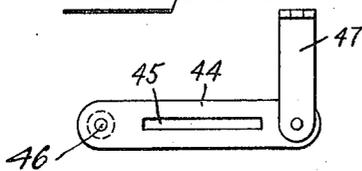


Fig. 6.

Fig. 37.



Inventor:  
*Albertus B. Mattingly*

June 10, 1924.

1,497,221

A. B. MATTINGLY  
ATTACHMENT FOR SEWING MACHINES

Filed Dec. 20, 1919 5 Sheets-Sheet 3

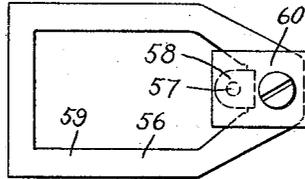
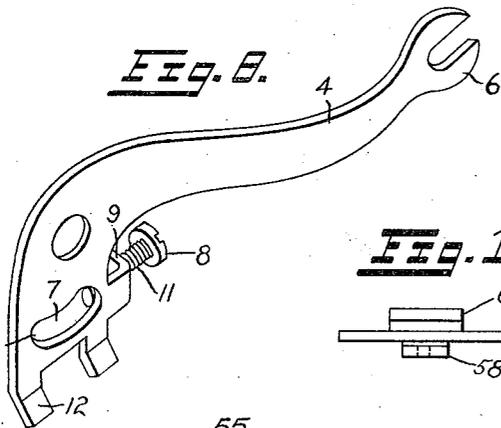
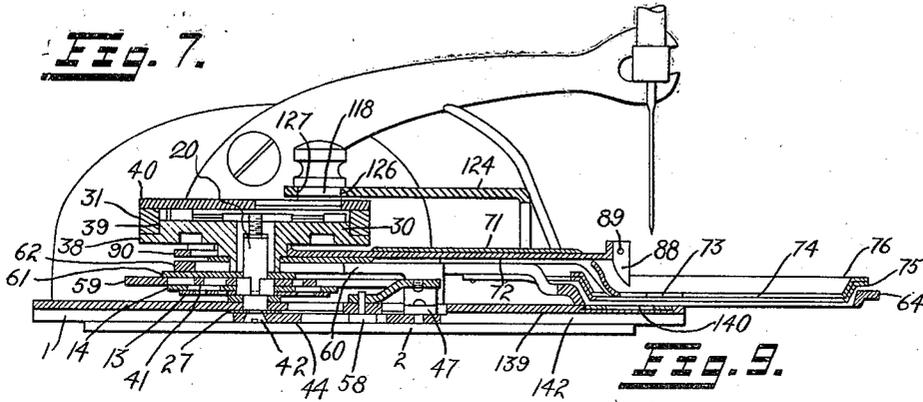


Fig. 10.

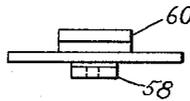


Fig. 11.

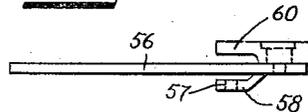


Fig. 13.

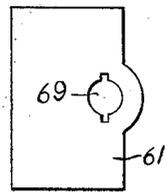
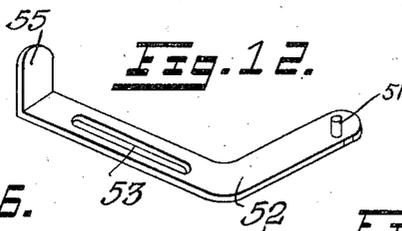


Fig. 26.

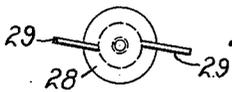


Fig. 28.



Fig. 27.

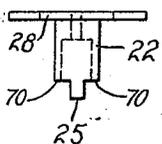
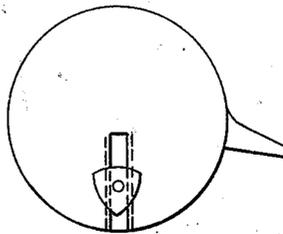
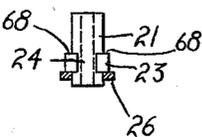


Fig. 29.



Inventor:  
*Albertus B. Mattingly*

June 10, 1924.

