J. L. FOLLETT.

SEWING-MACHINE.

No. 189,931. Patented April 24, 1877.

Fig. 1.

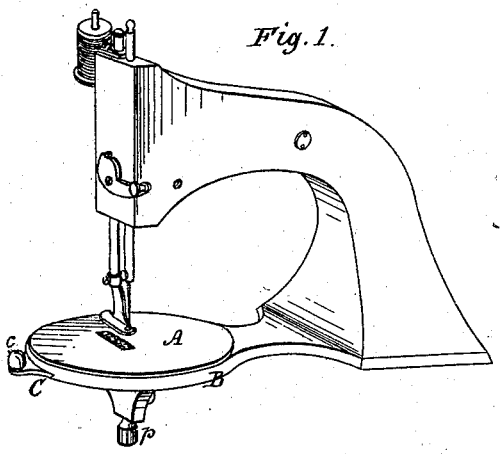


Fig. 2.

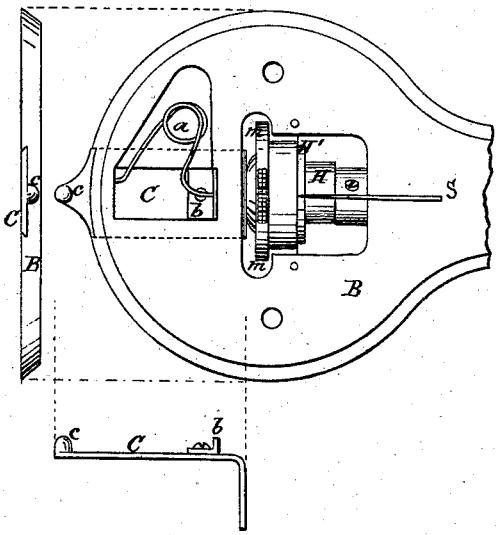


Fig. 3.

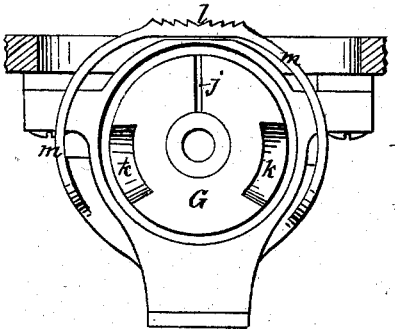


Fig. 4.

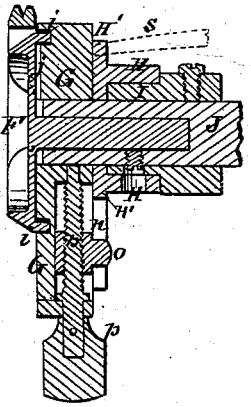


Fig. 5.

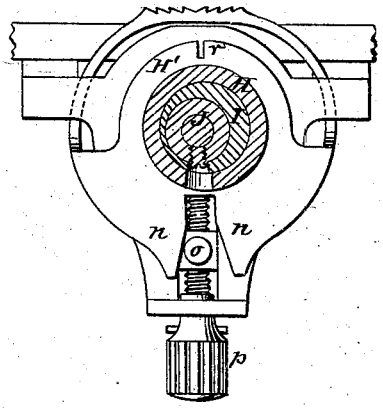


Fig. 6

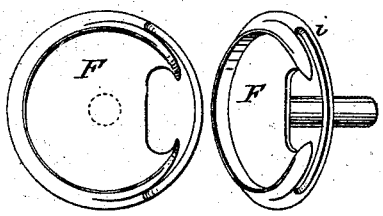
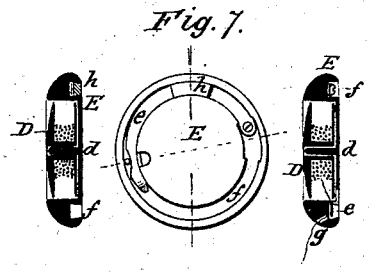


Fig. 7.



Attest:

Ewell & Dick

D. P. Coe

Inventor:

J. L. Follett by

Pollok & Bailey

his attorneys.

UNITED STATES PATENT OFFICE.

JOSEPH L. FOLLETT, OF NEW YORK, N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **189,931**, dated April 24, 1877; application filed January 22, 1877.

To all whom it may concern:

Be it known that I, JOSEPH L. FOLLETT, of the city, county, and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification:

The sewing-machine shown in the drawings accompanying this specification, in illustration of my invention, is constructed to operate upon the same general plan as that set forth in my Letters Patent No. 162,372, dated April 26, 1875.

