J. L. FOLLETT.

Sewing-Machines.

No. 135,536. Patented Feb. 4, 1873.

Fig. 1.

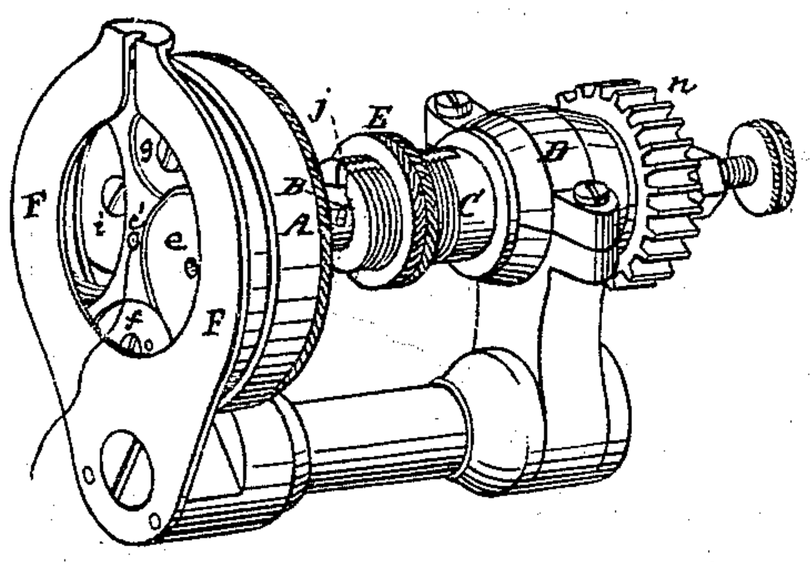


Fig. 2.

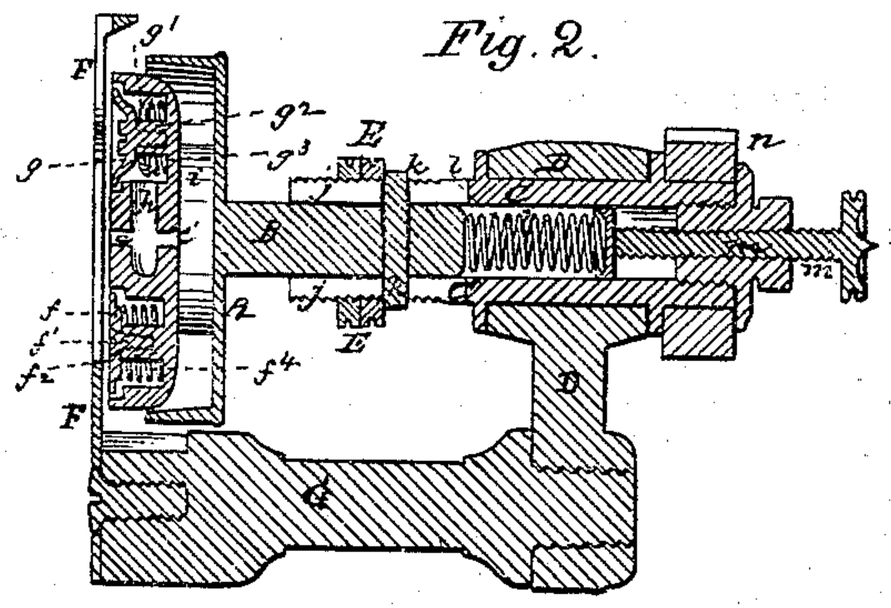


Fig. 3.

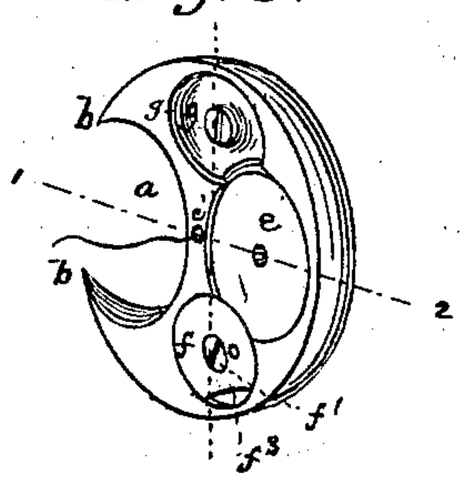


Fig. 4.

