

E. H. SMITH.  
Sewing Machine.

No. 12,754.

Patented April 17, 1855.

Fig: 1.

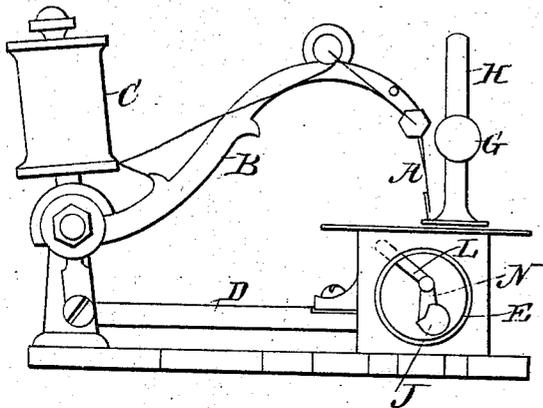
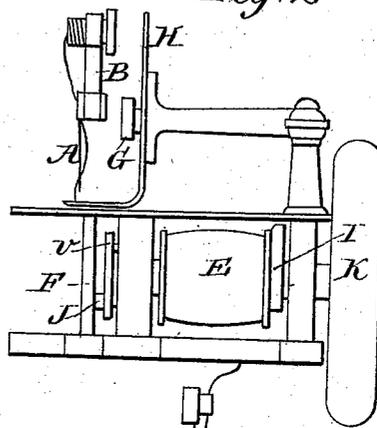
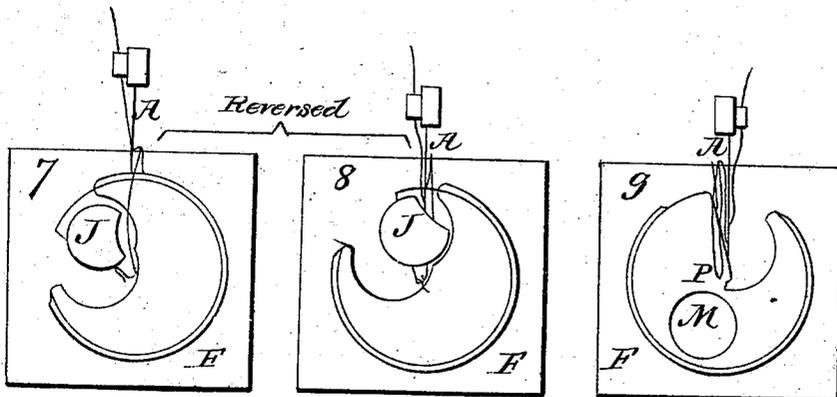
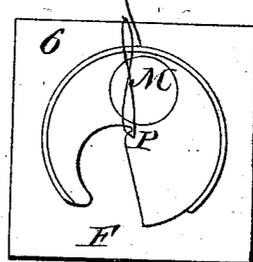
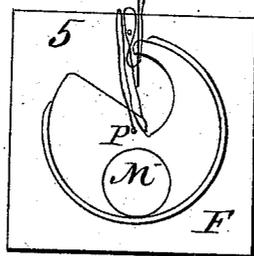
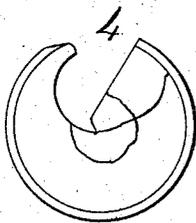


Fig: 2.



M



# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 12,754, dated April 17, 1855.

*To all whom it may concern:*

Be it known that I, E. HARRY SMITH, of the city, county, and State of New York, have invented a new and useful Improvement in Sewing-Machines; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which make a part of this specification, in which—

Figure 1 represents a side elevation. Fig. 2 represents a front elevation. Figs. 4, 5, 6, 7, 8, and 9 represent the operation of the shuttle in forming the stitch.

Like letters refer to the same parts.

A is the needle. B is the needle-arm. C is the spool from which the needle-thread is taken; D, eccentric-follower; E, pulley-driver; F, shuttle-bearing; G, screw for holding the cloth-holder; H, a slide for holding the cloth; I, eccentric; J, shuttle-driver; L N, arms by which the shuttle is governed; K, balance-wheel; M, shuttle-bobbin.

To enable others to make and use my invention, I will describe its construction and operation.

