(No Model.) 2 Sheets—Sheet 1.

C. ZELNER.

REVERSIBLE FEED MECHANISM FOR SEWING MACHINES.

No. 267,124. Patented Nov. 7, 1882.

Fig. 1.

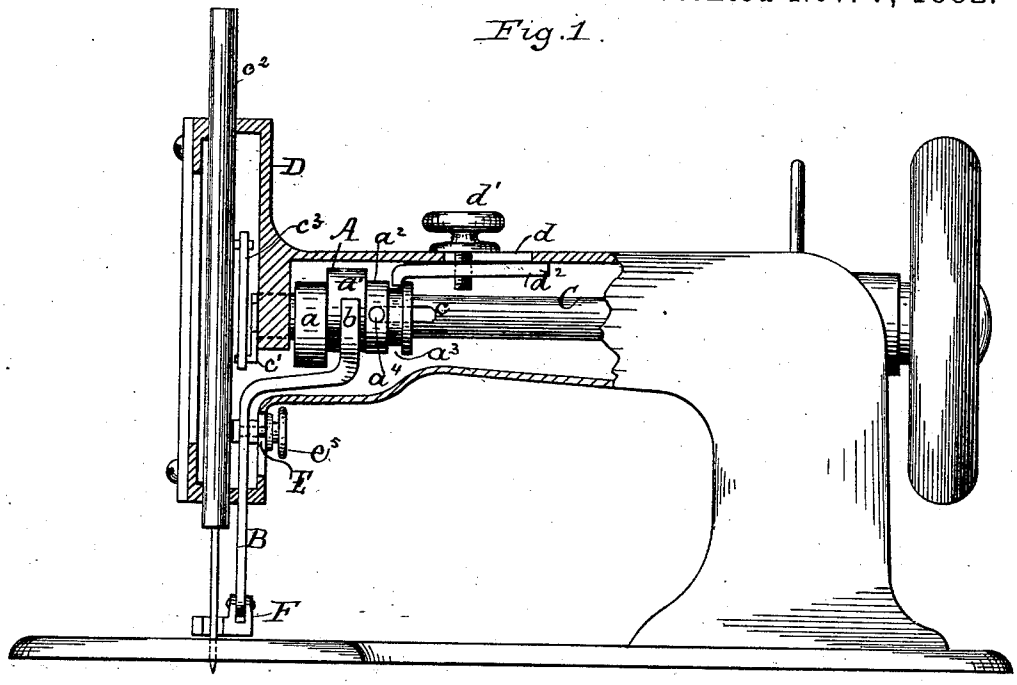


Fig. 6.

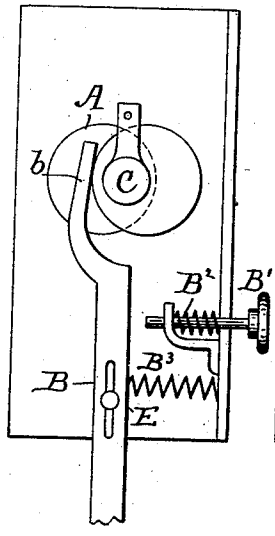


Fig. 2

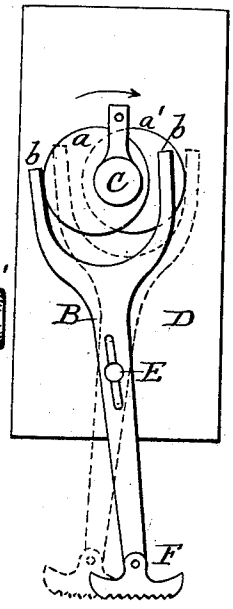
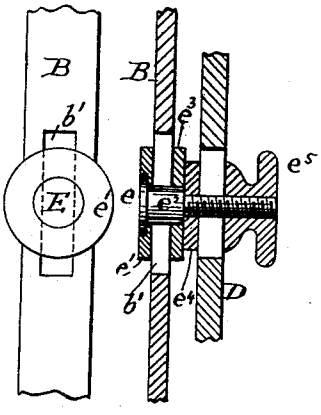


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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No. 267,124. Patented Nov. 7, 1882.

Fig. 4.

