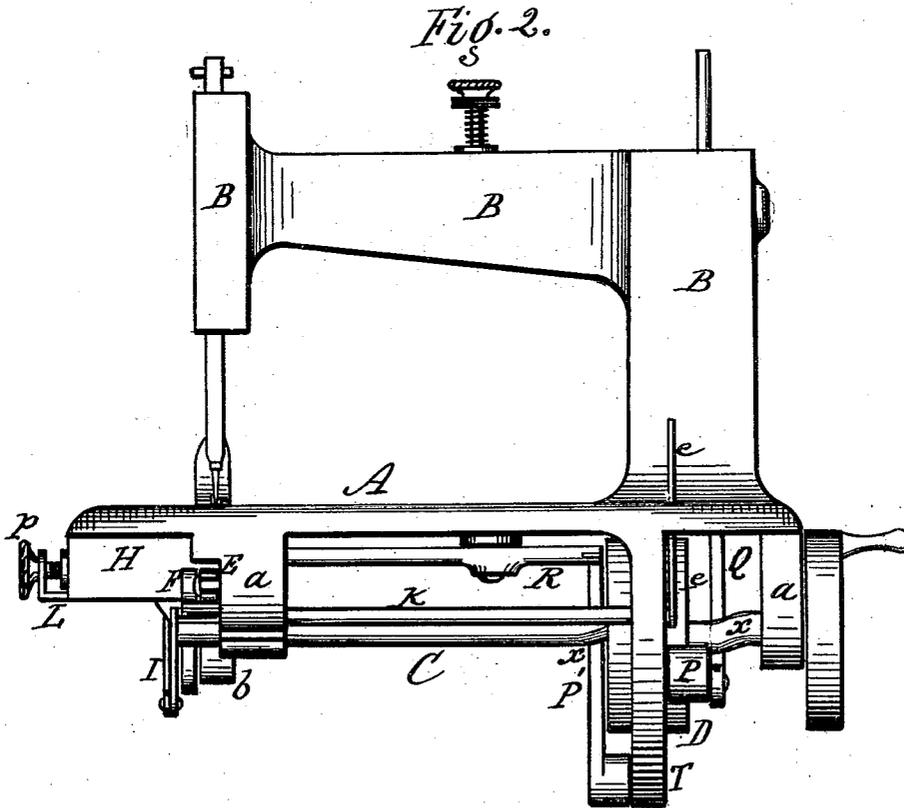
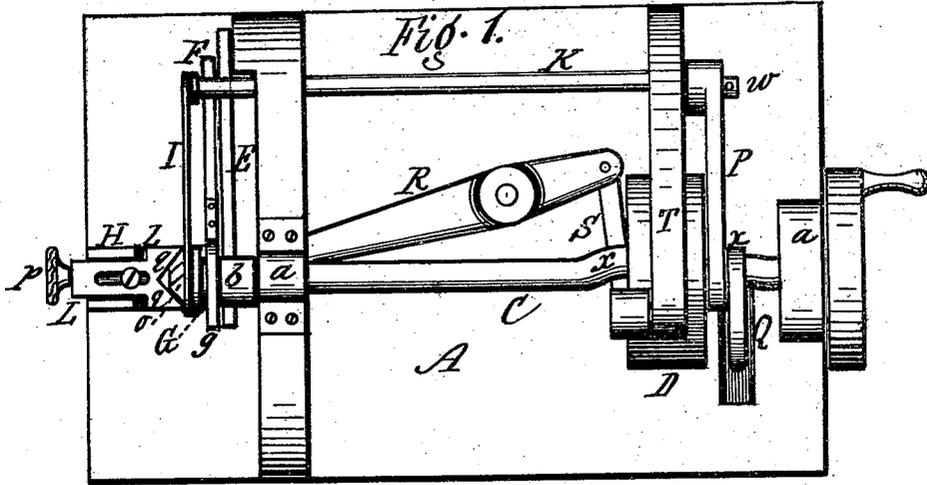


J. G. HOLLOWELL.  
SEWING-MACHINE.

No. 179,702.

Patented July 11, 1876.