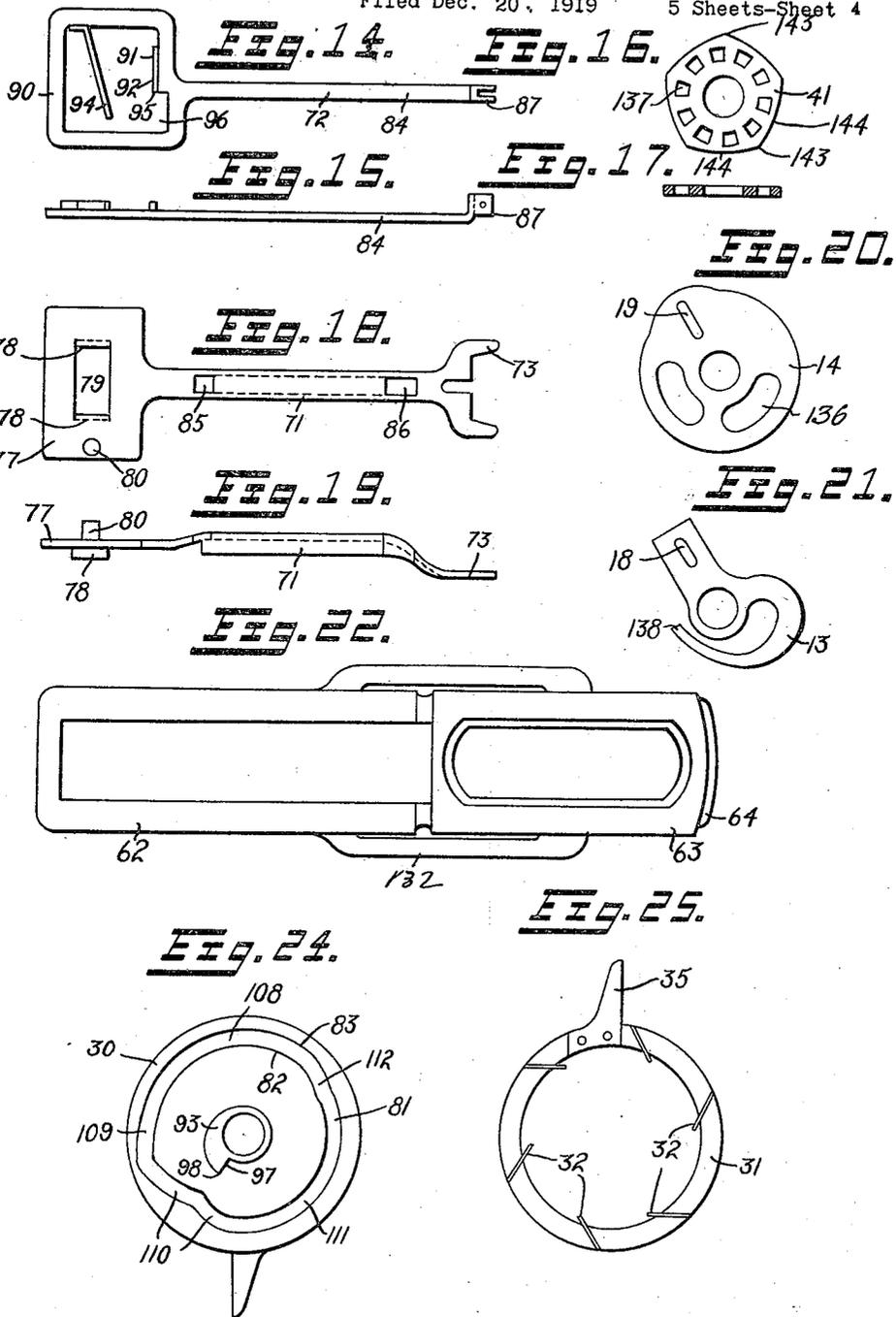
1,497,221

A. B. MATTINGLY

ATTACHMENT FOR SEWING MACHINES

Filed Dec. 20, 1919

5 Sheets-Sheet 4



Inventor  
Albertus B. Mattingly

June 10, 1924.

1,497,221

A. B. MATTINGLY

ATTACHMENT FOR SEWING MACHINES

Filed Dec. 20, 1919

5 Sheets-Sheet 5

Fig. 30.

