2 Sheets—Sheet 1.

L. EVANS.
Sewing-Machine.

No. 209,030. Patented Oct. 15, 1878

Fig. 1.

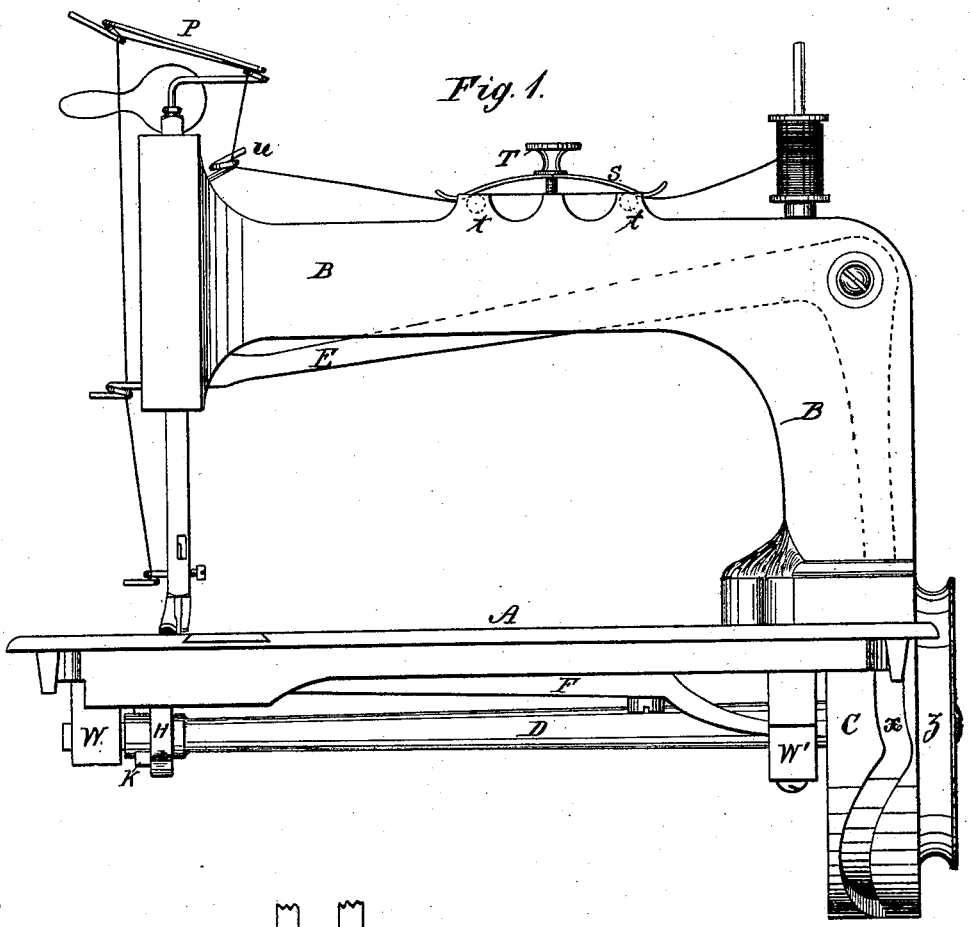

Fig. 6.

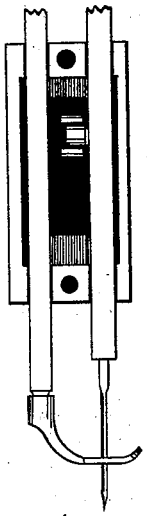

Fig. 5

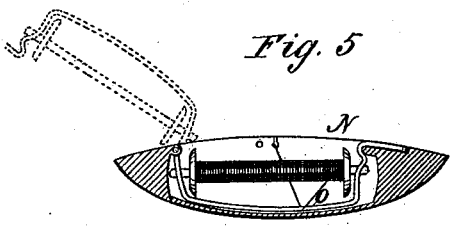

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Fig. 2.

