(Model.) 3 Sheets—Sheet 1.

E. S. YENTZER.

RUFFLER FOR SEWING MACHINES.

No. 274,077. Patented Mar. 13, 1883.

Fig 1.

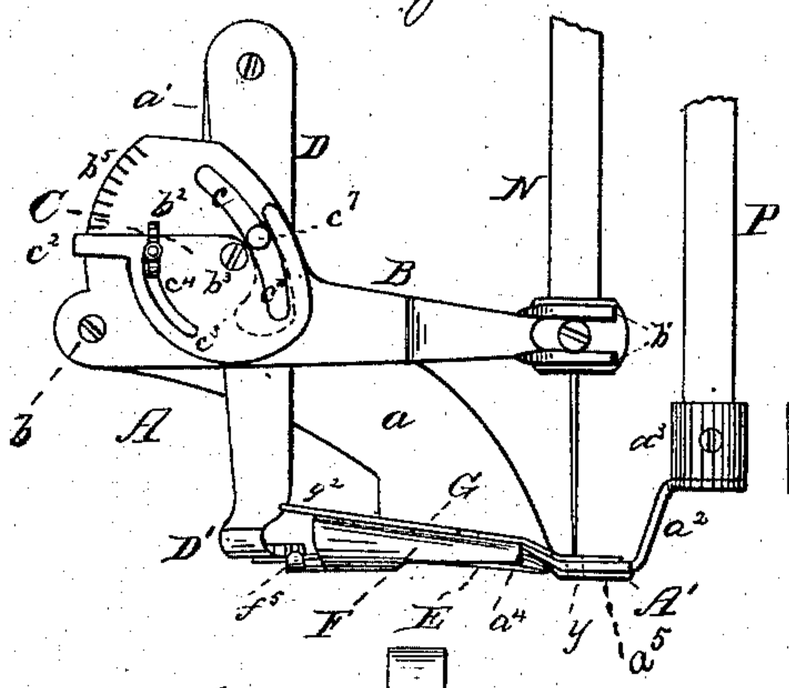


Fig. 2.

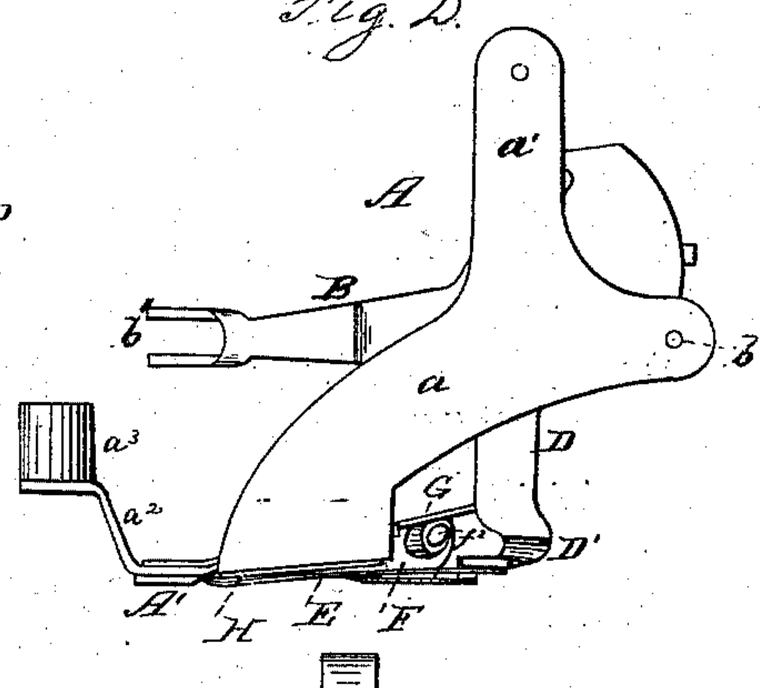


Fig. 3.