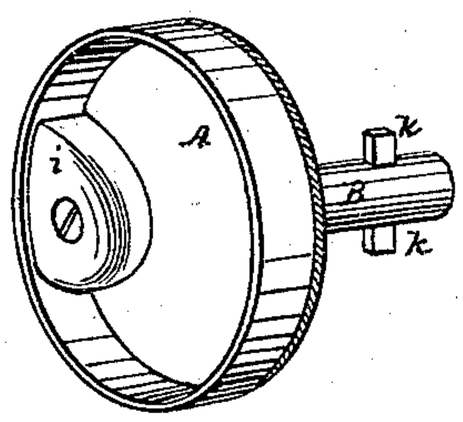


Fig. 5.

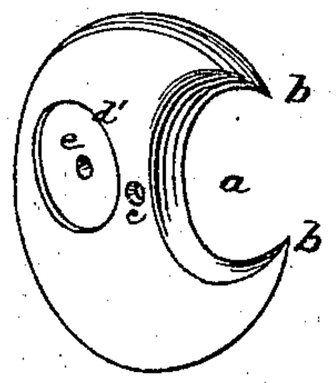


Fig. 6

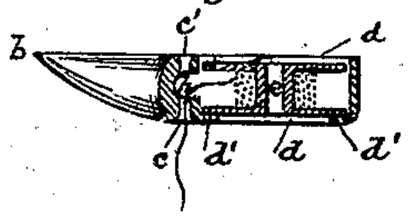


Fig. 7.

Fig. 8.

Witnesses

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# UNITED STATES PATENT OFFICE.

JOSEPH LEONARD FOLLETT, OF TROY, NEW YORK.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **135,536**, dated February 4, 1873.

*To all whom it may concern:*

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

This invention relates to an improved shuttle and an improved shuttle-holder for sewing-machines. The shuttle which I have invented is a double-pointed crescent-shaped rotary shuttle, revolving upon a center or axis within its body in contradistinction to a center or axis outside of or beyond the body, and pierced through this center or axis with a hole, through which the thread from the bobbin may be passed to the one side of the shuttle or the other, as required, the threading to the one side producing a stitch of a different character to that which is produced by threading to the other side, as hereinafter described. The shuttle is designed to revolve and to sew in either direction, and can be used with either a single or a double machine. The shuttle holder and propeller consists of a socket or cup arranged to rotate and adapted to receive the shuttle, and to compel the same to follow its rotary movement, the said cup or socket being combined with means, substantially as hereinafter described, whereby it may be caused to press the shuttle with more or less force, as required, against a stationary plate, between which and the cup the shuttle is held.

The nature of my invention, however, and the manner in which the same is or may be carried into effect, can best be explained by reference to the accompanying drawing, in which—

Figure 1 is a perspective view of the shuttle and holder. Fig. 2 is a longitudinal vertical central section of the same. Fig. 3 is a view of the shuttle, looking at its flat side or front. Fig. 4 is a view of the shuttle-receiving socket or cup and the shaft or axis of the same. Fig. 5 is a view of the shuttle from its rounded side or back. Fig. 6 is a cross-section of the shuttle on the line 1 2, Fig. 3.

The shuttle, as shown, has, for the most part, a discoidal shape, being flat on one side, which I shall call the front, and rounded on the other side, which I shall call the back. Its periphery for about three-quarters of its extent is unbroken; the remaining quarter, or even less, of the periphery being cut away and recessed, in the manner clearly shown at *a* in Figs. 3 and 5, so as to form the two horns or points *b b*. The recess *a* does not extend so far as the center or axis of the disk, and at this center or axis the shuttle is pierced through from front to back to form the thread-hole *c*. In the body of the shuttle, on the side of the center hole *c*, opposite the recess *a*, is formed a cylindrical receptacle, *d*, for the bobbin or spool *e*, extending through from front to back, and provided with an annular flange, *d'*, at the back to hold the bobbin in. The bobbin is put in from the front of the shuttle, and at its rear rests against this flange.