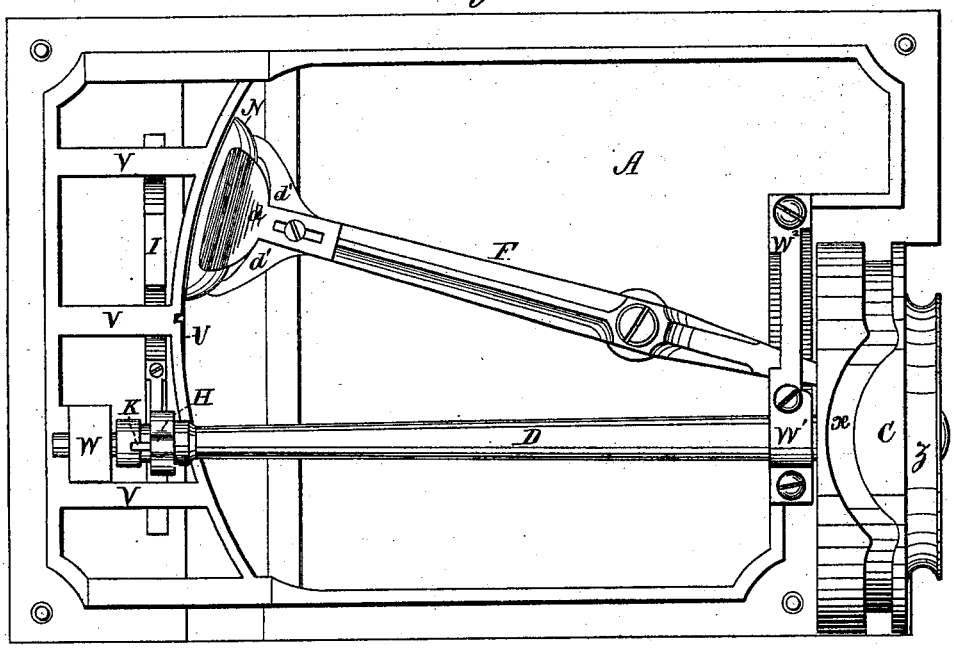


Fig. 4.

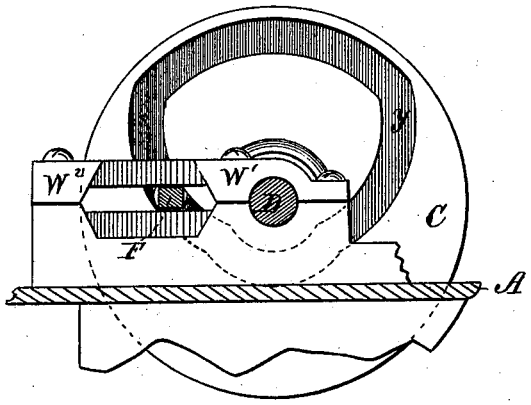
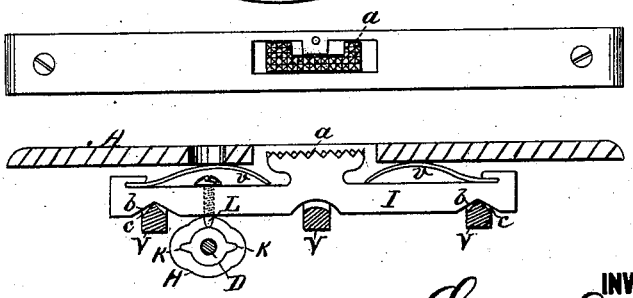


Fig. 3.



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UNITED STATES PATENT OFFICE.

LOUIS EVANS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF, JOHN J. THORNTON, DANIEL H. RIDGEWAY, AND W. E. TUSTON, OF SAME PLACE.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **209,030**, dated October 15, 1878; application filed November 28, 1877.

