

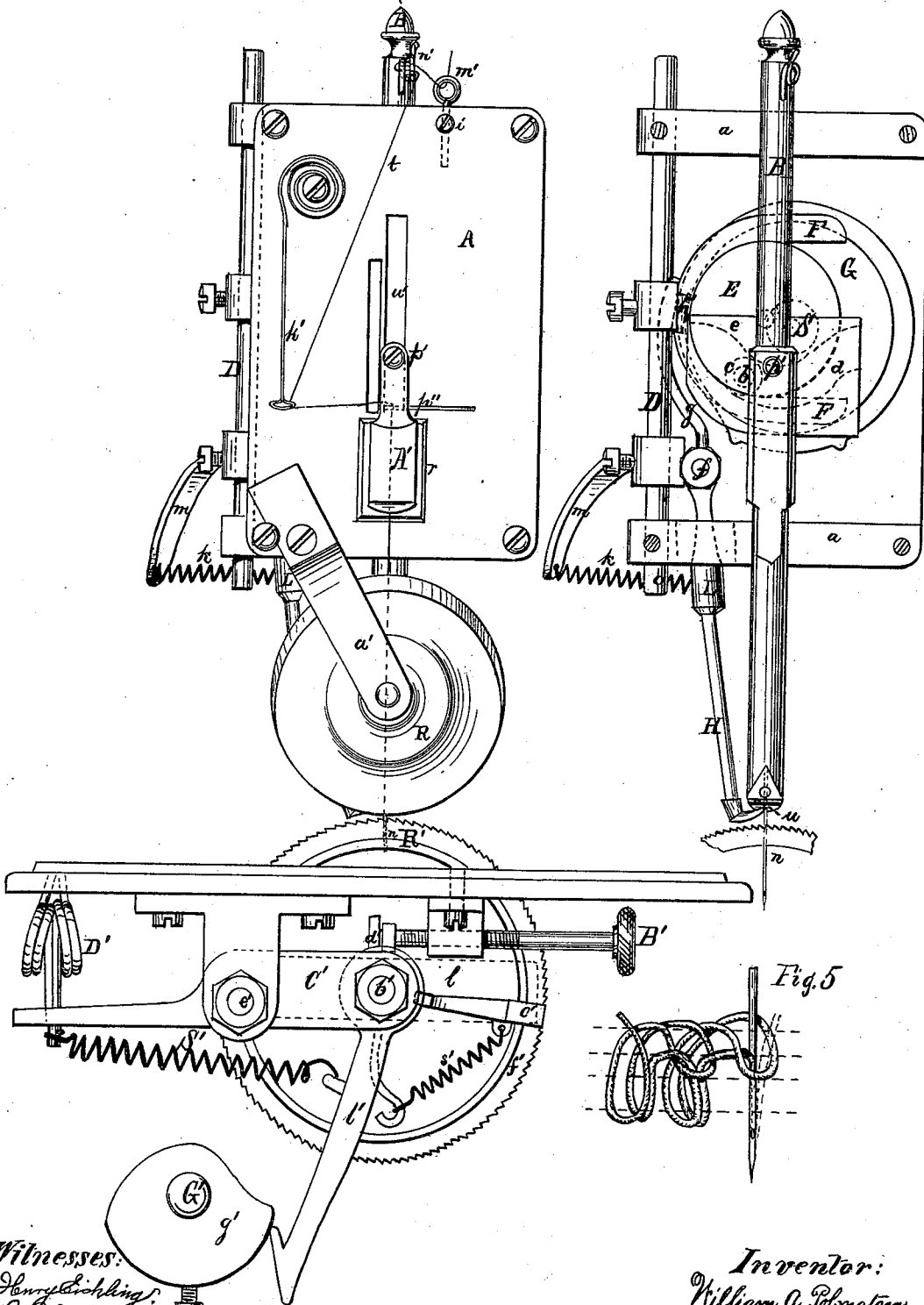
W. A. POLMATEER.
OVER-STITCH SEWING-MACHINE.

No. 170,390.

Patented Nov. 23, 1875.

Fig. 1.

Fig. 2.



Witnesses:
Henry Schickling,
P. B. Clark.