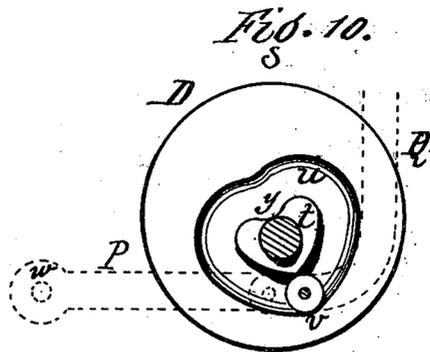
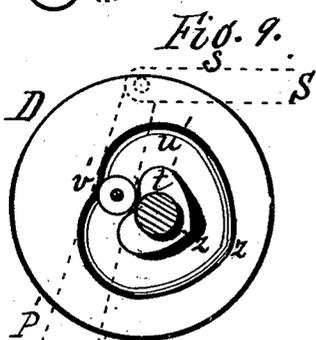
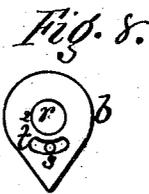
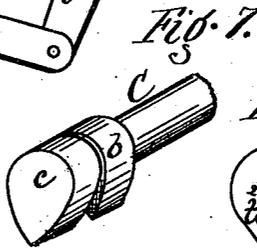
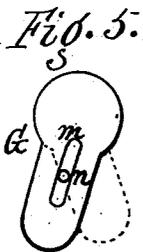
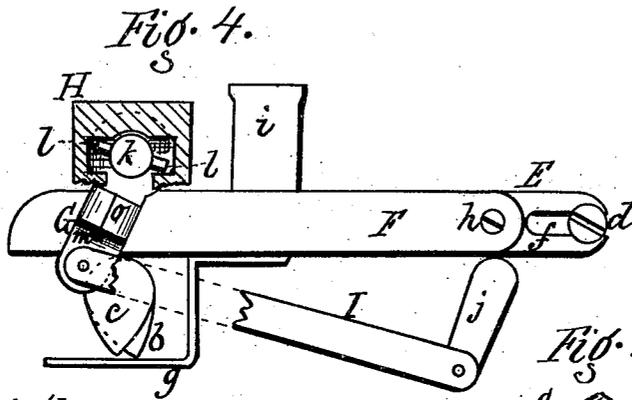
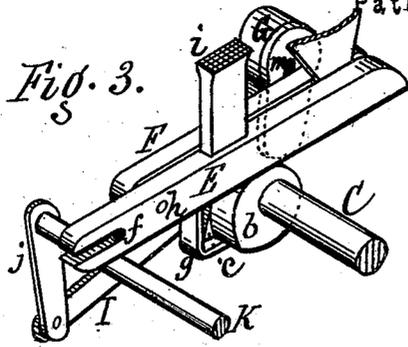
Witnesses.  
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Louis Spahn.

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# UNITED STATES PATENT OFFICE.

JAMES G. HOLLOWELL, OF PENN YAN, NEW YORK.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 179,702, dated July 11, 1876; application filed April 12, 1875.

To all whom it may concern :

Be it known that I, JAMES G. HOLLOWELL, of Penn Yan, in the county of Yates and State of New York, 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 of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a bottom view. Fig. 2 is an elevation. Fig. 3 is a perspective view of the feed arrangement. Fig. 4 is an elevation of the same, looking on the opposite side from Fig. 3. Fig. 5 is an elevation of the slotted plate for giving the longitudinal motion to the feed. Figs. 6, 7, and 8 are views of the eccentrics for operating the feed-bars. Figs. 9 and 10 are elevations of the shuttle and needle-cam, looking on opposite sides.

This invention is an improvement on that patented by me February 10, 1863, No. 37,624. The primary object is to allow the machine to run either way indifferently without danger of breaking the thread, and also to allow the work to be fed in either direction without reference to the direction in which the machine runs.

A is the bed-plate. B B B is the boxing or the stationary frame, in which the devices for operating the needle-bar are inclosed. These form no part of my invention, and I will, therefore, not describe them. C is a shaft beneath the bed, resting in bearings *a a*. It carries at one end the cam D, which serves to operate both the shuttle and needle, and at the other end two eccentrics, *b c*, which directly drive the feed-bars. The shaft C may be driven by treadle, crank-band, or any other power. E F are the feed-bars, of which two are used. The primary bar E rests at one end over the eccentric *b*, and at the other upon a stud, *d*, Fig. 4, upon which it is allowed a sliding movement by means of a slot, *f*, or equivalent. The secondary bar F rests over the eccentric *c*, and has a loop or strap, *g*, which incloses the eccentric, the opposite end of the bar being pivoted to the bar E at *h*. The bar E has a feeding-arm, *i*, which extends up through a slot in the bed-plate, as usual, and operates upon the under side of the cloth to feed it along.

G is a plate, which turns upon an axis, *k*, Fig. 4, so as to be set at an angle on either side of the vertical line, as indicated by the black and dotted lines, Fig. 5. Its range of motion is limited by stops *l l* working in grooves in the bearing-block H. *m* is a longitudinal slot in the plate, in which rests a pin, *n*, projecting from the outer side of the secondary feed-bar F. I is a connecting-rod, jointed at one end to the plate G, and at the other to the crank-arm *j* of a shaft, K, which extends to the right-hand end of the machine, and is provided with a lever, *e*, passing through a long slot in the bed-plate. By throwing this lever in one direction or the other the plate G will correspondingly be thrown to an incline one side or the other of the vertical line. *o* is a shoulder on the outside of the plate G, preferably made angular or V-shaped, as shown. L is a gage or slide, resting in the bearing-block H, and made adjustable endwise, in or out, by means of a screw, *p*, or equivalent. Its inner end is notched, so as to leave angular or V-shaped edges *q q*, between which rests the shoulder *o*. The edges *q q* form stops to the shoulder *o*, and, by adjusting the gage in or out, the throw of the plate G will be correspondingly shortened or lengthened, according as said shoulder strikes different parts of the inclines of the edges *q q*. By this means the stitches are correspondingly shortened or lengthened, as will presently be described. The eccentric *b* is fixed upon the shaft C. The eccentric *c* turns loosely upon a bearing, *r*, Fig. 8, of the shaft. The two eccentrics are connected together by means of a pin, *s*, on *c*, and a slot, *t*, in the contiguous face of *b*, in which pin *s* rests. This allows a free turning movement of eccentric *c*, to an extent equal to the length of the slot, on each side of the vertical line, as indicated by the dotted lines, Fig. 6, at the end of which movement in either direction both eccentrics turn together to operate the feed-bars.