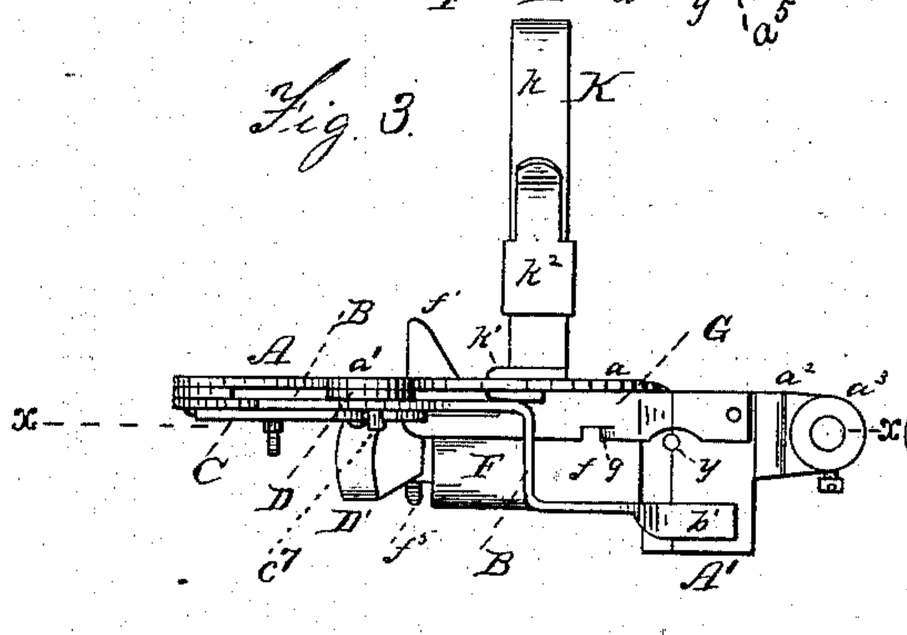


Fig. 4.

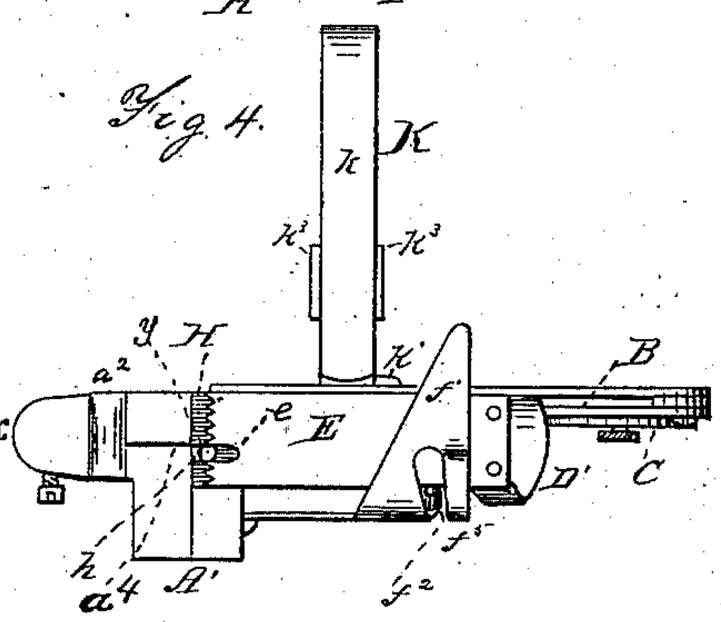


Fig. 5.

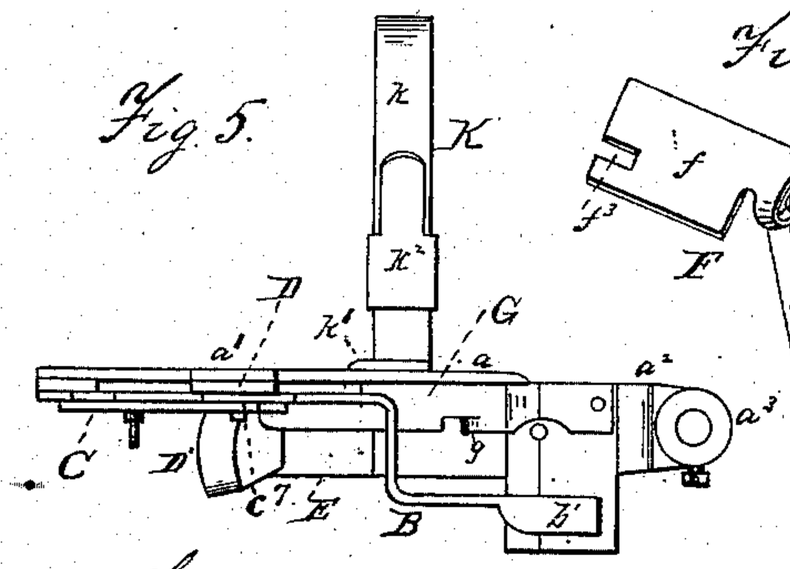


Fig. 8.

Fig. 6.

