J. BENNOR.

Sewing Machine.

No. 106,249. Patented Aug. 9, 1870.

Fig. 1,

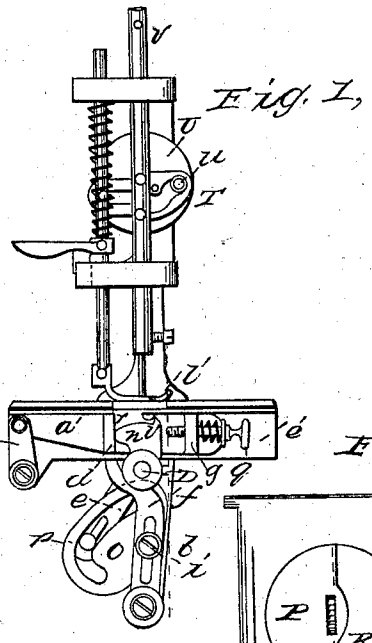


Fig. 4,

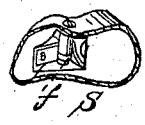


Fig. 3,

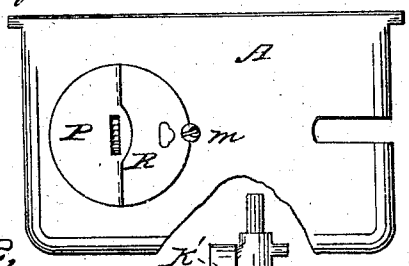
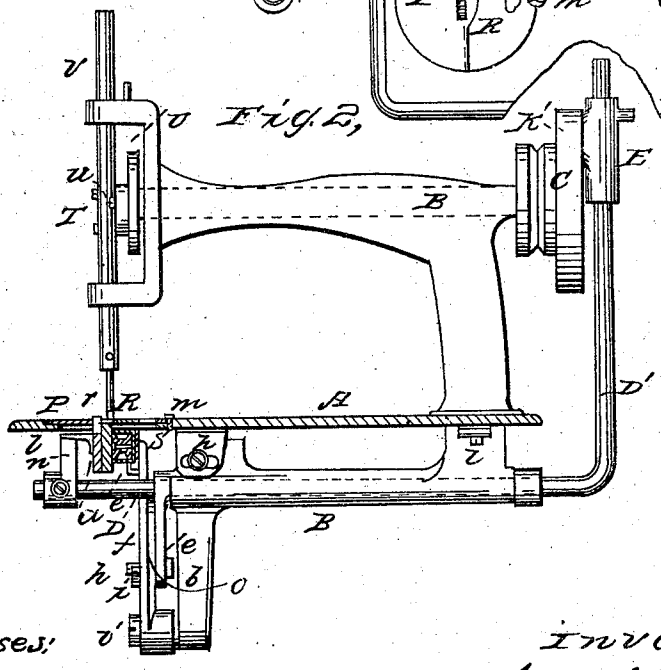


Fig. 2,



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UNITED STATES PATENT OFFICE.

JOSEPH BENNOR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND ABRAHAM REX, OF SAME PLACE.

IMPROVEMENT IN SEWING-MACHINE.

Specification forming part of Letters Patent No. **106,249**, dated August 9, 1870.

To all whom it may concern:

Be it known that I, JOSEPH BENNOR, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, making part of this specification, and to the letters of reference marked thereon, like letters indicating like parts wherever they occur.

To enable others skilled in the art to construct and use my invention, I will proceed to describe it.

My invention relates to sewing-machines; and the invention consists in certain novel features of the mechanism for operating the various parts, and the means of adjusting portions of the mechanism, all as hereinafter more fully explained.

Figure 1 represents a front-end view of my improved machine. Fig. 2 is a side elevation of the same with a portion shown in section. Fig. 3 is a plan view of the cloth-plate, and Fig. 4 is a perspective view of the shuttle detached.

In constructing my improved machine I make a cast-iron bed-plate, A, with a transverse flange, *e'*, projecting vertically from its under side near the front end, and with a lug, *h*, also projecting from its under side, as shown in Figs. 1 and 2. I then provide a frame, B B', cast in a single piece, to support the operating mechanism, and secure it to the bed-plate A by means of a screw in the lug *h*, and another screw, *l*, which passes through a lug or flange on B' and presses against the under side of the plate A, as shown in Fig. 2, there being a slot, as represented in Fig. 3, in the rear end of plate A, to permit the frame B to be inserted, as represented.

The lug *h* on the plate A is slotted where the screw passes through it, so as to permit the frame B and the plate A to be adjusted relatively to each other, as shown in Fig. 2.

The main or driving shaft passes longitudinally through the arm *b* of the frame, and has secured to its rear end a pulley, C, and at its front end a disk, U, as shown in Fig. 2.

The needle-bar V plays vertically in bearings on the front end of arm *b*, and has secured rigidly to it a slotted cam, T, of the form shown in Fig. 1, in which cam moves a pin, *u*, which projects from the face of the disk U. This cam T is made of such a form that the needle-bar remains stationary during a portion of the revolution of the driving-shaft, the parts being so arranged that this shall occur at the time the shuttle is passing through the needle-loop.

There is a point, *o'*, formed on the upper side of the slot in cam T, which raises the needle slightly just previous to the arrival of the point of the shuttle at the needle, the object being to open the needle-loop by thus raising the needle a little, so as to enable the shuttle to enter it more readily.

Through the lower arm, B', of the frame I pass a rock-shaft, D, as represented in Fig. 2, which shaft operates the shuttle and the feeding mechanism, this shaft itself being operated by having its rear portion bent at a right angle to form an arm, D', which extends up alongside of and is connected to the outer face of the driving-pulley C by a slide, E, which latter is pivoted to the pulley C by a pin, *k'*, as shown in Fig. 2.