To all whom it may concern:

Be it known that I, LOUIS EVANS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Sewing-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side view; Fig. 2, an inverted plan; Fig. 3, details of the feed mechanism. Fig. 4 is a transverse sectional view, showing the side of the fly-wheel with cam-groove; Fig. 5, a detail of the shuttle; Fig. 6, end view of the arm with face-plate removed, showing needle and presser-foot bar.

My invention relates to certain improvements in sewing-machines of that class which have a double-pointed shuttle and are adapted to sew either backward or forward by a simple reversal of the machine.

The object of my invention is to provide as simple, cheap, and durable a machine of this class as possible by combining in a few elements the necessary functions of the machine.

The improvements consist in the peculiar construction and arrangement of the feed devices; in the peculiar arrangement, in the shuttle, of a spring bobbin-holder hinged to the shuttle, and bent so that its bowed portion folds inwardly, and by binding the thread between the same and the inside of the shuttle forms also a tension; and in the peculiar construction and arrangement of a take-up located upon the needle-bar, which take-up is constructed with a view to an increased amount of flexibility in a given space, as well as with a view to securing by a simple construction an increased degree of retraction for the thread, all as hereinafter more fully described.

In the drawing, A is the bed-plate, which rests upon the table, and to which all the parts are attached. B is the arm which supports the needle-bar and presser-foot. C is the fly-wheel, which is of a compound character—that is to say, it is formed with a cam-groove, *x*, upon its periphery, in which the end of lever E rests, and is thereby actuated to give motion to the needle-bar, and has another cam-groove, *y*, in its side, as shown in Fig. 4, which gives motion to lever F, that carries the shuttle, and is also cast with a grooved pulley, *z*, upon the opposite side, which receives the driving-band. This part C, then, of the machine combines in one device the functions of a fly-wheel, the needle-bar cam, the shuttle-cam, and the driving-pulley. In locating the cam-grooves *x* and *y* upon the fly-wheel they are so relatively arranged that when one lever is in motion the other is at rest, whether the wheel is running backward or forward, thus adapting this part of the machine to the making of a stitch with each movement of the shuttle.

D is the shaft to which the fly-wheel is attached, which shaft also carries at its opposite end the double eccentric or feed-cam H. This shaft is journaled in hangers formed upon the under side of the bed-plate, of which hangers the one, W, next to the eccentric is a closed bearing without removable cap, while the one next to the fly-wheel has a removable cap-piece, W^1, which is extended at W^2, Figs. 2 and 4, and fastened by screws, so as to inclose and form (in connection with an extension of the hanger) a guide for the oscillating end of the shuttle-lever.

I is the feed-bar, Fig. 3, formed with a serrated surface adapted to project through a slot in the bed-plate and bite the cloth. Upon each side of the serrated surface the bar I is extended beneath the bed-plate with a corresponding or symmetrical construction, having springs *v v* interposed between the bed-plate and the feed-bar, which serve to depress the latter, and having also angular notches *b b*, which rest upon angular seats *c c*. As the feed-cam H upon the shaft revolves the eccentric portions of the same bear against and lift the feed-bar I until its serrated surface bites the cloth, while the projecting tappets K on the said eccentric strike a screw, L, upon the feed-bar I to give the latter the necessary longitudinal movement. The bar I is brought back to its former position by the combined agencies of the springs *v v* and the inclines *b* resting upon the seats *c*, the said springs serving to depress the feed-bar, while the inclined faces beneath divert the bar longitudinally to the point whence it started.

The symmetrical arrangement of the bar I with its inclined supporting-faces and the double eccentric with its tappets K K together adapt the feed to either a forward or backward movement in sewing upon the same principle, and without any other adjustment than the mere reversal of the machine.

To adjust the length of stitch, the screw L is raised or lowered to increase or diminish the time of its engagement with the tappets on the eccentric, and for this purpose the head of said screw is made accessible to a screw-driver by means of a hole cut in the bed-plate directly over the same.