The making this receptacle to open through the back of the shuttle is advantageous on several accounts: It permits the thread from the bobbin to be threaded through the hole *c* out at the front of the shuttle; it saves friction on the needle-thread by lessening the bearing-surface on the widest or thickest part of the shuttle; it also lessens friction on the bobbin or spool, and lightens the shuttle; and the bobbin can be taken out easily from the shuttle by simply pressing the finger against the bobbin through the opening, and without turning over the shuttle and shaking it, which it would be necessary to do were the receptacle closed at the back.

Any suitable device for holding the bobbin in its case or receptacle may be employed. In this instance I make use of a disk, *f*, located in a recess in the shuttle on one side of the bobbin, as shown in Fig. 3. This disk is held in place by a screw, $f^1$, which screws into a socket-piece, $f^2$, in the shuttle, (see Fig. 2;) and it can be turned on the screw $f^1$ as its axis. The disk is so placed as to overlap the bobbin; and it is cut away on one side, as shown at $f^3$, so that, when it is turned far enough to bring the cut-away portion opposite the bobbin, the latter will be released, and can be removed from the shuttle. Beneath the disk I place a coiled spring, $f^4$, to press outward against the disk. This is not absolutely essential, but I prefer it, both in order that the disk may remain in any position in which it is placed, and

that it may also, by being screwed down more or less toward or upon the bobbin, act as a tension on the bobbin-rim. In a recess in the shuttle, on the side of the bobbin opposite the holding-disk, is a tension composed of two dished plates, $g$ $g^1$, arranged as shown in Fig. 2, the under one encircling a stud, $g^2$, to which the upper one is fastened by a screw, and being pressed toward the latter by a spring, $g^3$. There is space enough between the rim of the upper plate $g$ and the side of the recess to permit the passage between the same of the thread from the bobbin. The recess in which the tension is located opens into the recess $d$, which contains the bobbin, as indicated in Fig. 3; and from the tension-recess there also extends a groove, $h$, along the side of the bobbin-recess and across the thread-hole, dividing the same into two parts, $c$ and $c'$. The thread from the bobbin passes around the tension, and thence along the groove $h$ through the hole $c$ or $c'$, according as the thread is to pass out on the back or the front of the shuttle.

When the shuttle-thread passes out at the back of the shuttle—that is, along $h$ and through $c$—the simple or ordinary lock-stitch will be formed when the shuttle is used with the other elements of a sewing mechanism—to wit, a feed, a cloth-plate, and a needle carrying an upper thread. When, however, the shuttle-thread passes out at the front—that is, along $h$ and through $c'$—a lock-stitch will, under like conditions, be formed which has other characteristics—that is to say, the shuttle, when in motion, will be caused to pass over its own thread, and the upper or needle thread will thereby be twisted, making what I call a twisted lock-stitch, a stitch much tighter and more secure than the plain lock-stitch, and indicated enlarged in diagram, Fig. 8, the plain lock-stitch being indicated in a similar diagram, Fig. 7.

In order to thread the shuttle for the plain lock-stitch, take the end of the thread from the bobbin, which has not yet been placed in the recess $d$, and pass it from the front of the recess $d$ through the part $c$ of the thread-hole, so that it will emerge from the back of the shuttle; pull through about four or five inches of thread, holding the shuttle and thread thus pulled through with the left hand, and then, holding the bobbin in the right hand, pass its thread around the tension, pulling it down between the rim of the upper tension-plate and the side of the tension-recess. Then place the bobbin in its recess, first winding upon the bobbin any slack thread, and lock it in place by means of the holding-disk $f$.

To thread the shuttle for the twisted lock-stitch, the end of the thread from the bobbin is first passed through from the front and out through the back of recess $d$; then, turning the end of the thread, pass it back through recess $d$ into and through the part $c'$ of the thread-hole, so that it will emerge from the front of the shuttle. Then fit the thread to the tension, and put the bobbin in place, as above explained.

The shuttle holding and propelling devices are clearly shown in Figs. 1, 2, and 4.