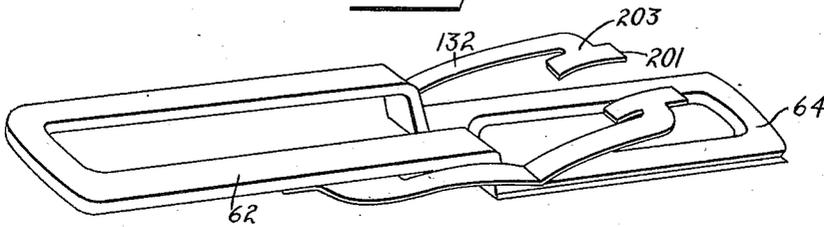


Fig. 31.

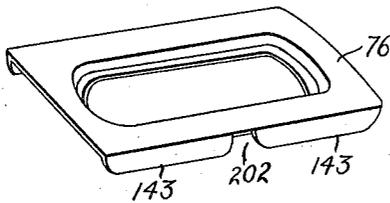


Fig. 32.

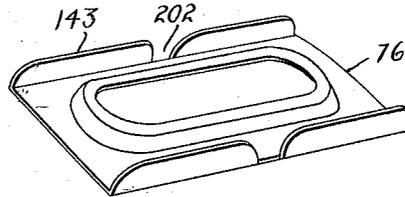


Fig. 33.

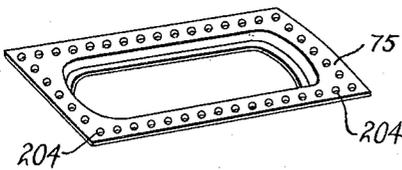


Fig. 34.

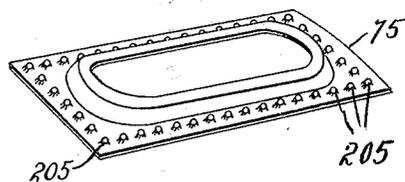


Fig. 35.

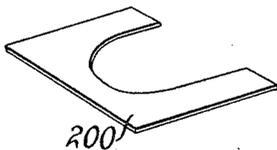
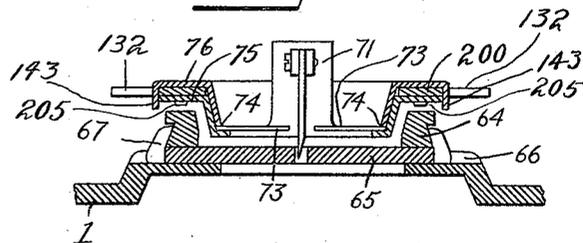


Fig. 36.



Inventor:  
Albertus B. Mattingly

Patented June 10, 1924.

1,497,221

# UNITED STATES PATENT OFFICE.

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

ATTACHMENT FOR SEWING MACHINES.

Application filed December 20, 1919. Serial No. 346,236.

*To all whom it may concern:*

Be it known that I, ALBERTUS B. MATTINGLY, a 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 Letters Patent No. 17,153 of 1905, to Hills, and United States Patents No. 412,081, to Fletcher, No. 446,746, to Fletcher, No. 990,601, to Seward, and No. 990,610, to Turck, and the object is to overcome some of the objectionable features of these devices and to further improve the same.

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 work, and to provide a means for positively actuating the knife with 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 further objects are to provide a device of this character which by its construction is considerably reduced in the cost of manufacture and to simplify the mode of assembling, and to provide a more efficient work clamp for holding the fabric in which the button-hole is to be worked, especially when a thin or glossy fabric is to be worked upon.

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, and the cam faces of the yoke upon which the eccentric cam works.