N, Figs. 2 and 5, is the shuttle, pointed at both ends, so as to pass through the loop either way, and thus make a more perfect and durable stitch. This shuttle is held to the lever F by a shuttle-holder, *d d'*; made of heavy sheet metal, in which *d* constitutes the support for the same, while *d' d'* are wings bent round first at right angles, to form a socket for the end of the lever, and then bent at right angles again into a plane parallel with the plane of *d*, to hold the shuttle in and define its longitudinal play.

The socket portion of the shuttle-holder, which embraces the end of the lever, is adjustably held thereto by a slot and set-screw, as shown in Fig. 2.

O, Fig. 5, is a light spring, bowed to fit in the shuttle, hinged to the same at one end, so as to fold outwardly, and adapted to be fastened at the other by a slight bend, which engages with a lip on the shuttle to form a spring-catch. This spring O is provided with a hole at each end, which holes form bearings for the ends of the bobbin, and into which the said bobbin is sprung. When the spring is closed down into the shuttle and clasped by its catch, it holds the bobbin securely in the shuttle, and forms also a tension for the thread, which passes between the spring and shuttle, as shown in Fig. 5.

I only claim this spring-bobbin when bent and hinged so that its bowed portion fits into and corresponds with the curvature of the inside of the shuttle. In this position it will be seen that the bowed portion of the said spring binds the thread between the same and the shuttle, and thus forms a tension without threading through holes in the said bobbin-holder.

P, Fig. 1, is a spring set in the top of the needle-bar, and arranged to take up the slack and tighten the stitch without breaking the thread.

I do not claim, broadly, the location of a spring upon the needle-bar to constitute a take-up; but my particular form of spring has a peculiar action and merit. It will be observed that it is cheaply constructed of a single piece of bent wire. To give it, however, a sufficient range of action to accomplish the desired result, I bend it first horizontally to one side of the needle-bar, then into several coils to form both an eye and a spring, and then extend it again upon the other side of the needle-bar, and then bend it into a second eye. As this spring rises, it will be seen that much more slack is taken up than would be taken up by a single eye, because of the distance between the two eyes, while the range of movement of the spring is equal to the flexibility of the upper horizontal portion added to the lower horizontal portion. This form of spring, in connection with a stationary eye, *u*, for the thread, gives the necessary range of movement to permit the successful use of a take-up on the needle-bar, and yet occupies but comparatively little space.

S is a flat or semi-elliptical spring, resting at its extremities upon small rollers *t t* on the top of the arm, and held and adjusted, as to its tension, by a set-screw, T, to regulate the tension of the upper thread, which passes between the spring and the rollers.

In constructing the bed-plate of the machine, the curved flange U, Fig. 2, struck from the pivot of lever F as a center, constitutes the shuttle-race, and the re-enforcing-ribs V for the same serve as supports for the feed-bar.

From the foregoing description it will be seen that I have constructed a machine combining great simplicity and compactness of parts, still preserving for the same the functions of forming a stitch at every movement of the shuttle and of sewing in either direction, thus obviating much time and trouble occupied in turning the work or breaking and commencing the stitch.

Having thus described my invention, what I claim as new is—

1. The feed-bar having a raised serrated middle portion and double inclined notches upon each side, in combination with stationary angular seat upon each side, vertically-operating springs, and devices for imparting motion to said feed-bar, substantially as described.

2. The symmetrically-constructed feed-bar I, having double inclined notches *b*, in combination with springs *v*, arranged upon each side of its serrated face, as set forth, so as to bear laterally against the work-plate, and with stationary angular supporting-seats and an actuating-cam, substantially as described.

3. The combination, with the shuttle, of the bent-spring bobbin-holder O, hinged to said shuttle, with the bowed part folding inwardly to bind the thread between the same and the inside of the shuttle, and form a tension, substantially as described.

4. The combination, with a stationary eye or thread-guide, *u*, of the spring P, located upon the needle-bar, and bent first upon one side and then upon the other of the said needle-bar to form coils, substantially as described.

LOUIS EVANS.

Witnesses:
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HENRY A. WEAVER.