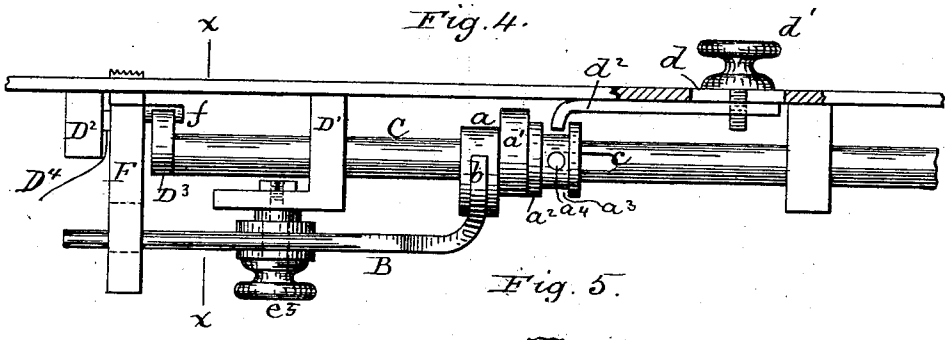
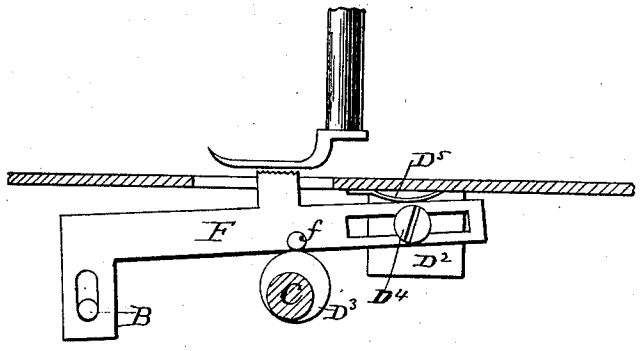


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES ZELNER, OF NEW YORK, N. Y.

REVERSIBLE FEED MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 267,124, dated November 7, 1882.

Application filed August 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ZELNER, a citizen of the United States of America, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Reversible Feed Mechanism for Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to means which render a sewing-machine capable of sewing in opposite directions at will without changing the direction of the rotation of any of its shafts; and it consists in certain features hereinafter described, and specifically set forth in the claims.

Figure 1 is a side elevation, partly in section, of a sewing-machine provided with my invention. Fig. 2 is a front elevation with parts removed. Fig. 3 is an enlarged view of details. Fig. 4 is a side elevation of a modified arrangement. Fig. 5 is a sectional view, showing parts on the left of line $x\,x$, Fig. 4; and Fig. 6 is a modification.

Like letters refer to like parts in all the figures.

The object of my invention is to provide means which will render sewing-machines of those classes known as "presser-foot-feed," "needle-feed," and "four-motion-feed" machines capable of feeding the material in opposite directions at will while sewing, for the purpose of producing variations in the directions of the seams, and to obviate the necessity of tying or otherwise securing the end or ends of the thread or threads at the end of a seam, the character of the stitch being not affected or essential.

The principal devices employed in attaining the object in view are a double cam mounted upon any convenient shaft, and a pivoted lever carrying or connected to the feed-dog, the cam being adapted to receive motion from said shaft, and at the same time capable of longitudinal movement thereon, so as to operate the lever, as hereinafter described.

A represents a double cam comprising two single cams, $a\ a'$, each projecting in diametrically-opposite directions, and a collar, a^2, circumferentially grooved, as at a^3, and provided with a pin, a^4, which rides in a groove, c, formed and disposed longitudinally in the shaft C, which may be the main shaft in a top or needle or presser-foot feed machine, as illustrated in Fig. 1; or said shaft may be located beneath the base-plate in under-feed or four-motioned-feed machines, and said shaft, when so located, may or may not, as desired, also operate the shuttle-carrying mechanism in double-thread machines or the looper in single-thread machines. In top-feed machines I employ the means shown in Fig. 1, located in the top, or it may be in the side or bottom, of the arm, and in under-feed machines shown in Fig. 4, located above and upon the base-plate and operated from above the same; or it may be from or at the under side, for changing the position of the double cam, so that either of its single cams shall operate the lever. The top, side, or bottom of the arm is slotted, as at d, for the passage therethrough of a thumb-screw, d', by which a bar, d^2, bent at the end to project into the groove a^3 of the collar a^2, is held firmly against the inner surface of the arm of the machine, or, as shown in Fig. 4, against the under side of the base-plate.

By the description thus far given it will be seen that the double cam A and its collar may be moved longitudinally upon the shaft and be rotated by it.

B represents a lever pivotally secured to any convenient fixed portion of the machine, one end of the lever being bifurcated and adapted by relative location to encompass the shaft, and bear upon or against the cam A, or partially encircle the same, the bifurcations or arms b being more than the diameter of the single cam distant from each other. The lever is pivotally secured to the machine by an adjustable pivot, E. This latter device comprises the following elements: a bolt, the head e of which fits a seat in a washer, e', located on one side of the lever B, the body e^2 of which fits or passes through said washer, the slot in the lever, and a second washer, e^3, on the opposite side of the lever, and the reduced extension of

which fits a third washer, e^4, and passes through a slot in the back side of the head D of the machine, and is screw-threaded and provided with a thumb-screw, e^5, which operates against the head of the machine to firmly bind the parts together, except the lever and washers e' and e^3, which, by reason of the shoulder at the junction of the reduced extension, and full-sized body of the bolt which abuts against the washer e^4, are drawn together with sufficient firmness only to prevent longitudinal movement of the lever, and yet permit a pivotal movement thereof by reason of the lesser frictional contact-surface in those parts operating against each other in the pivotal movement than in those which serve to retain it from longitudinal movement. If desired, the face and back of the lever and the surfaces of the washers coming in contact therewith may be corrugated to prevent longitudinal movement of the lever. To adapt the adjustable pivot to an under feed, a bracket, D′, is cast on the under side of the base-plate, and provided with a slot through which the screw-threaded extension passes into a nut, as shown, the thumb-screw e^5 being on the larger or body portion of the bolt.