The improvements which I am about to describe may, any one or all, be used in a single machine. They relate, principally, to the bobbin-holder, the bobbin and bobbin-case, the reversible double hook, and the reversible feed, and they will be described in the order just named.

That part of my improvements relating to the bobbin-holder is represented in Figures 1 and 2 of the accompanying drawing.

In the machine described in my aforesaid Letters Patent there is a divided cloth-plate, to the movable part of which is attached the bobbin-holder. I have found this device extremely useful, but have, at the same time, encountered practical difficulties in its application. A divided cloth-plate is objectionable because it is expensive in construction, requiring devices to hold it in position, and necessitating nice adjustment; moreover, foreign matters, such as fibers of the cloth, &c., are apt to work into the joint and prevent the accurate adjustment of the two parts.

To remedy these defects I now proceed as follows: The cloth-plate A, which is of circular form, and provided with the proper apertures for the feed and needle, is secured by means of screws to the cloth-plate support B, which forms part of the frame or body of the machine. The support B is recessed, to admit a sliding spring bobbin-holder, C, which consists of a plate, the horizontal portion of which is made to slide in a dovetailed recess in the bottom or under face of the support. This recess is of sufficient depth to receive above the bobbin-holder a spring, *a*, whose front end bears against a shoulder on the support, and whose rear end bears against a stop or flanged plate, *b*, on the upper face of the horizontal portion of the bobbin-holder, as shown in Fig. 2 in plan, the cloth-plate being removed to expose the parts beneath.

By this means the sliding holder is pressed toward the bobbin, and against the rear end of the recess in the support B. The flanged plate or stop *b* is held to the holder by a screw in an adjustable manner, so as to allow it to be moved to regulate the distance between the vertical part of the bobbin-holder and the hook or bobbin-case.

The bobbin-holder is provided at the front with a projecting knob or thumb-piece, *c*, by which it may be withdrawn, in order to release the bobbin. As soon as the holder is released it returns to its proper position, being, in fact, self-closing. Its described arrangement beneath the cloth-plate effectually obviates the objections above referred to.

The next portion of my improvements, relating to the bobbin and bobbin-case, is illustrated in Fig. 7 of the drawings.

In consequence of the arrangement of the bobbin in its case, and between the holder and the hook—an arrangement which admits of considerable play of the bobbin within its holder—it often happens that the edge of the outer disk of the bobbin, as ordinarily constructed, will pass out beyond the edge of the surrounding portion of the bobbin-case, thus allowing the needle-thread, as it is drawn from the hook, to get between the bobbin and bobbin-case, in which case, of course, the thread will break.

To prevent this, I give the outer disk of the bobbin D a convex or equivalent form, so that its edge shall always be retired within the cavity in the bobbin-case E, whatever play the bobbin may have therein. A flat disk with beveled edges or inwardly-bent edges would be an equivalent of the convex formation.

To avoid circumferential friction between the bobbin and its case, I provide the latter with a spindle, *d*, which passes into a central orifice in the bobbin.

Tension on the bobbin-thread is produced by a flat semicircular spring, *e*, secured at one end in annular groove *f* formed in the rear face of the bobbin-case E. The thread from the bobbin passes through an orifice into the groove *f*,

under the free end of the spring, and thence back through an orifice, *g*, extending to the front of the bobbin-case, from whence the thread emerges, as shown on the right in Fig. 7. A sliding presser-block, *h*, confined, but movable, in the circular groove *f*, and arranged over and in contact with the spring, regulates the working length of the latter, and, consequently, the intensity of the spring-pressure on the thread. The shorter the working length of the spring, or, in other words, the nearer the presser-block to the free end of the spring, the greater the pressure of the spring upon the thread passing between it and the bobbin-case.

The next portion of my improvements relates to the rotary reversible double hook, and is illustrated in Figs. 3, 4, and 6.

The hook possesses the general charateristics of that described in my above-mentioned Letters Patent, and is what I call a "reversible hook"—that is to say, a hook that will take a loop from the needle whichever way it may be revolved. In operating the hook at high speeds I have found that, owing to the proximity of the two hooks proper, which face one another, the loop, when cast off from the one hook, is liable to be caught by the other.

To obviate this difficulty I so construct and arrange the hook, and combine it with a stationary point-protecting back plate, that whenever one of the points or hooks proper is free to cast off the loop the other shall be closed, or in contact with the back plate, thus rendering it incapable of catching, at this time, the thread.