In the accompanying drawings, showing one embodiment of my invention, Figure 1 is a plan view of the device, partly broken away; Fig. 2 is a side elevation; Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2, showing more clearly the operating means for the knife; Fig. 4 is a similar view to Fig. 3, with the knife and its operating means removed; Fig. 5 is a similar view to Fig. 4 with the work clamp and knife guide and also the retaining washer removed and showing the vibrating mechanism; Fig. 6 is a similar view to Fig. 5, 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. 7 is a central vertical section of the device; Fig. 8 is a perspective view of the operating lever; Figs. 9, 10 and 11 are three views of the vibrator; Fig. 12 is a perspective of the vibrator carrier; Fig. 13 is a plan of the retaining plate; 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, one of the pawl plate and one of the pawl 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 bottom 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; Fig. 25 is a detail plan of the driving ring which revolves the eccentric operating mechanism; Figs. 26 and 27 are two views of the upper part of the assembling stud; Figs. 28 and 29 are two views of the lower part of the assembling stud; Fig. 30 is a perspective view of the work clamp with the upper jaw removed; Fig. 31 is a perspective view showing the top of the upper plate of the upper jaw; Fig. 32 is a perspective of the underside of the

plate shown in Fig. 31; Figs. 33 and 34 are perspective views showing the upper and lower sides of the bottom plate of the upper jaw; Fig. 35 is a perspective view of one of the filler plates of the upper jaw; Fig. 36 is an enlarged sectional view taken on the line 1—1 of Figure 2 and showing only the parts adjacent to the line of section; Fig. 37 is a plan of the alining devices for the knife.

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 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 downward extension which has a bifurcated end 12 which operates the pawl 13 and the pawl plate 14 by the lever 15, which is mounted on the throat plate 2 by means of a body screw forming a pivot 16. In the forward end of the lever 15 is a pin 17 (see Figs. 6, 20 and 21), which operates the pawl 13 and the pawl plate 14 through the slots 18 and 19.

The base plate 1 is further provided with a pivot or stud 20 made up of two parts 21 and 22. The lower portion 21 of the stud is hollow and has its upper and lower ends turned down, leaving a body portion 23 which is slotted on opposite sides forming grooves 24 for the reception of the extensions 25 of the part 22, and a washer 26 is forced on to the lower part of the part 21. The washer 26 forms a substantial base for holding the stud in a vertical position on the base plate, which is done by the screw 42 passing through the washer 27 and the base plate 1 and the hollow part 21 and being screwed into the part 22, which locks all of the several parts assembled on the stud in position by its head 28, in which are secured two springs 29 which act as friction brakes in connection with the cam member 30, which is driven by a ring 31 having a series of spring members 32 varying in length, no two being the same length and their combined variation being slightly less than the length of one of the ratchet teeth 33 which they engage on the ratch 34 which is secured to the cam member 30. The ring 31 is further provided with an arm or extension 35

which passes through the slot 7 of the lever 4 and is to operate the ring 31, which is moved back by the screw 8 striking the arm on the downward stroke of the needle. This causes one of the spring members 32 to seat itself in the bottom of one of the ratchet teeth (as shown at 36) irrespective of how great or little the movement is which is imparted to the ring. The springs 29, acting as a brake on the surface 37, prevent the springs 32 from turning the cam member 30 backwards. The upward movement of the needle causes the rear of the slot 7 to cause ring 31 to be revolved forward the same amount which it was forced back by the screw 8, and the lost motion or time in which the rear of the slot takes to reach the arm 35 allows the needle to be fully withdrawn from the fabric before the work clamp moves and this allows the free movement of the work clamp. The plate 40 keeps the ring in position between itself, the flange 38 of the cam member 30 and has a bearing on the surface 39 of the cam member 30.

Rotatably mounted upon the stud 20 and supported by the washer 26 are the pawl 13 and the pawl plate 14, (which are swung in an arc by the end 12 of the lever 4 through the lever 15 and its pin 17 in a forward and backward movement). Rotatably mounted upon the stud 20 and resting upon the pawl plate 14 is a ratchet cam 41, which receives a step by step rotary movement from the upturned end 138 of pawl 13 extending through a slot in plate 14, and engaging in turn the notches 137 of ratchet 41, and which operates the vibrator 56 which has its support on the pawl plate and is pivoted on the pin 51 of the L-shaped member 52.

