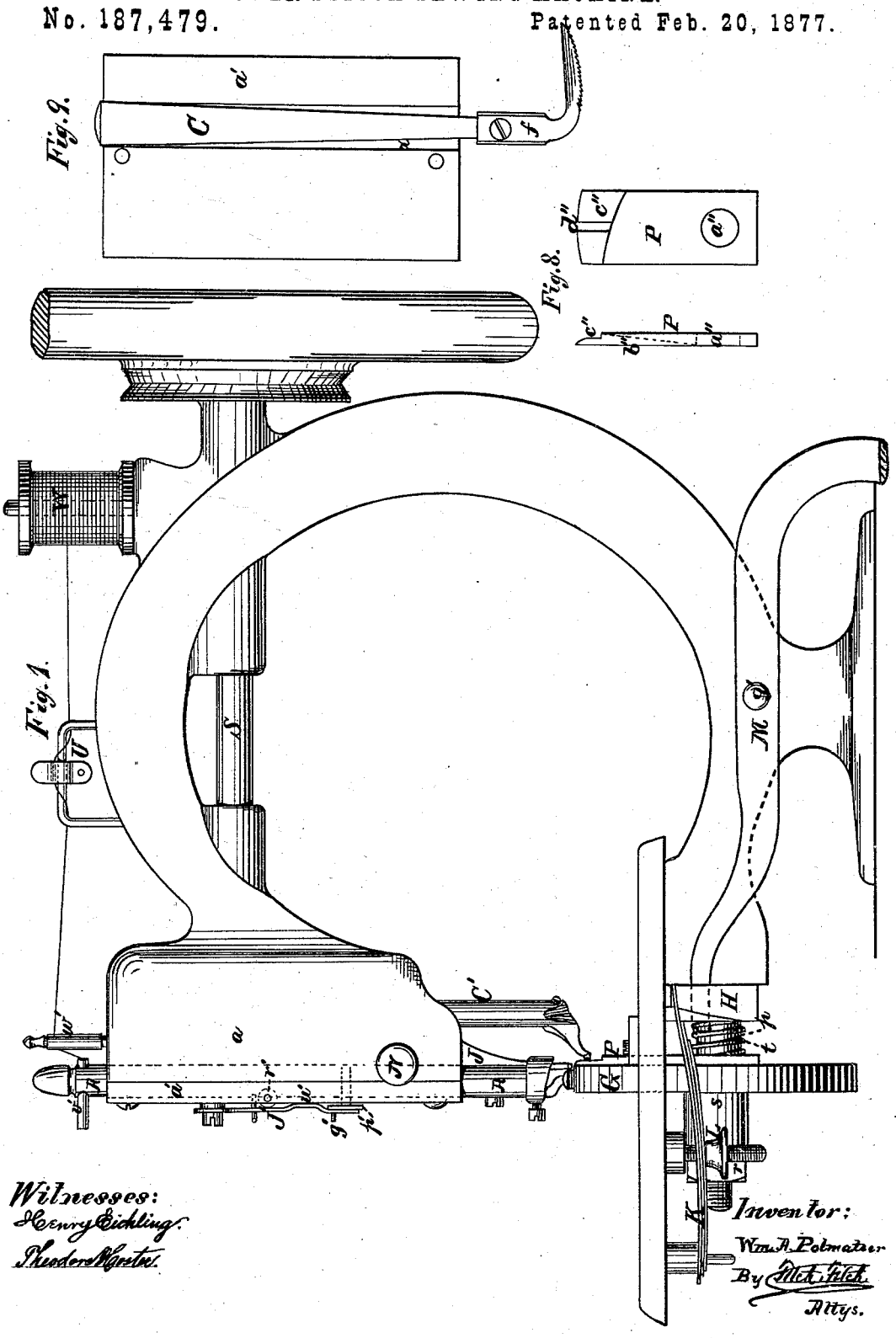
2 Sheets—Sheet 1.

W. A. POLMATEER.

OVER-STITCH SEWING-MACHINE.

No. 187,479. Patented Feb. 20, 1877.