As the pulley C revolves, the slide E plays up and down on the arm D', and as the slide E is carried around by the pulley it imparts a reciprocating movement to the arm D', and through it to the rock-shaft D.

The feeding device consists of a small bar, *a'*, placed against the front side of the flange *e'*, as represented in Figs. 1 and 2. This bar *a'* has the usual serrated device or pawl *r* projecting up through a slot in plate P, for taking hold of the cloth, and it has also projecting laterally from its outer surface three arms—one, *d'*, behind the shaft D, another, *l'*, over the shaft, and a third, *g'*, in front of the shaft, all as represented in Fig. 1.

To operate this feed I secure upon the outer end of shaft D an arm or driver, *n*, which has an incline, *v*, at its right-hand upper corner, as represented in Fig. 1, and a toe or projection on its left-hand face. The feed-bar *a'* and this driver *n* are so proportioned and arranged that as the driver is moved by the rock-shaft D the incline *v* is pressed forward under the arm *l'*, thereby elevating the pawl *r*, causing

it to take hold on the cloth, and then the toe of the driver strikes against the arm d', thereby shoving the bar a', with the feed r, forward, feeding along the fabric in the usual manner.

By the reverse movement of the driver n the incline v is first drawn from under the arm l', thereby letting the feed or pawl r drop down away from the cloth, and then the rear face of the driver strikes against the end of a screw, q, which projects through the arm g', and thereby carries the bar a', with the pawl r, back, ready to make another stitch. By adjusting the screw g' the length of stitch is regulated as desired.

The laterally-projecting arm l' of the feed-bar a' is made inclined longitudinally on its under side, and the driver n is made adjustable on the shaft D, so that by moving the driver n in or out the feed-bar a' will be raised more or less by the driver n, and thus, by simply moving or adjusting the driver on the shaft D, the teeth of the feed-bar may be made to protrude but slightly above the face or bed plate for sewing thin fabrics; or, by moving the driver in the opposite direction, they may be made to protrude more for thick fabrics, and may also be adjusted to compensate for wear.

The shuttle-carrier is connected rigidly to the upper end of an arm, f, which is pivoted at its lower end to an arm, b, which projects vertically from the front end of the arm B′ of the frame, as shown in Fig. 2, the shuttle-carrier thus moving in the arc of a circle, of which the pin o', that secures it to the arm b, is the center.

To the arm f of the carrier I attach, by a screw, i, a plate, o, in which is formed a curved or cam groove or slot, as represented in Fig. 1. Upon the shaft D′, in rear and alongside of this plate o, I secure an arm, e, as shown in Fig. 2. This arm e is slotted near its lower end, and in this slot I secure a stud or pin, p, the end of which passes through the cam-slot in plate o, as shown more clearly in Fig. 1. As the rock-shaft D vibrates, the arm e is made to move also, and it, in turn, communicates motion to the arm f of the shuttle-carrier, and thereby to the shuttle also. The throw of the shuttle may be increased or decreased at will by simply adjusting the pin p in the slot in arm e, and by adjusting the plate o on the arm f the motion of the shuttle may be varied as desired.

By curving the lower end of the slot in plate o, as shown in Fig. 1, the pin p, during the latter portion of the movement of arm e, will pass around into this curved portion of the slot, and thereby cease to move the shuttle, which will therefore remain stationary for a short time just as it has completed its forward movement. The motion of the shuttle is so timed in relation to the motion of the needle-bar that just as the shuttle has thus completed its forward movement the needle-bar is completing its upward movement, and thus the shuttle remains stationary while the needle-bar draws up the needle-thread and tightens the stitch or locking together of the two threads.

The shuttle, which is shown detached at Fig. 4, is made short, and pointed at one end only, and it has a screw, f', passing through it vertically just in front of the bobbin, which lies across its rear end. This screw f' has a hole transversely through it, and the thread from the bobbin passes through this hole, so that by turning the screw the thread may be wound around the screw more or less, and the tension of the shuttle-thread be thus regulated, as desired. As this screw is placed vertically with its head at the upper side of the shuttle, it will be apparent that the tension of the shuttle-thread can thus be adjusted at pleasure without removing the shuttle from the carrier, thereby saving much time and trouble.

In order to give ready and convenient access to the shuttle for the purpose of changing the tension, and also for taking out and replacing the shuttle, I cast the bed-plate A with a circular opening over the place where the feed and shuttle work, and insert therein a cloth-plate of the form represented in Fig. 3. This cloth-plate I make of two pieces—one part, P, being secured permanently in place, while the other part, R, is made removable. The part R has its edge beveled off, so as to fit under the correspondingly-beveled edge of the plate P, as shown in Fig. 2, and by the dotted lines in Fig. 3. On the opposite edge of this part R is located a screw, m, which has an eccentric head, so that when turned partly around the head will engage over the outer edge of the plate R and hold it down. When it is desired to remove the plate R it is only necessary to give the screw m a half-turn, when the plate can be at once lifted out, there being a hole in it for that purpose.

By these several improvements I am enabled to produce a machine that is simple and efficient and that operates in a very superior manner.

Having thus described my invention, what I claim is—

1. The bed-plate A, having slotted lugs h and shuttle-guiding face e', and the frame B B′, when constructed and combined substantially as described, so that the frame and bed-plate can be adjusted, the one to the other, as set forth.

2. The rock-shaft D, having the arm D′, and provided with feed-operating cam n, combined with the sleeve E, pivoted to the driving-pulley C, all substantially as set forth.

3. The adjustable cam-slotted plate o, in combination with the shuttle-carrier and the operating-arm e, all substantially as described.

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Witnesses:
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