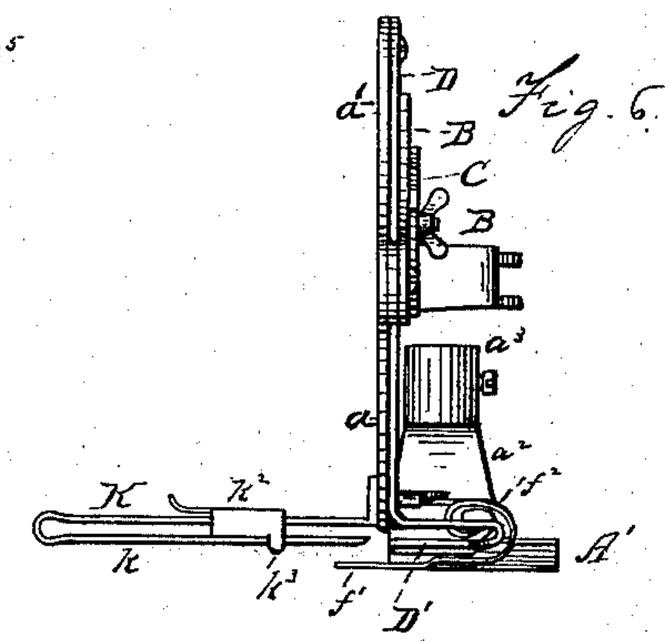


Fig 9

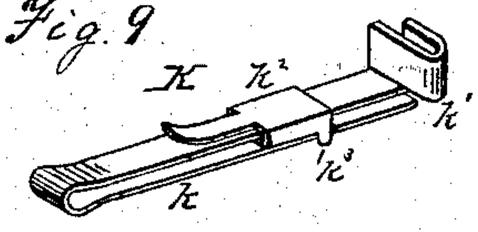
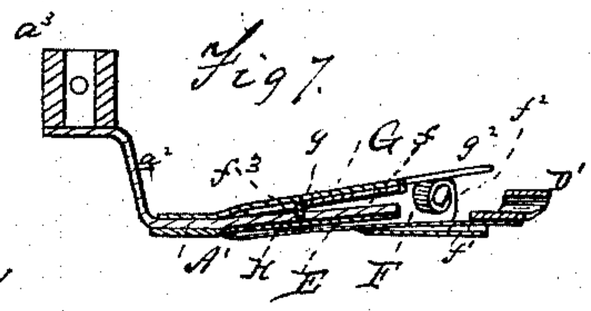


Fig 7.



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(Model.) 3 Sheets—Sheet 2.

E. S. YENTZER.

RUFFLER FOR SEWING MACHINES.

No. 274,077. Patented Mar. 13, 1883.

Fig. 10.

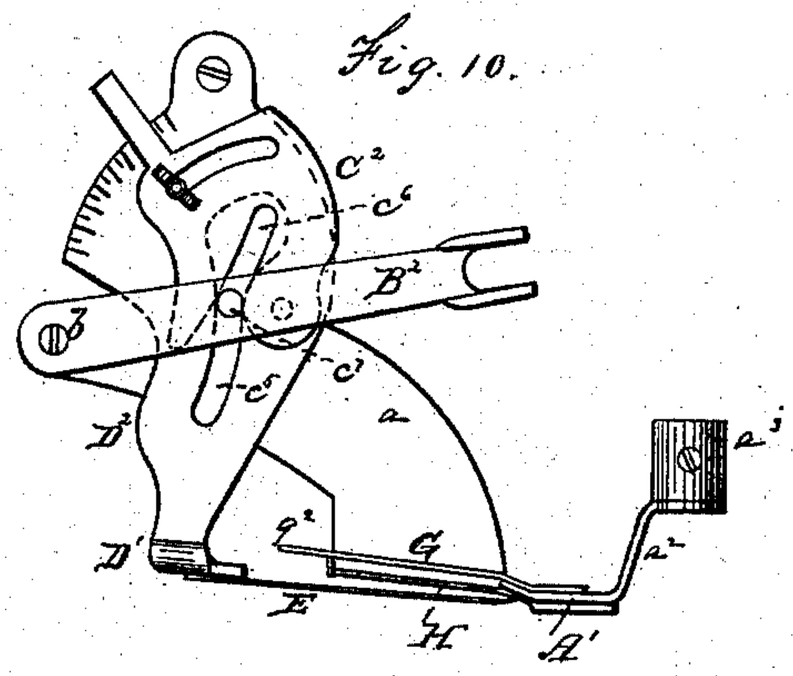


Fig. 11.

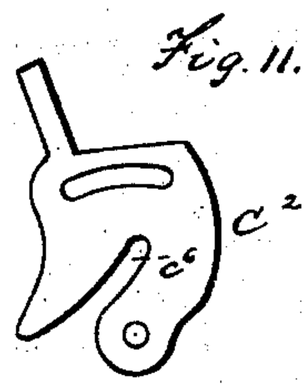
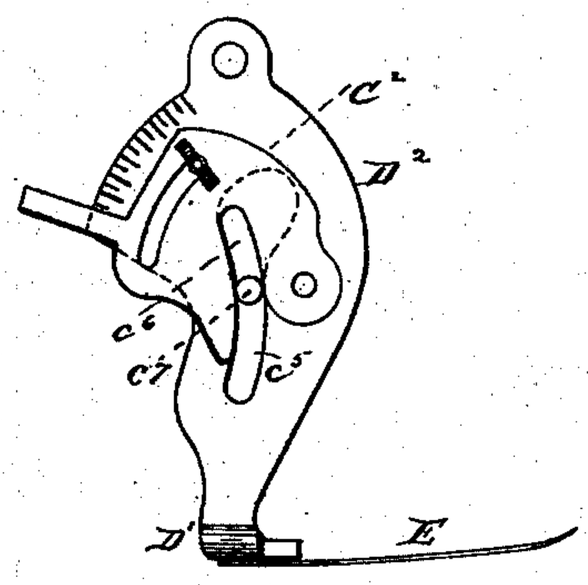


Fig. 13.