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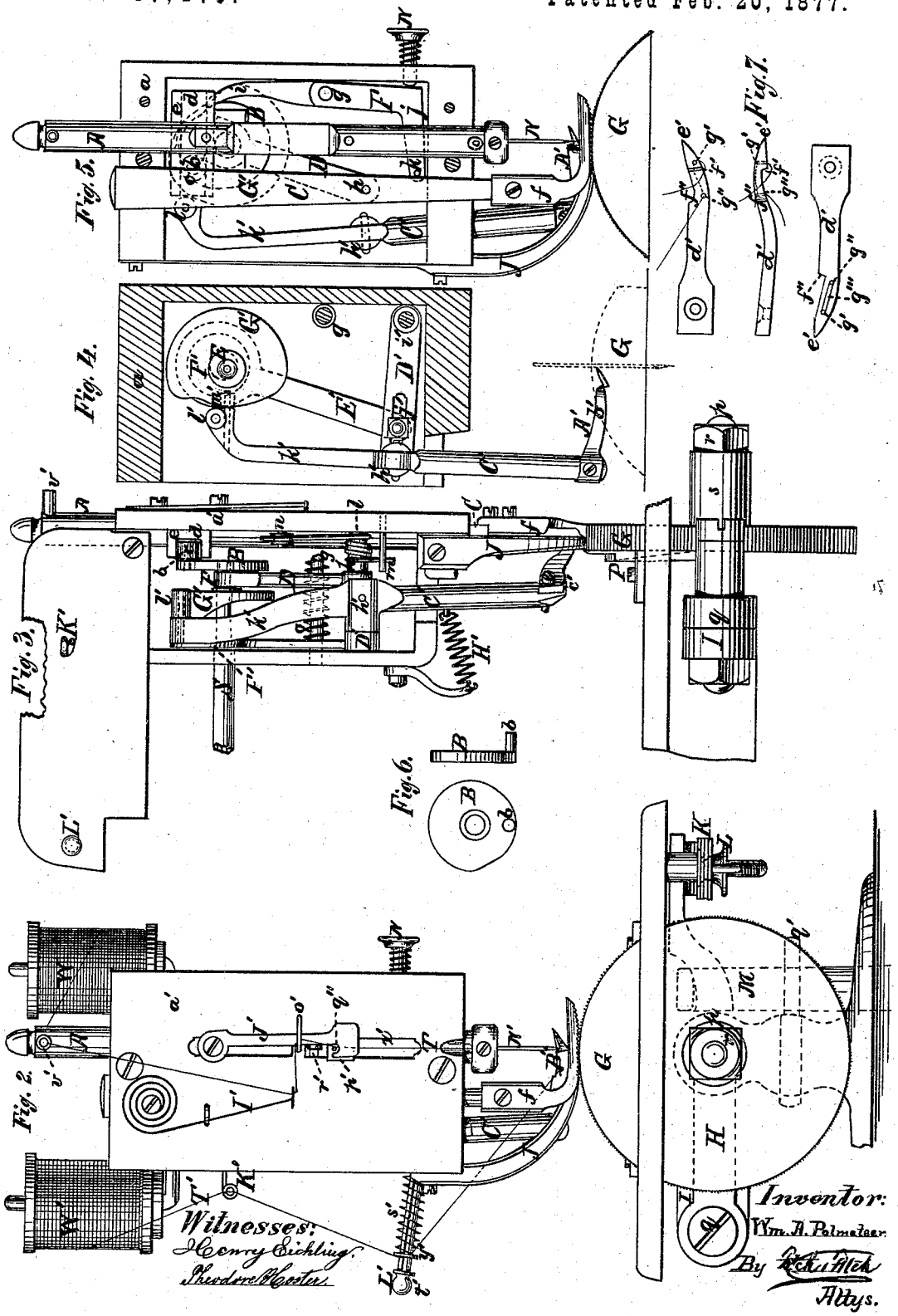

UNITED STATES PATENT OFFICE.

WILLIAM A. POLMATEER, OF JOHNSTOWN, N. Y., ASSIGNOR TO HIMSELF AND JAMES S. HOSMER, OF SAME PLACE.

IMPROVEMENT IN OVERSTITCH SEWING-MACHINES.

Specification forming part of Letters Patent No. **187,479**, dated February 20, 1877; application filed March 25, 1876.

To all whom it may concern:

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

My invention relates to a sewing-machine adapted to form an overstitch on the edges or on a fold of fabric; and it has for its object an improvement upon a sewing-machine of this class, described, shown, and claimed by me in Letters Patent of the United States, No. 170,390, issued to me November 23, 1875, whereby a machine is constructed which is simpler and less cumbersome in mechanism, possesses greater durability, and is less liable to get out of order, is more easily operated, and is noiseless in operation, and is better adapted to sew upon a greater variety of fabrics; and my invention consists in the peculiar and special devices, combinations of parts, and mechanism hereinafter described, and more particularly recited in the claims.