The base plate 1 is further provided with a cut-away portion 43 in which is located a linked member 44 having a slot 45 and a circular opening 46 which fits the head of the screw 42, which acts as a pivot. Secured to the forward end of the linked member 44 by a pivot is a link 47 with an upturned end 48, which is tapped for the screw 49 which passes through a hole in the ear 3 and is provided with a lock nut 50. By turning the screw 49 to pull or push the link 47, the slot 45 can be made to line up perfectly with the needle and the stud 20 and held in this position by the lock nut 50. The slot 45 is for receiving the bottom end of the pin 51 of the L-shaped member 52, which is provided with a slot 53 for adjusting it upon the base plate 1 by the screw 54, and it is provided with an upturned ear 55 for adjusting it while the screw 54 is loose. The pin 51 is tight in the member 52 and its upper end forms a pivot for the vibrator 56, which is connected thereto by the hole 57 in the ear 58, and when assembled the ear 58 is capable of passing under the pawl 13 and pawl plate 14, while the yoke 59 strad-

dles the ratchet cam 41 and rests upon the pawl plate 14.

The vibrator 56 is provided with a pivoted block 60 which fits the inner faces of the rear yoke 62 of the work clamp 63, which straddles the stud 20 and rests on the supporting plate 61, which, working in conjunction with the cam member 30, keeps the forward part 64 of the work clamp in proper contact with the base plate 1 and prevents the bottom stripper plate 65 from leaving the slotted way 66 in the base as it is oscillated by the work clamp in connection with the ears 67. The supporting plate 61 is held in position by resting on the shoulders 68 of the bottom part of the stud 21 which fits the hole 69 provided with the slots through which pass the extensions 25 of the upper part 22 of the stud 20 and prevent it from turning and causing the springs 29 to act as friction brakes on the cam member 30, for which the upper part acts as a journal. The screw 42 pulling down on the part 22 pinches the plate 61 between the shoulder 68 and the part 70 of the upper part 22 of the stud.

Mounted upon the yoke 62 is the guide or shield 71 for the knife carrier 72, having its front end 73 in the form of a stripping plate which slides in a groove or space 74 formed by a plate 75, which is forced into the upper jaw 76 of the work clamp. The rear end of the shield 71 is enlarged, forming a guide 77 by means of the downwardly extending flanges 78 fitting the yoke 62, which moves back and forth relatively to the stud 20. The rectangular opening 79 is of a width equal to the diameter of the upper part 22 of the stud 20, 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 20 in both directions by the pin 80 working in the cam groove 81 formed by the cams 82 and 83 on the under side of the cam member 30 (thus causing the vibrator to vibrate or oscillate the work clamp in a line following the contour of a button-hole while the revolving disk is moving the work clamp back and forth the length of the button-hole).

Mounted upon the guide or shield 71 is the knife carrier 72, which has its spring portion 84 passing through the openings 85 and 86 of the shield 71. The spring portion 84 has its outer end bent upward, with two ears 87 forming a pair of jaws for the knife 88, which is held by a pin or screw 89. The rear end of the spring portion 84 is formed in a rectangular frame or yoke 90 having a flange 91 forming a cam face 92 against which the cam 93 fixedly secured to the under side of the cam member 30 works, and the flexible portion 94 insures the keeping of the cam 93 and the cam face 92 always in contact. At a predetermined point the

flange 91 forming the cam face 92 is cut away or ends at 95, and the yoke is so formed at this point as to have a clearance space 96 to prevent the yoke frame from hitting the cam 93 when the flexible part 94 of the yoke causes the yoke and knife to move quickly back between the strokes of the needle and thus prevent the needle bar from striking the knife several times while it is being moved back from under the needle bar. This quick movement is caused by the cam 93, which holds the yoke forward for the proper time, having an abrupt drop 97, so that while it is revolving on the stud 20 the point 98 passes the point 95 on the cam 92. The point 98 is so formed as to not interfere with the point 95 and this allows the yoke to move back its full stroke at this point, which is accomplished on one of the upward strokes of the needle bar.