Fig. 14.

Fig. 12.



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(Model.)

3 Sheets—Sheet 3.

E. S. YENTZER.

RUFFLER FOR SEWING MACHINES.

No. 274,077. Patented Mar. 13, 1883.

Fig 16.

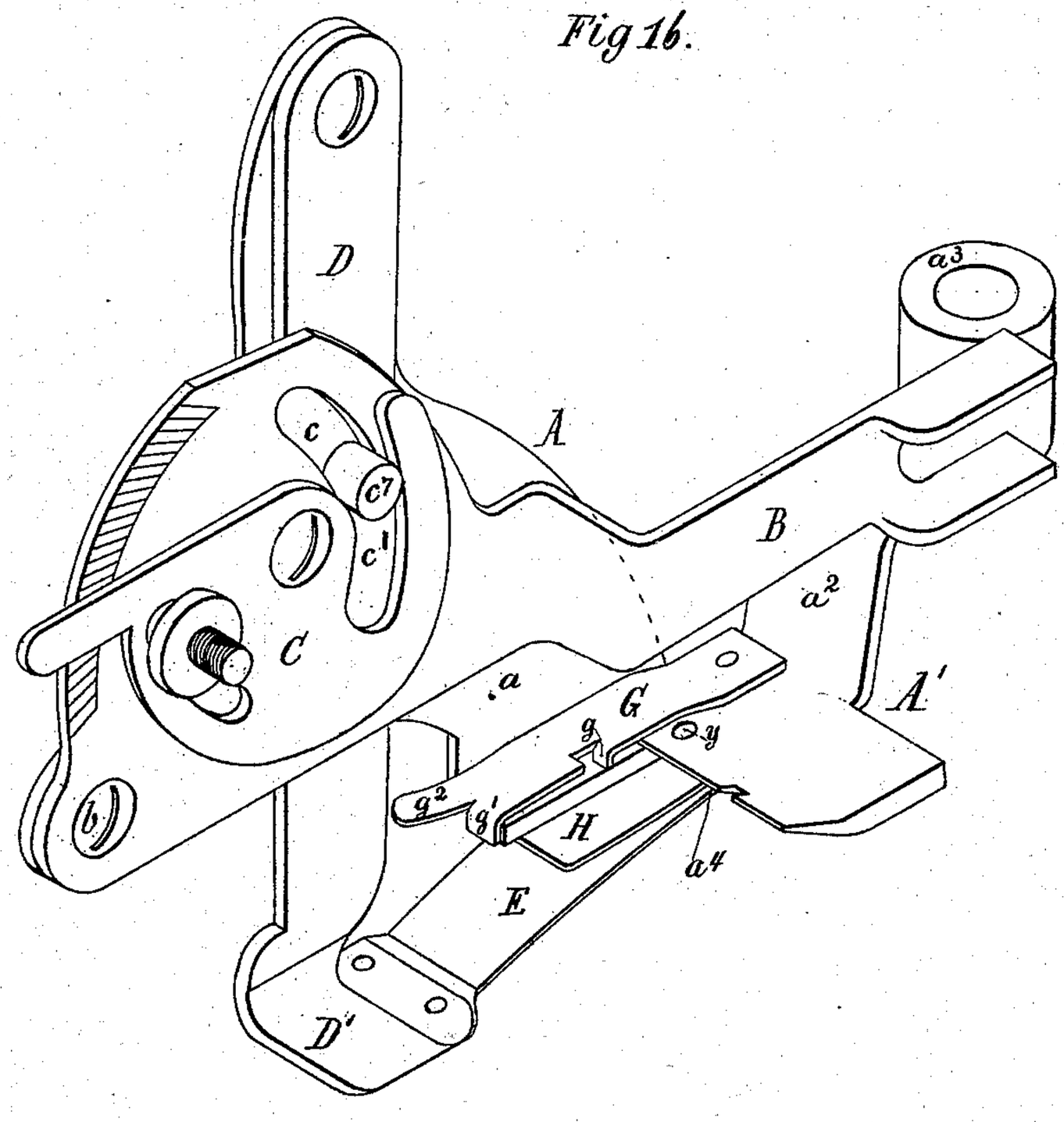


Fig 15.

