

(No Model.)

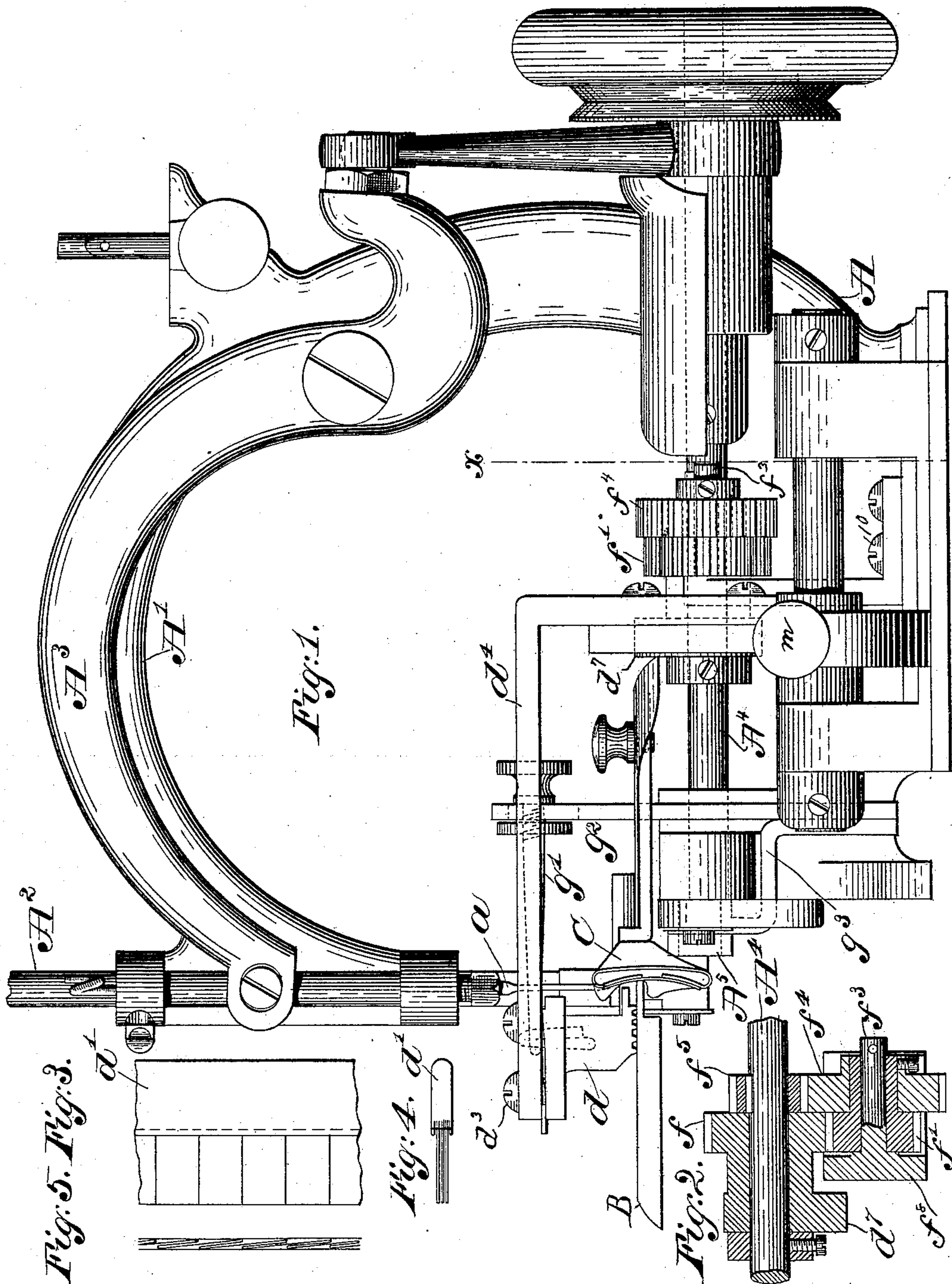
2 Sheets—Sheet 1.

O. M. CHAMBERLAIN.

RUFFLING MECHANISM FOR SEWING MACHINES.

No. 472,431.

Patented Apr. 5, 1892.



Witnesses.
Fred M. Ashworth.
Edward F. Allen.

Inventor:
Orange M. Chamberlain
by Crosby & Gregory Attys.