Inventor:
William A. Polmateer
By Atch. Fitch
His Att'y.

UNITED STATES PATENT OFFICE.

WILLIAM A. POLMATEER, OF JOHNSTOWN, NEW YORK.

IMPROVEMENT IN OVERSTITCH SEWING-MACHINES.

Specification forming part of Letters Patent No. **170,390**, dated November 23, 1875; application filed July 28, 1875.

To all whom it may concern:

Be it known that I, WILLIAM A. POLMATEER, of Johnstown, county of Fulton and State of New York, have invented an Improved Overstitch Sewing-Machine, of which the following is a specification, reference being had to the accompanying drawings, forming part hereof.

My invention relates to that class of sewing-machines which form what is called an over-stitch either on the edge or on a fold of fabric; and consists in the peculiar and special devices, mechanism, and combinations hereinafter particularly described.

Figure 1 is an end elevation of a sewing-machine embodying my invention. Fig. 2 is a similar view of the same, showing the mechanism which operates the needle-bar and loop-hook. Fig. 3 is a front elevation of the parts shown in Fig. 1. Fig. 4 is an enlarged detail view of the loop-hook; and Fig. 5 is a detail view of the stitch.

Similar letters of reference indicate similar parts.

B is the needle-bar, working in bearings in the frame *a* and plate A, and is thrown by the crank-pin *b*, fixed in the eccentric E, and provided with the bowl *c*, working in the irregular groove *d*, in the plate *e*, which is fixed on the needle-bar, as shown, and slides on the ways *w*. H is the loop-hook, formed, as shown, in Fig. 4, with the shank *s*, the curved wing or heel *w* extending from one side at its lower extremity, as shown, and the pointed hook *h* projecting forward and somewhat upward from the said wing or heel, and off the center of the same. The said loop-hook H is attached to the lever L, and is thrown by the bar D, to which the lever is pivoted at *f*, said bar being operated by the fork F, adjusted upon the eccentric E, which is fixed on the main shaft S, the said eccentric E being provided with the plate *p* on its outer side, which forms a rim or flange, as shown, preventing the disarrangement of the fork. The loop-hook H is given its proper lateral movements to take up the loop and carry it under the needle in proper position and hold it there while the needle descends through it, and then to leave the loop, by means of the curved arm *g* of the lever L, provided with the ear *h'*, engaging with the

rim and side of the compound cam G, which is formed as shown, the coil-spring *k*, which extends from the spring-arm *m* to the lower arm of the lever L, acting to keep the arm *g* in continuous contact with the said cam.

The feed device consists of the two rollers R and R', the upper roller, R, turning loosely on a pivot on the end of the curved arm *a'*, and made concave with a smooth surface on its side next the needle-bar, and set at an angle to the lower roller to allow the free play of the needle-bar and loop-hook, and also formed with a beveled rim, as shown, to give a level bearing against the lower roller. The said lower roller R' has a serrated rim, as shown, and revolves upon the short shaft *b'*, and is governed in its motion by the brake leaf-spring *l*, which is clamped upon it, and is revolved through the distance of each stitch, carrying the fabric with it, by the clutch *c'*, which engages with the lateral flange *f'* on the roller, operated by the clutch-lever *l'*, pivoted on the short shaft *b'*, and actuated by the oscillating cam *g'* and the coil-springs *S'* and *s'*. The cam *g'* is keyed to the shaft G', and is given its oscillating motion by means of a pitman connecting the shaft G' to the main shaft S. The short shaft *b'*, carrying the lower roller and its operating devices, is mounted on the lever C', which is pivoted to the bed-plate at *e'*, and is provided with the coil-spring D'. By means of an upward pressure exerted on the outward arm *h''* of this said lever, the lower feed-roller is separated from the upper roller R, so that the fabric may be readily inserted between them. This pressure may be conveniently applied through suitable mechanism by the foot or knee of the operator.