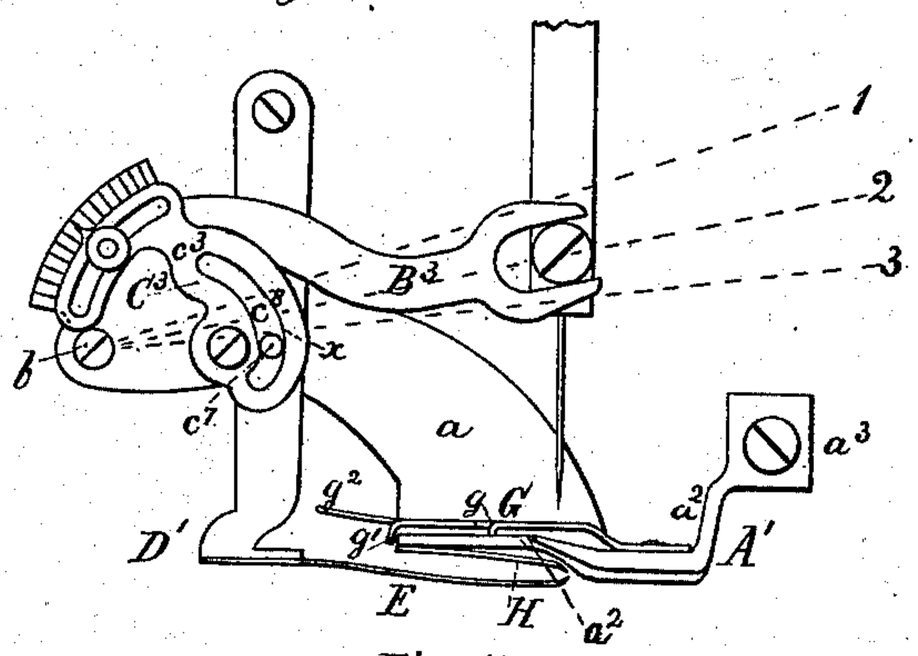
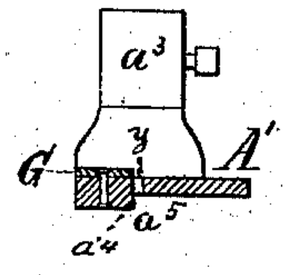


Fig 17



Witnesseses:
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Inventor:
Enoch S Yentzer
by his Atty
Fenwick & Lawrence

UNITED STATES PATENT OFFICE.

ENOCH S. YENTZER, OF OTTAWA, ILLINOIS, ASSIGNOR TO GEORGE W. YENTZER AND FRANK M. YENTZER, BOTH OF SAME PLACE.

RUFFLER FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 274,077, dated March 13, 1883.

Application filed August 23, 1882. (Model.)

To all whom it may concern:

Be it known that I, ENOCH S. YENTZER, a citizen of the United States, residing at Ottawa, in the county of La Salle and State of Illinois, have invented a new and useful Ruffler for Sewing-Machines, of which the following is a specification.

This invention relates to a ruffling attachment for sewing-machines, its main object being to form a ruffle and turn a finish over the ruffled edge at the same time the ruffle is being formed; and for this purpose a "turner" is attached to the foot of the ruffler, as will be hereinafter fully explained; and the nature of the invention will be understood from the following description, accompanying drawings, and claims.

In the accompanying drawings, Figure 1 is a right side elevation of a ruffling attachment constructed according to my invention. Fig. 2 is a left side elevation of the same. Fig. 3 is a top view, and Fig. 4 is a bottom view of the same. Fig. 5 is a top view with the finishing turner and guide removed. Fig. 6 is a front view. Fig. 7 is a section on the line *x x* in Fig. 3. Fig. 8 is a view of the removable finishing turner and guide detached. Fig. 9 is a detached view of the ruffle-guide. Fig. 10 is a view in elevation of a modification of my invention. Fig. 11 is a view of the modified ruffling-gage lever shown in Fig. 10. Fig. 12 is a view of the modified ruffle-blade-supporting lever and ruffling-gage lever connected together, shown in Fig. 10. Fig. 13 illustrates a modification of the operating-lever and gage-lever connected. Fig. 14 is a separate view of this modified operating-lever. Fig. 15 is a view illustrating the operation of the device shown in Figs. 13 and 14. Fig. 16 is a perspective view of the attachment with the "former" and guide removed; and Fig. 17 is a transverse section of the foot portion of the attachment, looking toward the needle-bar of the machine.

The letter A designates a frame composed of an oblique standard, *a*, having an upright arm, *a'*, and a foot portion, A', arranged to take the place of the presser-foot of a sewing-machine. From the rear edge of the foot portion an arm, a^2, projects upward, and is provided with a socket piece or collar, a^3, by which it may be secured to the presser-bar P. Through the foot A' is formed a needle-hole, *y*, and in front of the needle-hole the foot is narrowed, as shown at a^4, so as to have the edge of the narrow portion serve as a guide to the finish or binding, as will presently appear. At *b* an operating-lever, B, is pivoted to the standard *a* of the frame A, and is provided with a fork, *b'*, by which it may be engaged with a projection of the needle-bar N, as shown in Fig. 1. The lever B is widened, as shown at b^2, near its pivoted end, and in this widened portion is formed a curved slot, *c*, the upper portion and the rear edge wall of which are concentric with the pivot *b* of the lever. The lower portion of this slot is widened, as shown in dotted lines, Fig. 1, so that the front edge wall of this lower portion is not parallel with its opposite wall.