In the drawings, Figure 1, Sheet 1, is a front elevation of my improved overstitch sewing-machine. Fig. 2, Sheet 2, is an end elevation of the same. Fig. 3, Sheet 2, is a rear elevation, exposing the mechanism which operates the needle-bar, loop-hook, and feed-bar. Fig. 4, Sheet 2, is a vertical section of the frame, holding the parts exposed in Fig. 3, and showing the mechanism which operates the feed-bar. Fig. 5, Sheet 2, is an end elevation exposing the same parts shown in Fig. 3. Fig. 6, Sheet 2, shows a side and edge view in detail of the cam which actuates the lateral motion of the feed-bar, and carries the crank-pin which throws the needle-bar. Fig. 7, Sheet 2, is a detailed view of my improved looper, employed when two threads are used in sewing. Fig. 8, Sheet 1, is a detailed view of the throat-plate employed to prevent the looper from catching the needle. Fig. 9, Sheet 1, is a detailed view of the feed-bar.

In fully and clearly describing my improved machine it will be necessary to also name and describe some of the parts shown in the drawings, which are also shown and named in the schedule and drawings of my issued Letters Patent hereinbefore referred to.

A is the needle-bar, which moves in bearings in the frame *a* and plate *a'*, and is thrown by the crank-pin *b* set in the cam B, and provided with collar, *c*, working in the straight groove or channel *d* in the plate *e*, which is fixed on the needle-bar.

The devices constituting the feed mechanism in my improved machine are as follows: C is the feed-bar working in a bearing formed in the plate *a'*. This bar is held in its bearing by the plate *e*, which works against and over it, as shown. The said bar is somewhat tapered from its upper to its lower end, on its edges, as shown, to permit of a lateral movement in its bearing or way *x*, and it has secured upon its lower end the foot *f*, which has a serrated under surface. This bar C is thrown vertically by the rod D, which is pivoted to it by the pin *h*, the said rod being actuated by the eccentric E, which is fixed on the main shaft S, as shown, the upper end of the said rod being forked, and the said fork engaging the said eccentric. The bar C is vibrated or thrown laterally by the crank-lever F, which is pivoted in the frame *a* on the shaft *g*, its upper arm *i* engaging with the cam B fixed on the main shaft S, and its lower or crank arm *j* having the pin *k*, which bears against the bar C, as shown.

About the pin *h* is coiled the spring *l*, one end of which bears against a pin, *m*, set in the plate *a'* upon one side of the pin *h*, and the other end bears upon a grooved friction-roller on a pin, *n*, set in plate *a'* on the other side of the pin *h*. By means of this spring thus coiled, when the bar C has been thrown forward laterally by the crank-lever F, it is thrown back ward again, forcing the crank-lever with it. To aid in this movement a coil-spring, *o*, is arranged on the shaft *g*, which is the pivot of the lever F. The arm *i* of said lever is thus kept constantly engaged with the cam B. In place of the spring *l* and its pins *m* and *n*, any other equivalent or suitable device may be employed to throw backward the bar C.

G is a roller, having a toothed or serrated rim, as shown, and turning freely on the shaft *p*. The said shaft is fixed in the lever H,

which is pivoted at *q* to the arm I beneath the work-plate of the machine. The roller G projects upward through a slot in the said work-plate, and its upper rim is in contact with a smooth surface fixed foot-piece, J, which is attached to the frame *a*, and extends downward alongside of the feed-foot *f*, which also, when the bar C is at its lowest limit, is in contact with the rim of the roller G. The pressure of the roller G against the foot-piece J and feed-foot *f* is preserved by means of the leaf-spring K, which is clamped against the end of the lever H, and the degree of pressure is regulated by means of the thumb-nut L, as shown. Upon the standard of the machine, at *q'*, is pivoted a lever, M, one end of which is arranged to engage the lever H, the other end being extended downward at an angle below the standard and top of the machine to about opposite the operator's knee.

By means of these devices, as described, a pressure by the knee upon the latter-mentioned arm of the lever M will act to overcome the action of the spring K, and thus swing the roller G away from the foot-piece J, whereby the material to be sewed may be properly introduced and adjusted between them. The roller G is capable of lateral adjustment, so that it may be properly adjusted to the needle, to avoid lost motion, by means of the nut *r*, which works upon a thread formed on the shaft *p*, and bears against a sleeve, *s*, formed on the roller G, a coil-spring, *t*, being interposed between the said roller and the side of the lever H.

The operation of my improved feed mechanism is as follows: The material being adjusted between the roller G and fixed foot J, the feed-bar C is thrown down, and the feed-foot *f* presses down upon the material. This pressure is sufficient to push the roller G just far enough away from the fixed foot J to permit the free movement of the material between them by the second motion of the feed-bar. The feed-bar is now vibrated forward laterally the length of one stitch, carrying with it the material upon the roller G, which turns upon its shaft. The feed-bar being now thrown upward and carried backward, the roller again presses up against the foot-piece J.