To the end of the lever is connected the usual feed-dog, F, and this may be of such a character as is required, according to the class of the machine to which the described mechanism is applied.

In a top-feed machine, as illustrated and thus far described, the operation is as follows, (see Figs. 1, 2, and 3:) The main shaft C being provided with the crank c', connected to the needle-bar c^2 by a link, c^3, and rotated in the direction indicated by the arrow, will rotate the cams and collar in the same direction, and these, being moved upon the shaft so that the cam a revolves within the arms b of the lever, as shown in Fig. 2, will, while the needle is up, throw the upper end of said lever to the left and its lower end to the right, thus feeding the material to the right, and as the needle is coming down and until it at least enters the material the cam a does not operate on the opposite arm, b, by reason of its being a greater distance from the other arm than the diameter of the cam, the excess of distance determining how far the needle shall move before the cam shall act against said opposite arm. In this manner a period of rest is obtained before the return movement of the feed-dog, and said movement is caused to occur after the needle has entered into the material sufficiently to prevent backward feeding during said return movement.

It is apparent that the outline of the cam may be such that the arms b may constantly embrace the same and yet a period of rest be obtained.

If it is desired to feed to the left, it is only required that the cam a' be moved within the arms b, as shown in Fig. 1, and this is accomplished by loosening the screw d' and moving the same and the plate d^2 toward the head of the machine, and this may be done while the machine is in operation or at rest, and either manually or by suitable automatic devices.

To vary the stitch—that is, as to its length—the pivot E may be raised to increase and lowered to diminish the same in a manner apparent from the description already given.

In a four-motion feed the lever B passes through or is in any suitable manner connected to the feed-dog F, (see Figs. 4 and 5,) and is pivoted to a bracket, D′, formed on the under side of the base, in which case the elements of the adjustable pivot are operated in a similar manner to that heretofore described. The lateral reciprocation of the feed-dog is produced by the lever B in the same manner as in the top feed, and its vertical reciprocation is produced by a properly-timed cam, D^3, secured to the end of the shaft C, striking a pin or projection, f, upon the dog; or it may be arranged directly beneath the dog, so that during each revolution of the shaft and cams, and while the needle is up, the dog is raised, as shown, and caused to feed. In this instance the dog is held in position against a bracket, D^2, by means of a screw, D^4, passing through a slot in the dog and into the bracket D^2, as clearly shown. A spring, D^5, may be used to depress the dog; or cam D^3 may positively lower the same.

It is apparent that in needle-feed machines the lever B would be connected to the needle-bar directly, but in such a manner as to permit of its longitudinal movement, which manner, in the present state of the art, in connection with the description already given, will be readily understood.

The modification illustrated by Fig. 6 shows that the lever B need not be bifurcated; but its single upper arm, b, may be pressed or drawn against the cam A by a spring, B^3, and when it is desired to shift the cam to bring either of its single cams a or a' into operation the lever is thrown off by means of the push-button B′, which is pressed against the lever until the cam is shifted, when the spring B^2 withdraws the button from the lever. The button may be located on the arm of the machine, if desired.

It is apparent that the lever B may be thrown off by simply pressing or drawing the presser-foot in the proper direction to move the upper end of lever B away from the cam.

Having described my invention and its operation, what I claim as new, and desire to secure by Letters Patent, is—

1. In a sewing-machine, the combination, with the upper rotating shaft thereof, of a double cam adapted to move longitudinally thereon and rotate therewith, and a lever pivoted to a fixed part of the arm of the machine and connected to the feed mechanism, substantially as and for the purpose set forth.

2. In a sewing-machine, the combination, with a rotating shaft thereof, of a double cam adapted to move longitudinally thereon and rotate therewith, and a bifurcated lever pivoted to a fixed

part of the machine and connected to the feed mechanism, substantially as and for the purpose set forth.

3. The combination of a shaft, a double cam adapted to be moved longitudinally thereon, and a bifurcated lever adjustably pivoted to a fixed part and connected to the feed-dog, substantially as shown and described.

4. The combination of a slotted lever, a washer upon each side thereof, a slotted frame-work, a nut and washer on opposite sides thereof, and a screw-threaded bolt having a shoulder and head, whereby said lever is pivotally and adjustably secured to said frame-work at desired points, substantially as shown and described.

5. The combination of the lever B, double cam A, having grooved collar a^2, the pin a^4, slotted shaft C, the frame-work, slotted as at d, the bent plate d^2 and thumb-nut d', pivot E, and feed-dog F, substantially as shown and described.

6. The combination of the slotted lever B, slotted frame-work D, the washers e' e^3 e^4, and the bolt e e^2, having a screw-threaded extension, and the nut e^5, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES ZELNER.

Witnesses:
EDWARD GILON,
J. JAMISON RAPHAEL.