Upon the lever B is pivoted, at b^3, a plate-lever, C, which is the ruffle-gage lever. This lever C is provided with an eccentric open slot, *c'*, a handle, c^2, and a slot, c^3, through which passes a thumb-screw, c^4, by which the lever may be secured in any position to which it may be adjusted with relation to a scale, b^5, marked on lever B. The eccentric-slot *c'* of the lever C is arranged to form an adjustable continuation of the slot *c* in the lever B, the two slots thus forming a variable cam-slot, the lower portion of which may be given various positions to act as desired upon a pin, c^7, which projects through the slots of both levers from a lever, D, which is pivoted at its upper end to the arm *a'* of the standard *a*, and carries at its lower end a yoke, D', from the lower side of which the ruffling-blade E extends forwardly under the foot A'.

It will be readily observed that by adjusting the gage-lever C the stroke of the lever D, and consequently the width of the ruffles formed by the blade E, may be regulated as desired. The fabric to be ruffled is fed through the yoke D'. The ruffling-blade E is preferably formed of spring-steel, and has an open slot, *e*, formed in its front end, as shown in Fig. 4, which slot coincides with the needle-hole *y* when the ruf-

fling-blade is at the limit of its forward stroke, so that while a ruffle is held under the needle-hole the needle may pass freely through it and the slot *e* at the same time. I prefer also to serrate the front end of the ruffling-blade to facilitate its taking hold of the fabric.

To the under surface of the narrow portion a^4 of the foot A′ is secured, at one end, a thin spring or plate, H, of much greater width than the portion a^4 of the foot, by which the turn of the finish is prevented from coming in contact with the ruffle before it is stitched down, which will be hereinafter explained. The opposite free end of spring H extends under the needle-hole *y*, and in it is a slot, *h*, coinciding with the needle-hole *y* and slot *e*, in order that the needle may pass freely through it. This free end of the spring H is turned down slightly, so that it may assist the ruffling-blade E in making very fine ruffles, and also to engage the fabric and prevent any backward movement thereof as the ruffling-blade recedes. The under surface of the spring H may be finely corrugated, if desired, and the free end serrated.

Immediately in front of the needle-hole *y*, and upon the narrow portion a^4 of the foot A′, is supported a "finish" turner and guide, F. This turner and guide is preferably made of sheet metal, and consists of a plate, *f*, one edge of which rests against the standard *a*, a lateral extension or projection, f', which is bent under the plate *f*, and a turning-scroll, f^2, which projects in front of the right-hand portion of the plate *f*. From the right-hand end of the projection f' a small finger, f^5, curves slightly upward, for a purpose which will be presently explained. A spring, G, bears upon the upper surface of the plate *f* and holds the turner and guide against the foot A′, while it is held from lateral displacement by a tongue, *g*, (see Figs. 3, 5, and 15,) which projects from the spring through a slot, f^3, formed in the plate *f*, and into a hole formed in the narrow portion of the foot, as shown in Fig. 7. A portion of spring G is bent down to form a catch, g', (see Figs. 15 and 16,) which goes over the front edge of the plate *f*, and holds it in position. A portion of spring G, remaining straight, forms a handle, g^2, by which the spring may be raised to release the turner and guide. The scroll f^2 turns the upper edge of the "finish-strip" over the rough edge of the ruffle, while the under edge of said strip passes under the finger f^5, through the guide-slot formed by said finger f^5, and as the ruffle is being formed and the finishing-strip and ruffle are being moved forward by the feed of the machine both are stitched together.

The finger f', when the finishing-turner is in position, as shown in Figs. 1, 2, 3, 4, and 6, projects under and bears upon the under surface of blade E, and the binding material which passes under the small finger f^5 is thus held away from the blade E, and is not interfered with by the action of said blade. The scroll f^2 is sufficiently distant from blade E to prevent the binding and ruffling strips interfering with each other above the blade.

The wide portion of the foot A′ is cut away on its under surface, as shown at a^5, Fig. 17, in order that the heading turned under like a finish, resting on that portion of spring H which extends laterally beyond the narrowed part a^4 of foot A′, and passing under the wide portion of foot A′, can pass freely through, while the feed-dog of the sewing-machine may work with the best effect upon the fabric to which a ruffle is being sewed, notwithstanding the unequal thickness of the fabric under the foot.