The shuttle is received by a cylindrical holding socket or cup, A, provided with a balance heel or stub, $i$, so formed and located that, when the shuttle is slipped into the holder it (the heel or stub) will fit in the recess $a$ between the points of the shuttle. The top or outer edges of this stub are rounded off, as shown in Fig. 4. By reason of this stub or heel the shuttle will be caused to follow the movement of the holder when the latter rotates. From the rear of the holder projects a rod, B, which fits and is capable of sliding in a tubular shaft, C, supported in a bearing, D, designed to be attached to the sewing-machine, underneath the cloth-plate. The end of tube C, in front of the bearing D, is split or slotted, as shown at $j$, Figs. 1 and 2, and into this slot projects a pin or spline, $k$, from rod B, so that the latter, while capable of sliding longitudinally in the tubular shaft, must follow the rotary movement of the same. The sliding movement of the rod B is limited in the one direction by means of a check-nut, E, screwing on the screw-threaded front end of tubular shaft C, in the path of the pin or spline $k$; and this nut can be adjusted back and forth to prevent the rod B and holder A from advancing further than the distance desired; and in the other direction it is controlled by a spring, $l$, within the tubular shaft C, which tends to press the holder A forward. The pressure of the spring for this purpose may be regulated and graduated by means of the adjusting or regulating set-screw $m$, screwing through a plug in the rear end of shaft C, and bearing against the rear of the spring. Upon the shaft C is a pinion, $n$, designed to gear with a cog-wheel on the main shaft of the sewing-machine, from which the rotary movement of shaft C, and consequently of the holder and shuttle, is derived. The holder is pressed toward a plate, F, between which and the holder the shuttle is held. This plate is connected with the bearing D by a suitable arm or frame, G, and is provided with a longitudinal slot for the passage of the needle, which is designed to pass down through this slot, and so that the shuttle, when working against the face of this plate, will, by means of one of its points, $b$, take, or pass through, the loop from the needle in making the stitch. This plate is of annular formation, as shown—that is to say, it is so cut away as to be in contact only with the outer portion of the shuttle toward the rim; and this construction is advantageous on several accounts: It lessens friction on the shuttle; prevents the friction on the two threads which would otherwise take place in making the twisted lock-stitch, and prevents

liability of the point of the shuttle, in making this stitch, picking up the shuttle-thread with the needle-thread—an event which might otherwise occur, especially in view of the fact that the face of the shuttle upon which the two threads are in making this stitch is flat and works close against the plate F. The arrangement of the check-nut, adjusting-screw, and spring, above described, in connection with the holder and plate F, allows the pressure with which the shuttle receiver or cup holds the shuttle against the plate F to be accurately adjusted and regulated. The holder can be drawn back readily either to permit the insertion or withdrawal of the shuttle; and, indeed, no care is required in order to insert the shuttle. It can be pushed in between the plate and the holder, and, even if its points do not at first embrace the heel or stub *i*, this will take place as soon as the machine is put in motion. Both the back of the shuttle and the stub are rounded, as above stated, and the rim of the cup or holder is high enough to hold the shuttle, even if the latter be not exactly placed; and when the machine is put in motion the holder will revolve, the shuttle remaining at rest until the heel *i* comes opposite its recess *a*, when the shuttle instantly falls into place and partakes of the rotary movement of the holder.

The above-described devices are, of course, only one part of a sewing mechanism; but those skilled in the art to which this invention relates will understand without further explanation the manner in which the same are to be applied and used.

The shuttle, as before said, is double-pointed, and is adapted to revolve and do its work in either direction.

Having now described my invention and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. A double-pointed crescent-shaped rotary shuttle, having its center or axis of motion within its body, and pierced axially with a thread-hole, which extends from front to back, and communicates intermediately with the bobbin-receptacle, substantially as described, whereby the thread from the bobbin may be caused to pass out either at the front or back of the shuttle, for the purposes set forth.

2. In a shuttle of the kind described, in which the thread-hole is formed and arranged as specified in the preceding clause, a bobbin-receptacle extending entirely through the shuttle from front to rear, substantially as and for the purposes set forth.

3. The arrangement in the shuttle of the herein-described bobbin, tension, and bobbin-locking plates, substantially in the manner set forth.

4. The shuttle holder or cup and its supporting-rod, in combination with the tubular rotary shaft, in which said rod fits and slides, and the check-nut and spring and adjusting-screw, for regulating the movement of said holder, the parts being constructed and arranged substantially as shown and set forth.

5. In combination with the shuttle-holder and devices for holding and operating the same, the annular plate toward which the holder is pressed and between which and the holder the shuttle when in place is supported, substantially as shown and described.

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

JOSEPH LEONARD FOLLETT.

Witnesses:

A. G. GOLDTHWAIT,

WM. F. HART.