The work clamp 63 is provided with an eccentric yoke or member 124 having an elongated opening in which works the adjustable eccentric cam 118 against the faces 126 and 127. The revolving of the cam 118 around the stud 20 causes the work clamp to be moved back and forth relatively to the needle. The yoke member 124 is secured to the work clamp 63 by means of screws 128, and the forward end is bifurcated and bent so as to form bearings for the locking member 129, which is formed of a bent wire having a central portion 130 which acts in the capacity of a hand lever to operate the two end portions 131 which act upon the spring extensions 132 of the upper jaw 76 and which are riveted to the rear yoke 62 of the work clamp and carry the upper jaw of the work clamp, which is made up of two stamped pieces of sheet metal forming a top plate 76 and a bottom plate 75 which carry two filling plates 200 similar to the one shown in Fig. 35, so as to keep the two plates 75 and 76 apart and form an opening or space for the reception of the extensions 201 on the springs 132, which forms a loose or swivel connection between the upper jaw and the springs. It will be noted that the upper plate 76 has two downwardly extending flanges 143 which are slightly bent inwardly and cut away at 202 to allow for the neck 203 connecting the extension 201 to the spring 132. The reason for bending the flanges 143 inwardly is to have them form a locking means for the bottom plate 75, so that in assembling all that is necessary is to push the lower plate into position after the upper plate and fillers are on the springs 132. In order to make the upper jaw hold the goods securely from slipping, the lower plate is punched with a drawing die which punches instead of cutting and causes the series of small holes 204 to form burs or flanged rings 205 on the underside of the bottom plate. The plate is passed beneath a

surface grinder and burs or flanged rings 205 are all made the same length and smooth so as not to mar the fabric in which a button-hole is to be made.

5 Mounted on the underside of the base plate 1 (see Fig. 5) is a spring member 133, which is held in position by the rivets 134 and has an upwardly extending portion 135 which extends through the opening 136 of the pawl plate 14 and into the holes 137 of the ratchet cam 41. This prevents the ratchet cam from being turned backwards by friction of the end 138 of the pawl 13 slipping out of any one of the holes 137 upon its backward movement after it has revolved the ratchet cam one-tenth of a turn.

10 The base plate is further bent or formed so as to have a raised portion 139 through the center thereof, upon which the bottom of the work clamp slides and on which is cut the channel or groove 66 for the stripper plate 65, which has an opening 140 somewhat in the shape of a T. Beneath the stripper plate 65 in the base plate is an opening 141 to allow the needle to perform its functions. The raised portion 139 forms a channel or groove 142 (see Fig. 7) 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.

15 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 6 of the lever 4. When the attachment is first put on the machine the screw 54 and lock nut 50 are loosened and the screw 49 turned to bring the knife in line with the needle. The lock nut 50 is then tightened up. This holds the slot 45 in a perfect line with the needle and then the member 52 can be adjusted for any width of vibration for the work clamp. The screw 54 is then tightened and the attachment is ready for operation.

20 It will be understood that after the knife has been once adjusted for the needle the attachment can be removed if desired and put back without the knife being readjusted, and the vibrating movement of the work clamp can also be changed to take more or less bite when the attachment is adjusted to make a larger or smaller button-hole, without disturbing the adjustment of the knife.

25 To make a button-hole, the work clamp is set by moving the sewing machine until the extreme back position is reached. The lever 130 of the locking member 129 is then pressed forward (that is in the direction of the needle), and forces the ends 131 backwards and thus relieves the pressure of

the springs 132, which allows the jaws of the work clamp to open. The cloth is inserted between the jaws and the lever 130 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 143 and the bars or flanged rings 205 of the upper jaw prevent the slipping of the cloth on the lower jaw and thus cause the cloth to be stretched like a drum head. With the work clamp in this position the knife is in the 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 93 is at the point where the point or nose 98 passes the point 95 and the flexible portion 94 of the yoke causes the yoke to move swiftly back and draw the knife out of line with the needle bar before it has time to descend and strike it again, (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.

30 The stud 20 is the pivot by which the work clamp is oscillated by the vibrator 56. With each upward movement of the needle bar the lever 4 is raised, which in turn swings the pawl plate 14 sufficiently to have the pawl 138 enter one of the holes 137 of the ratchet cam and revolve it one-tenth of a revolution, which causes one of the pointed cam faces 143 to act on one side of the yoke 59 and cause the vibrator to swing to one side on its pivot 51. The face 144 prevents any overthrow of the vibrator. The next stroke of the needle causes one of the faces 143 to act on the opposite side of the yoke 59 and swing it in the opposite direction. This movement of the vibrator causes the work clamp to be oscillated on stud 20, such motion being transmitted through the block 60 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 118 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 extension 35 and forces the ring 31 back a predetermined amount for which the screw has been regulated and this causes one of the springs 32 to seat itself in the bottom of one of the ratchet teeth and upon the upward stroke of the needle bar the rear end 10 of the slot 7 engages the extension 35 and moves it forward the same amount which the screw had shoved it back and this causes the cam member 30 to be revolved and carry the eccentric disk 118