The operation of the invention is as follows: When the handle of the gage-lever C is moved down to its lowest limit the entire cam-slot formed by the combined slots *c* and c' of the levers B and C is almost concentric with the pivot of lever B, and as this lever moves up and down the action of this cam-slot on pin c^7 will cause only a very small stroke of the lever D. When, however, the handle of lever C is carried up to the top of the scale b^5, the slot c' of this lever is inclined considerably rearward, so that when the lever B rises, and the pin c^7, left by the upper part of slot *c*, is struck by the front wall of slot c', the lever D will be moved rearward through a long stroke, the extent of the stroke being governed by the position of the lever C with respect to the scale b^5 on lever B. The longer the stroke the wider will be the ruffle formed, as greater will be the extent of fabric gathered up by the blade E. The whole movement of the lever D occurs when the pin c^7 is in the slot c', as the upper part of the slot c'—that is, the part above the pivot of the lever C—is concentric with the pivot *b* of operating-lever B, so that the movement of said lever has no effect upon the pin and lever D. When the needle-bar is at its highest position the lever D is thrown to the limit of its movement toward the back, and as the bar descends said lever is moved forward, carrying the ruffling-blade toward the needle-hole *y*, and when the operating-lever has descended until the pivot of lever C is even with the pin c^7, the blade E will have finished its stroke and placed a ruffle directly under the needle-hole and in the path of the descending needle, the slot *e* in the blade then coinciding with the needle-hole, and the front end of said blade projecting slightly beyond the same, so as to hold the ruffle in proper position to insure the passage of the needle through it. The blade now remains stationary during the further descent of the needle, and until it has risen clear of the fabric and formed a stitch through the ruffle, and then, as the needle rises farther to tighten the stitch, the lower part of the cam-slot, or the slot c', acts on the pin c^7 and throws the lever D rearward, so that the blade E will engage the fabric to form a new ruffle, which will be placed under the needle as it again descends. Thus it will be seen that each ruffle is stitched fast as soon as formed, and before either the feed or the

ruffling-blade moves, so that there is no possibility of disarrangement of the ruffles after they are once formed.

In practice, the finishing-strip is first placed in the finishing turner and guide F by slipping it under the ruffling-blade and above the projection f', around the yoke D′ into the turner, turning the upper edge into scroll f^2 to form the turn. Next, the lower edge of the finishing-strip is placed into the guiding-slot formed by finger f^5, and it is then drawn along until its end is a little to the rear of the needle-hole, and then the ruffle-strip is passed through the yoke D′ and between the ruffling-blade E and spring H, and its end placed under the needle-hole. The machine now being placed in operation with the feed and the stroke of the ruffling-blade properly regulated, the action of the parts in forming the ruffle will be as before explained, a finish on one edge being sewed on the ruffle.

To sew a plain ruffle to the edge of a fabric, the finishing-strip may be omitted, and the fabric may be fed between the finger f' and the ruffling-blade, its edge being simply guided but not turned by the former; or the ruffle may be sewed on at any distance from the edge by placing the fabric under the finger f'.

In case it is desired to sew a heading on one side of a ruffle under the edge of a finish, the turner, with guide F, is removed, the finish is placed on top of spring H and under the foot, then the ruffle-strip for the heading is introduced, as before.

If desired, a guide, K, as shown detached in Fig. 9, may be used to assist in controlling the ruffle-strip. This guide is composed of a longitudinally-doubled spring-metal strip, k, having at one end a spring-clamp, k', by which it may be attached to the front edge of the standard a, as shown in Figs. 3, 4, and 6. A spring-slide, k^2, embraces the upper arm of strip k, and has fingers k^3 k^3 extending across the edges of the lower arm. This guide K stands at right angles to the direction of the movement of the ruffle-strip, and its slide k^2 so fitted to the upper and lower portions of the metal strip k that it is held in position by friction. It is not necessary to employ the guide K, as the operation can be performed without it.

In the modification shown in Fig. 10 a straight operating-lever, B^2, with a pin, c^7, is adopted, and the ruffle-blade-supporting lever D^2 is provided with a slot, c^5, (shown partly in dotted lines,) the lower part of which is concentric with the pivot of lever B^2. The upper portion of slot c^5 is not concentric with the pivot b of lever B^2 until the gage-lever C^2 is moved down to its lowest limit, and when it is is moved upward the upper portion of said slot becomes eccentric to pivot b, the upper part of said slot being widened, as shown. The gage-lever C^2 is pivoted to lever D^2, and has an open slot, c^6, which is arranged to form a continuation of the lower part of slot c^5, and may be varied in position by adjusting the lever C^2. When the lever B^2 is performing the upper portion of its stroke the movement of lever D^2 is controlled by the slot c^6; but during the lower portion of the movement of the operating-lever the pin c^7 is in the concentric portion of slot c^5, and the ruffling-blade will remain at rest at full stroke forward.