The nature of my invention consists in the employment of a circular rotative shuttle having its bearings in its periphery, and constructed so as to open a loop of the needle-thread, pass a bobbin through it, and retain it until the next ascent of the needle and the formation of another loop, preparatory to the commencement of a succeeding stitch. To accomplish this I use a disk of metal, ivory, or other suitable material, of about the proportion of two inches diameter to half an inch in thickness, which, after having been fitted into the ring F, Fig. 1, is partly cut away on one side, so as to leave it in the form of a lune, as shown in Fig. 4. One horn of the lune is tapered off, forming a point for opening the loop of the needle-thread, while a piece is left on one side of the other horn, and formed into such a shape as to receive the loop, when it is drawn off the body of the shuttle, and retain it until the next ascent of the needle and the commencement of the next stitch. Thus the two ends are brought opposite each other, or in juxtaposition. Owing to this arrangement of the two ends, it will be perceived on reference to the two drawings, Fig. 5, that unless some means are used to prevent it, the point,

in entering the loop *o* behind the needle, will be in danger of catching into the previous loop as it is released from the heel. This is prevented by setting the point back, as it were, from the heel, in a line corresponding with the longitudinal axis of the shuttle—that is to say, in such a manner that the circumferential lines of the heel and point will pass each other, thus giving the shuttle, as a whole, a kind of spiral or screw form. The heel is thus made to act as a guard to prevent the point from entering the same loop a second time as it advances to take the next loop *o* from the needle. (See Fig. 5.) A cavity is turned in one side of the shuttle, into which a bobbin, M, is inserted. The thread from this bobbin is passed through a small hole in the center at P, Figs. 5, 6, and 9, around which the shuttle is rotated, by which arrangement a difficulty is obviated which has heretofore attended the use of a rotary shuttle in the formation of a slack thread between the shuttle and the cloth.

A second feature of novelty is embodied in the method of giving the shuttle a rotative motion continuously in the same direction, (which requires that the operating medium should be kept continually in contact with the shuttle,) and yet allow it to pass freely through the loop. This result I attain by the use of an alternating driver, having two bearing-points, which are alternately removed from the shuttle to allow the thread to pass. It consists of a button, J, with a portion removed from one side of its periphery, giving it a form similar to the shuttle. It is fitted into a concave curve in the back of the shuttle, which corresponds exactly with the convexity of the periphery of the button, thus leaving a small space between it and the shuttle, as shown in Fig. 7. It is caused to change its bearing-points by means of two arms, L N, one end of one arm being attached by a pin to a support, while one end of the other is attached to the button, and the two arms are also attached to each other, all being as represented in Fig. 2. A pin passes through the center of the button, and secures it to the disk seen in Fig. 2, (marked U.) In this figure the arms L N are not shown. The button is not, however, rigidly attached to the disk, but is allowed to turn on the pin which forms its axis in any direction which

the arms L N may move it. Thus it will be understood that the button J has two different movements—one around the center of the shuttle, for the purpose of giving the shuttle its rotary motion, and one on its own axis, to remove alternately the bearing-points and allow thread to pass. By this arrangement the shuttle is made to pass through the loop and the thread caused to slip off the shuttle without interference with the medium by which it is propelled.

The remaining parts I shall not describe in detail, as they do not essentially differ from the other shuttle sewing-machines heretofore constructed.

**Operation:** The needle being passed through the cloth, in its withdrawal throws out a small bow or loop *o*, Fig. 5. The shuttle, owing to its adjustment in relation to the movements of the needle, is made to catch this loop, open it, and pass a bobbin through it, as in Fig. 6. The needle now begins to descend, and, passing through the cloth, takes up a part of the loop which is around the shuttle, drawing it in between the shuttle and the button J, by which it is propelled, Fig. 7. As the shuttle continues its revolution and the needle its descent, the button J is turned on its axis, or made in any way to assume the position shown in Fig. 8, when the loop is entirely released from the button J and allowed to be drawn off the shuttle, and remains around the heel, as in Fig. 8, until the needle again ascends, when the point of the shuttle enters a second loop, as in Fig. 5. As the shuttle continues its revolution, the first loop is slipped off the heel and drawn up by the enlargement of the second. Thus every stitch is tightened by

passage of the shuttle through the loop which is to form a part of the succeeding stitch.

I shall not confine myself to any special mode of operating the button J, by which the shuttle is driven, but shall use any means which will cause it to assume such a relation to the shuttle as to allow the shuttle to pass freely through the loop.

It may be well to state that I am aware that machines have been before constructed in which a rotary shuttle has been used, and also that a machine has been made, which is the subject of a patent granted to Allen B. Wilson, and dated June 15, 1852, in which a combination is used of a bobbin with a rotating hook, which operated upon the loop in such a manner as to throw it over the bobbin; but I would have it understood that I make no claim to any such rotating hook, or any rotary shuttle, except that represented and described in the accompanying drawings and specification.

I therefore claim as my invention and desire to secure by Letters Patent—

1. A discoidal shuttle having its bearings in its periphery and revolving around its own axis, when constructed substantially in the manner and of the form described.

2. As a means of propelling the shuttle, the employment of the lunc-form button, constructed as described, which has a movement on its axis, in the manner set forth, for the purpose of allowing the thread to slip alternately into and out of the concave in its periphery, and thus pass off the shuttle.

E. HARRY SMITH.

Witnesses:

JAS. B. BENSEL,  
A. LUDLOW.