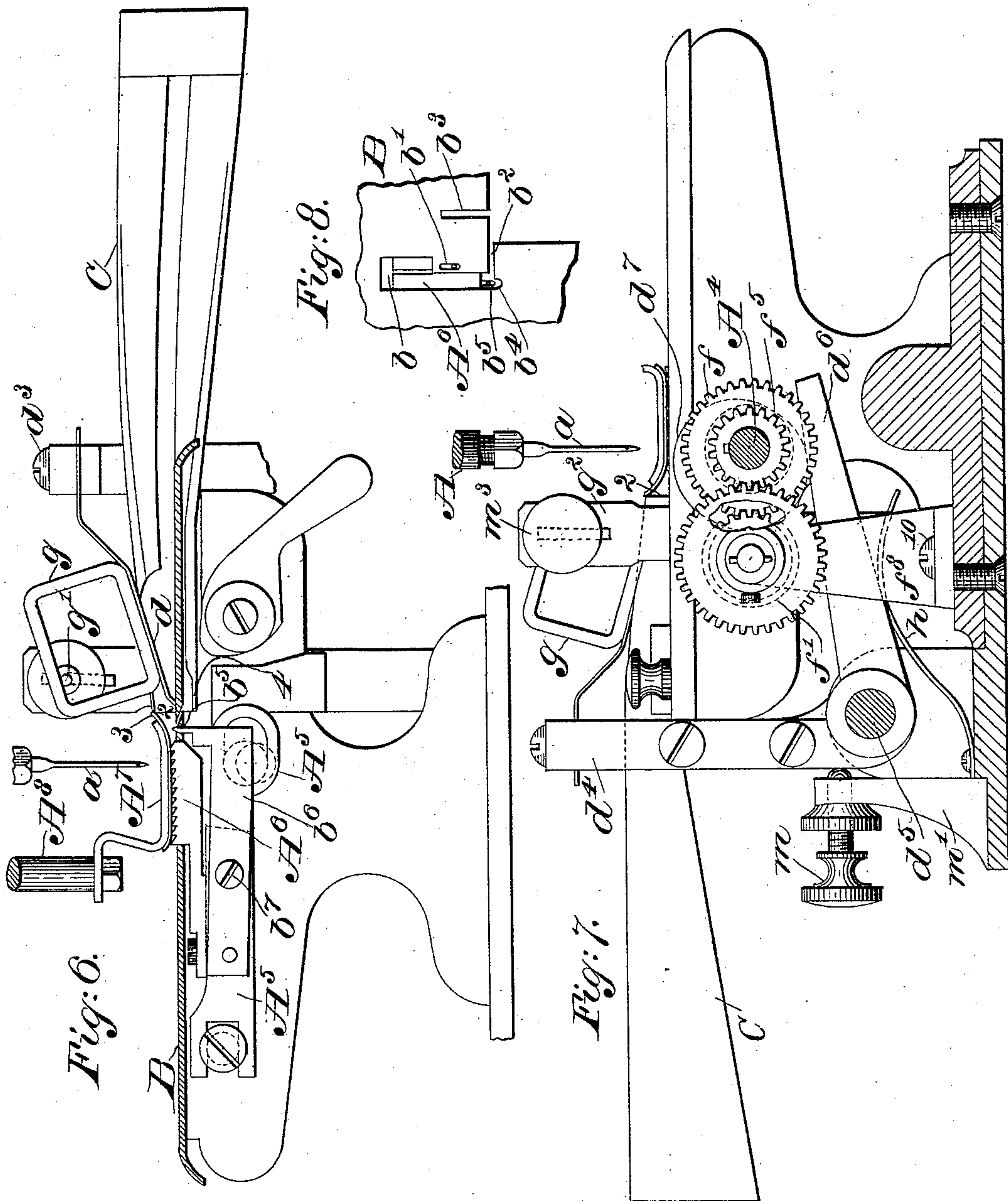
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UNITED STATES PATENT OFFICE.

ORANGE M. CHAMBERLAIN, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO
WHELOCK & BRIGHAM, OF SAME PLACE.

RUFFLING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 472,431, dated April 5, 1892.

Application filed October 26, 1891. Serial No. 409,813. (No model.)

To all whom it may concern:

Be it known that I, ORANGE M. CHAMBERLAIN, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Ruffling Mechanism for Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention has for its object to provide a simple and novel ruffling mechanism by which to ruffle and plait or gather a strip of material and stitch it in place between the edges of a folded band.