When the shaft C is turned the eccentric *b* first strikes under the primary feed-bar E, and raises the feed-arm *i*, so as to engage the cloth. The eccentric *c* then strikes under the secondary feed-bar F, and, in elevating it, forces it forward by reason of the pin *n* resting in the slot *m* of the inclined plate G. The

slot being inclined, the elevating motion of the feed-bar cannot be given without imparting the longitudinal one; and the length of the longitudinal movement depends upon the angle at which the plate G stands. Hence, by means of the gage L, which adjusts the throw of the plate G, the length of stitch may be made long or short at pleasure.

The loop *g* serves simply to receive the contact of the eccentric *c*, to throw the feed-bars down again. As the front end of the bar E slides on the fixed stud *d*, its vertical position is not affected by the raising of the bar F, but it simply slides forward by reason of being pivoted to the bar F. Neither does it matter which way the shaft C is turned, as the feed-bars will work equally well in one direction or the other, and the feed will operate or move in the same direction, to feed the cloth one way only. To enable this to be done the eccentric *c* automatically shifts its position from one side to the other side of the center, with reference to the cam *b*, so as to strike its feed-bar after the other bar has been elevated.

To change the direction of the feed, the plate G is simply shifted to the opposite incline, and the same action of the feed-bars takes place, but feeding the opposite way to move the work backward instead of forward. The shifting action is accomplished by changing the lever *e*.

The cam D has in its opposite faces cam-grooves *u u'*, in which rest rollers *v v'*, attached, respectively, to rock-levers P P', which are pivoted at *w w* to a curved bearing, T, of the bed-plate.

The lever P operates the devices for driving the needle-bar through the medium of a connecting-rod, Q, which extends up into the boxing B. The lever P' operates the shuttle-arm R through the medium of a connecting-rod, S.

The cam-grooves *u u'* are of similar form to those described in my aforesaid patent, being bounded in the center by heart-shaped eccentrics *t t'*, and are of such shape as to give proper motions to the needle and shuttle in turning the shaft either way. The action of the cam-grooves is such as to first raise the needle a little distance, then keep it stationary a little time for the shuttle to pass, and afterward complete the upward motion of the needle, as in other machines having the cams revolve only in one direction. The form of the cam-grooves to accomplish this result can be readily laid out by a competent mechanic.

The shuttle-cam has a point or dip, *z z*, Fig.

9, at the extremity of the heart-shaped center, for the purpose of reacting or releasing the shuttle to slacken the thread when the needle is forced downward from its highest position. The shuttle begins to retract the moment the needle begins to descend, thereby releasing the strain upon the thread, and preventing the drawing of the thread below the cloth, which would occur were there no compensating device for the purpose. The roller *v'* of the shuttle-cam leaves the point *z* as the roller *v* of the needle-cam leaves the groove *y*, thereby producing the effect above described by releasing on the shuttle as motion is imparted to the needle.

The shaft C, on each side where it joins the cam D, is bent, as shown at *x x*, so as to meet the eccentrics *t t'* in such position that the latter may be made of a diameter but little larger than the diameter of the shaft itself. To thus reduce the size of the eccentrics brings them one side of the center of the cam D, as shown in Figs. 9 and 10, requiring the bending of the shaft to meet the eccentrics, or the enlargement of the eccentrics and cam, to allow the shaft to pass straight through. By thus bending the shaft I greatly reduce the size and cost of the cam, and make it more compact, occupying less space, and produce a much easier and more uniform running of the machine by reducing the leverage.

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

1. The combination, with the feed-bars E F, of the fixed eccentric *b* and adjusting eccentric *c*, whereby motion may be imparted to said feed-bars by the revolution of the eccentrics in either direction, as described.

2. The combination, with the feed-bars E F, (the latter being provided with the pin *n*), of the plate G, changeable to angles in opposite directions, and having the slot *m* to give the longitudinal motion to the feed, as shown and described.

3. The combination, with the slotted plate G, of the shoulder *c* thereon, and the adjustable gage L, provided with the angular edges *q q*, for gaging the length of stitch, as shown and described.

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

JAMES G. HOLLOWELL.

Witnesses:

D. A. OGDEN,

W. P. GAYLORD.