In Figs. 13, 14, 15 another modified plan is shown, and this is used under the following circumstances: While I prefer forming the ruffle before the needle penetrates the cloth, as shown in Figs. 1 and 10, I find that there are some machines in which the stroke is so very short that the down portion thereof would hardly be practical with the parts constructed as in said Figs. 1 and 10. Hence it becomes necessary to provide the device shown in Figs. 13, 14, and 15, which, in fact, is the same thing substantially as that shown in Figs. 1 and 10, but reversed, and with the concentric portion of the slot made very short, from the fact that the eccentric acts upon the pin c^7 in the lever D from the lowest descent of the needle-bar until it nearly reaches its full height. In this modification (see Fig. 15) the operating-lever B^3 has pivoted to it a gage-lever, C^3, provided with a curved slot, c^8, into which projects a pin, c^7, from a straight ruffling-blade lever, D. (Same as is shown in Fig. 1.) The slot c^8 must be shaped to operate as follows: In Fig. 15 it will be seen that when lever B^3 is on dotted line 2 the pin c^7 is in a portion of the slot c^8 which is concentric with pivot b, the ruffle-blade at this stage having formed the ruffle. Now, pin c^7 runs in the concentric portion, while lever B^3 is carried up its full stroke to line 1 and returns again to line 2, and as slot c^8 is enlarged at x pin c^7 is allowed to move free of contact until lever B^3 gets down to line 3. Thus the ruffling-blade is allowed to remain at rest until the point of the needle penetrates the fabric, and next the pin c^7 comes in contact with the upper edge of the slot as the ruffling-blade is moved back to line 2. The position of lever C^3, as shown in Fig. 15, is for the longest stroke for a ruffle. Lever C^3 can be made with an open slot, as illustrated in Fig. 11.

From the foregoing specification it will be seen that the main object of the spring H is by its projection to the right of the narrow portion of the foot A′ to prevent the turn of the finish, as it is turned over the edge of the ruffle, coming in contact with the ruffle as it is being formed by the ruffling-blade working up against spring H, said spring vertically forming a part of the turner, and of course in that capacity the ruffling must work up against it; but if I should make a ruffle such as the ordinary rufflers do I would dispense with the spring H, and have the ruffling-blade to work against the smooth surface of the foot, or have the foot underneath finely corrugated. The cutting away of the foot underneath, so as to make it thinner in a vertical plane, as indicated at a^5 in the drawings, Fig. 17, and hav-

ing this thinned portion extend from the needle-hole and on the right side of said hole, allows the free passage of the finish turned over the ruffle, and this, together with the employment of the spring H, which projects laterally, as described, is a very important feature in an attachment for putting on a finish, or in successfully ruffling a heading under the edge of a finish.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the ruffle-forming devices, the finishing turner and guide, and the spring H, attached to the narrower part, a^4, of the foot A′, and projecting laterally on one side beyond said portion, and applied above the ruffling-blade E and below the turner and guide, and serving as an auxiliary to the finishing turner and guide, said spring, by means of its lateral projection beyond one side of the narrower part of the foot, preventing the turn of the finish from coming in contact with the material being ruffled below the spring, substantially as described.

2. The foot A′ of the frame A, narrowed, as at a^4, cut away, as at a^5, in combination with the spring H, finishing turner and guide, and ruffle-forming devices, substantially as and for the purpose described.

3. The combination, with the frame A, provided with the foot portion A′ and means for attachment to the presser-bar of a sewing-machine, of the pivoted lever carrying at its lower end the ruffling-blade, a pivoted operating-lever adapted for connection with the needle-bar of the machine, intermediate connections between said levers, and a gage-lever formed with a controlling-slot and arranged to act upon said intermediate connections to vary the stroke of the blade-supporting arm, substantially as described.

4. In a ruffling attachment, the combination of a pivoted ruffle-blade-supporting lever, a pivoted operating-lever adapted for connection with the needle-arm of a sewing-machine, and intermediate connections arranged to cause the ruffle-blade-supporting lever to lay a ruffle under the needle as the needle descends through the first portion of its downstroke and to remain stationary while the needle performs the latter part of its downstroke, and rises clear of the fabric, substantially as described.

5. The combination, with the frame A, having the foot portion A′ of the pivoted lever D, carrying the ruffling-blade, and slotted, as described, the operating-lever B, having a pin passing through said slot, and the pivoted gage-lever C, provided with a slot arranged to form a variable continuation of the slot in the blade-supporting lever, substantially as described.

6. The combination, with the frame A, having the foot portion A′ and means for attachment to the presser-bar of a sewing machine, of the pivoted ruffle-blade-supporting lever, the operating-lever provided with means of attachment to the needle-bar of a sewing-machine, a gage-lever, and the pin and variable slot-connections between said levers, substantially as described.

7. The combination, with the frame A, having the foot portion A′ and means for connection to the presser-bar of a sewing-machine, of the pivoted lever D, carrying at its lower end the yoke D′ and ruffling-blade E, the pivoted operating-lever B, and the gage-lever C, said levers being operatively connected by means of a pin and a variable slot, substantially as described.

8. The combination, with the ruffle-forming devices adapted to be operated with a variable stroke, of the springs G and H and the finishing turner and guide, which latter is, with the spring H, arranged to guide a finishing-strip along the ruffle and out of contact therewith, substantially as described.

9. The finishing turner and guide F, comprising the scroll f^2, with projection f', and finger f^5, in combination with ruffle-forming mechanism, and the spring G, having tongue g and catch g', substantially as described.

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Witnesses:
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F. M. YENTZER.