The length of the stitch is adjustable by means of the thumb-screw N, having a coil-spring about it, arranged in the frame *a*, as shown, to bear against the lower arm and limit the movement of the crank-lever F.

The looper A', which I employ in my improved machine when one thread is used in sewing, is formed with the winged heel-piece and upwardly-turned hook end shown and described in my former and hereinbefore-described Letters Patent. The shank *b'* of this looper I prefer to form as shown in the drawings—that is, extending in nearly a right line with the hook, and with a recess or shoulder on its butt end, as seen at *c'*, by which it may be clamped or screwed upon the end of the lever which throws it. By means of this shank I am enabled to do away with the irregularly-curved shank heretofore employed, and by extending the said lever downward to form an angle at the butt of the looper more convenient and suitable, to allow the employment of two threads in sewing, and the attachment of the proper looper for that purpose.

B' indicates the looper which I employ in my improved machine, when it is desired to use two threads in sewing. This looper is formed, as shown plainly in Fig. 7—that is, with a nearly straight shank, *d'*, by which it may be clamped upon the lever which throws it, and with the pointed upwardly-inclined hook end *e'*, and is cut away at *f'* and *f''* on its side and upper edge, respectively, as shown, and has the transverse openings *g'* and *g''* through it, the former being located where the shank is cut away or thinned at *f'*, and the latter being through the thick part of the hook end, as shown, and having the small channel or groove *g'''* leading from one of these transverse openings to the other on the outwardly-curved side of the looper, and opposite to the cut-away portion *f'*. The hook end *d'* is curved upon its outward side, as shown, and is straight on its opposite side. By this means it is made to have a somewhat thick blunt end, as shown.

The devices which constitute the mechanism which operates the above-described loopers in my improved machine are as follows: C' is the lever which throws the looper, and to the lower arm of which the looper is attached. This lever is pivoted by a universal joint at *h'* to the rock-lever D', which is pivoted at *i'* in the frame *a*. To the lever D' at *j'* is connected the rod E', which engages at its upper end the eccentric F' fixed on the main shaft S. The connection at *j'* is adjustable, whereby the vibration of the lever D' may be made longer or shorter, as may be desirable. By means of this mechanism the looper is thrown vertically. The looper is thrown laterally by means of the compound cam G', which the upper arm *k'* of the lever C' engages, as shown. This upper arm *k'* is furnished at its end with two pins, *l'* and *m'*, set at right angles to each other, and provided with friction-rollers, as shown, which are arranged to work, respectively, against the rim and side of the compound cam G'. A spring, H', arranged as shown, operates to keep the arm *k'* continuously engaged with the cam G'.

In my improved machine the devices constituting the mechanism for catching and holding the thread supplied to the needle N', at the time the needle is on the last half of its descent, are as follows: A plate, *p'*, is fixed in the needle-bar, and is provided with a guide-pin, *q''*, and moves with the needle-bar by means of a long slot, *x'*, in the plate *a'*, as shown. A leaf-spring, J', is also fixed in and moves with the needle-bar, and extends downward across the plate *p'*, upon which it is arranged to press while the needle-bar is on the last half of its descent. The spring J' is

bent or bowed inward toward the plate a', so as to form a prominence, u', on its inner face. A pin, r', is set in the plate a' in the edge of and across the slot x', and is provided with a friction-roller, as shown. This pin is so arranged and located that upon the ascent of the needle-bar the projection w' on the spring J′ will engage it, and thus raise the spring away from the plate p', so that the thread may pass to the needle for the ensuing stitch. This thread T is unreeled from a spool, W, and passes through any ordinary tension, U, through the loop-stud w', the short tube v' fixed transversely in the needle-bar, through the spring take-up I′, around guide-pin o', and thence down between the plate p' and spring J′ to the needle.

When two threads are employed in sewing with my improved machine, the thread T supplied to the needle is arranged and operates as above set forth, while a second thread, T′, supplied to the loop-hook B′, is unreeled from a spool, W′, and passes through a guide-loop, K′, to a take-up, L′, and thence down to the opening g' in the looper, and through it, along the channel g''', to and back through the opening g'', and is then thrown across the looper back of the shoulder f', as seen plainly in Fig. 7. The take-up L′ is formed of a stud, t', fixed in the plate a, and projecting laterally therefrom, and having a longitudinal slot, through which the thread passes, and having a washer, y', against which the thread bears, and which works against a coil-spring, s', which is arranged about the stud. When the looper descends, the thread T compresses the spring s'; and when the looper ascends, the spring reacts, thus keeping the thread always taut at the looper.