The thread *t* is passed first over an ordinary tension, T, and then through a guide-loop, *m'*, which is made adjustable in the plate A by means of the set-screw *i*, as shown, in order that the length of thread unreel at each stitch may be properly regulated, then through the guide-loop *n'*, which is fixed in the upper end of the needle-bar, as shown, and which acts, the thread being held taut at the needle, as hereafter shown, to unreel the thread required for each successive stitch by the upward movement of the said needle-bar, then down through the spring-tension *k'*, which is

attached to the plate A, as shown, and which acts to take up the slack of the thread, then around the guide-pin p'' , and across the raised plate r , and on down along the needle-bar, through the orifice u in its lower extremity to the needle n .

A' is a tension leaf-spring, which is fixed, as shown, to a pin, r' , set in the needle-bar, and extending through and working in the slotted opening w' in the plate A. This tension-spring A' being carried up and down by the movement of the needle-bar, crosses back and forth over the plate r , thus alternately pressing upon and releasing the thread t , which passes over said plate, and operating to hold the thread taut at the needle while the needle is going down through the fabric and returning, but permitting the slack thread held by the tension-spring k' to pass to the needle, when the needle is above the fabric, and a new stitch is about to be made.

The operation of my machine in stitching is as follows: The needle-bar being depressed to its lowest limit in the position shown in the drawing, and the needle passed down through the fabric, the loop-hook H is also at its lowest limit, as shown, which is below the cloth, and back of and a little to one side of the needle. The revolution of the main shaft S now raises the needle-bar and draws the needle upward through the fabric, and the thread on the outside of the needle, just above the eye, forms a loop, which the point h of the loop-hook enters. The loop-hook, during the further ascent of the needle, carries the loop on its point upward over the edge of the fabric, and passes somewhat forward, so as to tighten or draw up the loop formed on the previous stitch, and then over the fabric, and directly under the needle in its downward course.

By means of the curved heel w of the loop-hook, the loop is held distended under the needle-point, so that the needle descends through it on entering the fabric just behind the hook in the concave of the heel w . The hook is then withdrawn from the loop and the needle passes down through the loop and fabric, and returns upward through the same loop, while the loop-hook is again thrown down to its lowest limit, ready to catch the next loop.

By means of the crank-pin b , with its collar c working in the irregular groove d in plate e , fixed on the needle-bar, the said needle-bar remains stationary at its lowest limit on its descent through the loop and fabric, while the said pin and collar traverse the said groove from about the position shown in Fig. 2 to the quarter, during which time the loop-hook is

being thrown from its position to the rear of the needle on leaving the loop, down to its lowest limit.

An over stitch on the edges or on a fold of the fabric, such as shown in Fig. 5, is thus formed by the loops, which are formed below the fabric, and carried over the fabric across the edge or fold and tied, by the thread being passed down and up through each loop. As each successive loop is brought up by the hook, the feed-roller R' carries the fabric along the length of one stitch, and the length of the stitch to be taken may be regulated by the set-screw B', which bears against the small arm or pin d' in the lever V', and hence permits a longer or shorter swing of the said lever in operating the clutch c' .

My machine is adapted to form an over-stitch on both light and heavy fabrics and materials. When heavy fabric is being stitched the tension leaf-spring A' should be used as described, but when light fabric, such as knit goods, is stitched, this tension will not be necessary, the tension k' being then sufficient to hold the thread taut enough.

I do not intend to claim herein the peculiar over stitch made by my machine, as herein shown and described, reserving to myself the right to make the said stitch the subject hereafter of a separate and distinct application for Letters Patent.

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

1. In an over stitch sewing-machine, the loop-hook H, having the shank s , the curved heel w , and hook-point h , as described, and for the purpose specified.

2. The combination of the needle-bar B, carrying the needle n , having plate e , irregular groove d , and crank-pin b , with collar c , the loop-hook H, lever L, compound cam G, coil-spring k , bar D, fork F, and eccentric E, as described.

3. The combination, with the needle-bar B and needle n , carrying thread t of the tension T, adjustable guide-loop m' , guide-loop n' , tension-spring k' , pin p'' , plate r , and tension-spring A', as described.

4. The combination of the upper feed-roller R, lower feed-roller R', brake leaf-spring l , clutch c' , clutch-lever V', oscillating cam g' , coil-springs S' and s' , short shaft b' , lever O', and spring D', as described.

WM. A. POLMATEER.

Witnesses:

G. W. MARLEY,
JAMES M. DUDLEY.