around with it which pushes the work clamp forward and back the length of the button-hole. The revolving of the cam member 30 causes the pivot 80 to shift its position relatively to the ear 58 and the stud 20. On the first part of the revolution of the disk 30 the pivot pin 80 is in that position of the cam groove 81 designated by the numeral 108, which causes the first straight part of the button-hole to be made. The parts 109 and 110 cause the pin 80 to first move further away from the stud 20 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 111 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 112 causes the two straight sides of the button-hole to be stitched together.

In order to make a large button-hole, the eccentric cam 118 is located out at the periphery of the disk 30, and the nearer the center of the disk 30 the cam 118 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 will 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 overstretch should be of greater length than for a small one, so that by loosening the screw 54 and drawing the member 52 back it causes the block 60 of the vibrator to be moved nearer to the stud 20 upon which the work clamp oscillates, and causes a longer throw of the work clamp, or by moving the member 52 forward the throw of the work clamp is decreased.

Certain parts of the present mechanism are not claimed herein, but are claimed in applications Serial No. 353,107; 353,108; 217,401; 218,076; 352,980; 336,256; 346,235 and 336,257.

What I claim is:—

1. In a device as set forth, a work holder comprising a frame having a series of holes with the margins extended to form flanges, the margin of the inner frame opening being also extended to form a flange, a supporting plate having a central opening flanged to engage the opening of said frame, and having two sides flanged to engage the margins of the said frame whereby to secure the plate and frame together, a carrier having a pair of arms with ears arranged to engage between the frame and the supporting plate.

2. In a device as set forth, a work holder comprising a frame having a series of holes with the margins extended to form flanges,

the margin of the inner opening being also extended to form a flange, a supporting plate having a central opening flanged to engage the opening of said frame, and having two sides flanged to engage the margins of the perforated frame whereby to secure the plate and frame together, a carrier having a pair of arms with ears arranged to engage between the clamping frame and the supporting plate, and a cam lever arranged to engage the said arms to depress them.

3. In a device as set forth, a work holder comprising a frame having a series of holes with the margins extended to form flanges, the margin of the inner opening being also extended to form a flange, a supporting plate having a central opening flanged to engage the opening of said frame, and having two sides flanged to engage the margins of the perforated frame whereby to secure the plate and frame together, a carrier having a pair of arms with ears arranged to engage between the frame and the supporting plate, and a clamping lever in the form of a loop having its ends extended to engage said arms whereby to swing the arms to depress them.

4. In a device as set forth, a work holder comprising a frame with the margins extended to form flanges, the margin of the inner frame opening being also extended to form a flange, a supporting plate having a central opening flanged to engage the opening of said frame, and having two sides flanged to engage the margins of the said frame whereby to secure the plate and frame together, a carrier having a pair of arms with ears arranged to engage between the frame and the supporting plate.

5. In a device as set forth, a work holder comprising a frame with the margins extended to form flanges, the margin of the inner opening being also extended to form a flange, a supporting plate having a central opening flanged to engage the opening of said frame, and having two sides flanged to engage the margins of the frame whereby to secure the plate and frame together, a carrier having a pair of arms with ears arranged to engage between the frame and the supporting plate, and a cam lever arranged to engage the said arms to depress them.

6. In a device as set forth, a work holder comprising a clamping frame with the margins extended to form flanges, the margin of the inner opening being also extended to form a flange, a supporting frame having a central opening flanged to engage the opening of said clamping frame, and having two sides flanged to engage the margins of the clamping frame whereby to secure the frames together, a carrier hav-

ing a pair of arms with ears arranged to engage between the clamping frame and the supporting frame, the said carrier having an extension in the form of a frame with  
5 a central opening and acting as a second supporting frame, and a clamping lever in the form of a loop having its ends extended

to engage said arms whereby to swing the arms to hold the clamping frame engaging the second supporting frame.

Signed at New York, in the county of New York and State of New York, this 4th day of December, A. D. 1919.

ALBERTUS B. MATTINGLY.