15 In this invention the strip to be ruffled rests upon the bed-plate of the sewing-machine and is acted upon by a ruffler-blade which is moved at the proper times by suitable actuating devices. The band is led through a guiding device substantially like a binder, one part of the guide—viz., that carrying the upper edge of the band—lying above the bed-plate, while the lower part of the said guide lies below the bed-plate. The bed-plate or cloth-plate of the machine is slotted just in advance of the feed-slot and the needle-hole and between the said feed-slot and the end of the ruffling-blade to permit the under half or edge of the band to come up through the slot in the bed or supporting-plate upon the surface thereof to be engaged by the feeding device, as will be described.

Figure 1 in side elevation represents a sewing-machine of the Willcox & Gibbs pattern and to which my improved ruffling mechanism is shown as applied. Fig. 2 is a partial longitudinal section taken in a horizontal plane through the main shaft of the machine and its attached gearing employed when the ruffling device is to be reciprocated out of time with relation to the needle movement, as when the plaits or ruffles are to be long, a number of the stitches being taken to each complete throw of the ruffler-blade. Fig. 3 shows in plan view a piece of ruffling such as may be made upon the machine to be herein described; Fig. 4, a cross-section of the said ruffling; Fig. 5, an edge view thereof. Fig. 6 is a partial front elevation of the machine shown in Fig. 1. Fig. 7 is a section to the left of the dotted

line *x*, Fig. 1. Fig. 8 is a detail showing a portion of the bed-plate or cloth-support with the feed-opening and needle-hole therein, the said figure also showing the slot through which rises the under edge of the band.

The frame-work A, having an overhanging arm A', the needle-bar A², having an eye-pointed needle *a*, the needle-actuating lever A³, the main shaft A⁴, the feed-bar A⁵, having a feed-dog A⁶, the presser-foot A⁷, and its carrying-bar A⁸ are and may be all substantially as in the Willcox & Gibbs machine, the said machine in practice having a suitable hook or loop-taker actuated by the main shaft A⁴ to co-operate with the eye-pointed needle and form stitches. I have omitted the hook from the drawings to avoid confusion of lines.

While I show the stitch-forming mechanism as of the Willcox & Gibbs pattern, this invention is not limited or intended to be limited to the exact form of the stitch-forming mechanism.

The bed-plate or cloth-support B has the usual feed-slot *b*, in which works the serrated portion of the feed-dog A⁶, and the said support also has a needle-hole, as *b'*, all as shown.

Aside from these openings the bed-plate is so cut away in front of the feed-opening referred to as to leave a slot, as *b*², which is substantially at right angles to the direction of the movement of the material with the feed, and I have also shown the said supporting-plate as provided with a second slot *b*³ to receive one end of the guide C, and preferably at the inner end of the slot *b*² I make an opening *b*⁴, through which may rise an auxiliary point *b*⁵, carried by a plate *b*⁶, herein represented as attached by a screw *b*⁷ to the regular feed-bar A⁵, the said auxiliary feeding-point moving in unison with the regular feeding-dog and engaging, and preferably penetrating, the material between the end of the feeding-dog and front end of the ruffling-blade *d*.

The guide C in cross-section represents an ordinary binding-guide of the so-called "Douglas" type, it being a metal guide shaped at its outer end to receive the band *d'* (see Figs. 3 and 4) in a substantially flat side, the guide being folded more or less upon itself toward its delivery end near the presser-foot to fold

the band upon itself, and preferably the guide will have its edges so shaped as to inturn the ends of the band, as represented in Fig. 4. The slot b^3 receives a medium portion of the guide, the upper portion of the guide terminating at 2, substantially in contact with the forward end of the upturned toe of the presser-foot or a plate 3, attached to the under side of the presser-foot. The under edge of the guide is extended forward under the bed-plate or cloth-support, as best shown in Fig. 6, and terminates at the point 4 quite close to the slot b^2 , so that the lower edge or half of the band may leave the said guide and be led up through the said slot b^2 between the forward or free end of the ruffling-blade d and the feeding device.