The manner in which I arrive at this result is illustrated in the drawing. The hook F is provided on the back with an annular rim, *i*, which fits and revolves in a corresponding recess in the fixed back plate G, thereby not only insuring perfect accuracy of rotation, but also preventing the needle-thread, when taken by the hook, from passing between the body of the hook and the back plate. The face of the back plate, with which the hook is in contact, is flat and smooth, and has formed in it three recesses, as shown in Fig 3, which is a front view of the plate with the hook removed. These recesses are a needle race or groove, *j*, and two recesses or pockets, *k*, whose positions coincide with those of the two hooks, respectively, (according to the direction of revolution,) when the loop is taken off by the action of the take-up. The hooks, except when they arrive at these pockets, are closed, running, as they do, with their points against the back plate. The length of each pocket *k* should be about equal to, or perhaps a little less than, the distance between the two hooks, so that at the time when the acting hook is open, or free to cast off the loop, the other hook shall be closed.

The needle race or groove *j* is provided to receive the descending needle and protect it from injury, and makes it impossible for the machine to skip a stitch.

The standard G, which forms what I have termed the "back plate," serves also as a bearing for the feed adjustment, (to be presently described,) and furnishes a solid bearing for the cloth-plate at the point where the shock of the needle is most felt when sewing goods.

I come now to the feed, which constitutes the last portion of my improvements, and is shown in Figs. 2, 3, 4, and 5.

Fig. 2 is a plan, Fig. 3 a front elevation, Fig. 5 a rear elevation, and Fig. 4 a transverse vertical central section, of the feed.

This feeding device resembles, in many respects, the one described in my above-named Letters Patent; but in some material respects it differs therefrom. The feed-surface *l* is carried by an arch or branching arms, *m*, extending down in front of the standard G, thence passing to the rear of the same, and joining a hub, H, mounted on an eccentric, I, on the hook-shaft J, in the rear of standard G. The parts *l*, *m*, and H are solidly united or formed in one piece. The hub H is formed with a collar, H′, prolonged at its under part into two diverging tail-pieces, *n*, between which is a pin, *o*, adjustable up and down. It is rendered so adjustable by being attached to a nut arranged to move up and down in a guideway or slot in standard G, this nut being moved by an adjusting-screw, *p*, supported in the standard. The screw is provided with a milled head, by which it may be turned. By means of the devices just described the feed is regulated.

The collar H′, above the shaft, is provided with a slit, *r*, into which passes the end of a stiff spring, *s*, Fig. 2, which, at the other end, is fixed to the support B. This spring resists the tendency of the hub H to revolve with the eccentric, but yields sufficiently to allow the proper oscillation needed to produce the the feed-movement.

Having now described my improvements, and the manner in which the same are or may be carried into effect, I would state, in conclusion, that I do not limit myself to the precise details herein shown and described, for the same may be considerably varied without departure from my invention.

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

1. The bobbin-holder, arranged to slide in a recess in the cloth-plate support, in combination with a spring which tends to force it toward the bobbin, and is contained in a recess between the cloth-plate support and the cloth-plate above, substantially as shown and described.

2. The sliding bobbin-holder and its spring, arranged between the cloth-plate support and the cloth-plate, as described, in combination with the adjustable flanged plate or stop on bobbin-holder, substantially as set forth.

3. The rotary hook, formed with a rearwardly-projecting annular rim, in combination with a back plate or standard, provided with a corresponding groove to receive said rim.

4. The double reversible rotary hook and the back plate formed with pockets or recesses,

these parts being combined to jointly operate substantially in the manner set forth.

5. The bobbin-thread tension, consisting of a tension-spring in a groove on the back of the bobbin-case, in combination with the adjustable block or presser, held and movable in said groove, for the purpose of regulating the working-length of the spring, substantially as described.

6. The feed, consisting of an arch or curved branches carrying the feed-suface, and united with a hub mounted on an eccentric, as described, in combination with the spring engaging the upper part of the hub, and the adjusting-pin, movable between the diverging arms or tail-pieces of said hub, as set forth.

7. In combination with the cloth-plate and the cloth-plate support, the standard or back plate, attached to the cloth-plate support, and arranged as described, to afford a central bearing for the cloth-plate and the hook, as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

J. L. FOLLETT.

Witnesses:

OSCAR J. HOCHSTADTER,

FRANK W. MILLER.