When two threads are employed in my improved machine the operation of sewing is as follows: As the needle carrying the thread T is thrown upward, a loop is formed on the side of the needle between the eye and the edge of the fabric or seam. The looper B′, carrying the thread T, enters this loop, and, as the needle continues to ascend, carries the said loop up over the edge of the fabric, and by its lateral movement brings both threads a little back of the edge. The looper holds the threads in this position while the needle descends, and the needle in its descent passes through the loop of the thread T′, such loop being shown in Fig. 7, the loop of the thread T being held on the point of the looper B′ away from the path of the needle. The needle thus descending, while the looper withdraws from the loop in the thread T, carries the thread T with it down through the loop in the thread T′, and the looper, catching the next loop in the thread T formed on the needle, loops the thread T′ through the thread T on the under side of the edge of the fabric. The thread T′ is thus alternately looped through the thread T on the lower and upper side of the fabric, and is there held by the thread T, which simply passes up and down through the fabric, while the thread T′ passes around the edge of the fabric.

To prevent the loopers A′ or B′ from catching and breaking the needle when they loop into the thread T, I provide in my improved machine a throat-plate, P, which has an opening, a'', by which it is mounted on the shaft p between the roller G and coil-spring t, and extends upward through a slot in the work-plate by the side of the roller G to the rim thereof, the upper edge of said plate P being rounded off to conform to the said rim of said roller, as shown. The throat-plate has a channel, b'', extending obliquely across it toward the side next the roller G, and has its face toward the looper cut away, as shown at c'', to form a path for the looper; and the channel b'' above said path c'' is in the form of an open slot, d'', extending to the upper edge of the plate, and through which the loop of the thread extends.

By means of this plate, so formed, the needle, in its descent, is guided somewhat inward away from the looper by the channel b'', while it is guarded from the looper while the same is entering the loop by the edges of the slot d''.

It is not my intention herein to claim the peculiar overstitch made by the looper B′ when two threads are used, and I do not claim such stitch hereunder, reserving my right to make the same the subject of a separate application for Letters Patent.

I do not intend to claim herein any of the parts, devices, combinations of devices, or mechanism shown, described, and claimed in my hereinbefore referred to Letters Patent; and I hereby disclaim such specific devices, combinations of parts, and mechanism as therein described and claimed.

What I do claim as my invention herein, and desire to secure by Letters Patent, is as follows:

1. The combination, in a sewing-machine, of the roller G, turning loosely on a yielding bearing, the vibrating and reciprocating feed-foot f, and the fixed foot-piece J, whereby the material to be sewed is fed to the needle.

2. The combination, in a sewing-machine, of the tapered bar C, working in a rectangular way, x, in plate a', and carrying feed-foot f, with the rod D pivoted to said bar by pin h, having spring l, and engaging eccentric E on main shaft S, the crank-lever F carrying pin k and engaging cam B, whereby the said bar C, carrying the said feed-foot, is given its peculiar vibrating and reciprocating motions, as herein described.

3. The combination, in a sewing-machine, of the fixed foot-piece J, feed-roller G on shaft p, mounted on lever H, pivoted at q to arm I, and spring K, and nut L, with the knee-lever M, whereby the said feed-roller is given a yielding bearing, and whereby said roller may be swung away from the said fixed foot-piece, as described.

4. The combination, in a sewing-machine,

of the feed-roller G, having sleeve *s* on shaft *p* in lever H, and nut *r* and spring *t*, whereby the said feed-roller is capable of adjustment laterally to the needle, as described.

5. In a sewing-machine, the throat-plate P, having oblique longitudinal channel *b''*, the transverse path *c''*, and open slot *d''*, whereby the needle is somewhat deflected on its downward course, and its contact with the looper is avoided, as described.

6. In a sewing-machine, the combination of the throat-plate P, constructed as described, with roller G on shaft *p*, lever H, nut *r*, and spring *t*, whereby the plate P is capable of lateral adjustment with roller G to the needle, as described.

7. In a sewing-machine, the double-thread overstitch looper B′, having hook end *e′*, shoulders at *f′* and *f''*, and transverse openings *g′* and *g''*, as described, and for the purpose specified.

In witness whereof I have hereunto set my hand this 14th day of March, 1876.

WM. A. POLMATEER.

Witnesses:
LEO GRISWOLD,
J. MCLAREN.

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