The material to be ruffled is laid upon the bed-plate or cloth-support and is acted upon directly by the ruffling-blade, and the under side of the band is in no way strained or interfered with, as is the case when the material to be ruffled rests upon a part of the band, and the ruffling-blade has to push the ruffled material forward over and in contact with a portion of the band. The ruffling-blade d , shaped in any usual manner at its forward end, preferably downturned and provided with teeth, is attached by suitable screws d^3 to one end of an elbow-lever d^4 , pivoted at d^5 , a horizontally-extended arm of the said lever, as d^6 , being acted upon by a suitable cam, as d^7 , actuated or timed to rotate at the desired speed, according to the number of stitches it is desired to make by the stitch-forming mechanism to each reciprocation of the ruffler-blade. In this present instance of my invention the cam d^7 is loose on the main shaft A^4 and the said cam has connected to or forming part of it a toothed gear f , which is engaged and rotated by a pinion f' , (shown by dotted lines in Fig. 7, full lines, Fig. 1, and in section, Fig. 2,) mounted loosely on a stud f^3 , parallel to the main shaft, the said pinion f' in this instance of my invention having an elongated hub, upon which is fastened a toothed pinion f^4 , which is engaged and rotated by the pinion f^5 , splined or keyed upon the main shaft A^4 . It is obvious by changing the diameter of the pinions and gears just referred to the speed of the cam d^7 may be made more or less—i. e., the main shaft A^4 may be made to rotate as many times as desired while the cam d^7 is rotated once.

The ruffler-blade d has attached to its upper side a loop g , having an inclined slot or opening, one part of the said loop resting upon a pin or stud g' , extended horizontally from an upright g^2 , connected to a stand g^3 , in turn connected with and extended laterally from the feed-bar. The ruffler-blade is moved backwardly by a suitable spring, as h , acting upon the arm d^6 , while the feed-bar is rising in its forward stroke to engage the material, and during this movement of the feed-bar through the devices g^3 g^2 g' and the loop g the free end

of the ruffling-blade is removed from the material being ruffled, so as to avoid any friction thereof which would tend to pull the material backwardly in opposition to the direction of the feed.

The length of the stroke of the ruffling-blade may be determined by the adjusting-screw m in the stand m' , and the height to which the ruffling-blade is lifted on its backward stroke by or through the stud g' may be regulated by adjusting the stud vertically in the upright g^2 , a thumb-nut m^3 being screwed onto the threaded end of the stud and the upright g^2 being slotted for this purpose. The stud f^3 is extended from a stand f^8 , herein represented as attached to the machine by a screw 10.

In this invention it will be noticed that by using the stiff cloth plate or support to sustain the strip to be ruffled the number of parts required for the production of a band-ruffle is reduced to the minimum and the band is not stretched or strained at its under portion in advance of the feed device or between the feed device and the operator, which is of the gist of this invention. The cloth plate or support may be in one or more pieces and be so shaped as to leave a suitable slot or opening for the under half of the band.

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

1. The cloth-plate having the feed-opening, a needle-opening, and a band-slot substantially at right angles to the direction of the feed of the material, and a feeding device combined with a ruffler-blade and devices to move it to engage the material lying on the cloth-plate and ruffle or lay the same in plaits combined with a band-folding guide, the upper part of which is located above the cloth-plate, while the under side and end thereof are located below the cloth-plate near said band-slot, whereby the lower part of the band may be led up through the said slot between the free or actuating end of the ruffling-blade and the feeding device, as and for the purposes set forth.

2. The cloth-plate provided with a feed-opening, a needle-hole, and a band-slot near the feeding-opening, a presser-foot, a ruffler-blade to act on the strip to be ruffled, said strip lying on the cloth-plate, means to move the ruffler-blade, a feeding device having an upright, a pin and yoke to act in lifting the ruffler-blade from the strip during the return stroke of the said blade, and a folding-guide to direct, fold, and deliver a band, substantially as described.

3. The cloth-plate provided with a feed-opening, a needle-hole, and a band-slot near the feeding-opening, a presser-foot, a ruffler-blade to act on the strip to be ruffled, said strip lying on the cloth-plate, means to move the ruffler-blade, a feeding device, an auxiliary feeding device carried by and moving in

5 unison with the feeding device and having a feeding-point engaging the under half of the band at the end of the band-slot between the end of the feeding device and the front of the ruffler-blade, and a folding-guide to direct, fold, and deliver a band to the stitch-forming mechanism without friction or strain thereon due to the action of the ruffler-blade during its operation, substantially as described.

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

ORANGE M. CHAMBERLAIN.

Witnesses:

FREDERICK L. EMERY,
EMMA J. BENNETT.