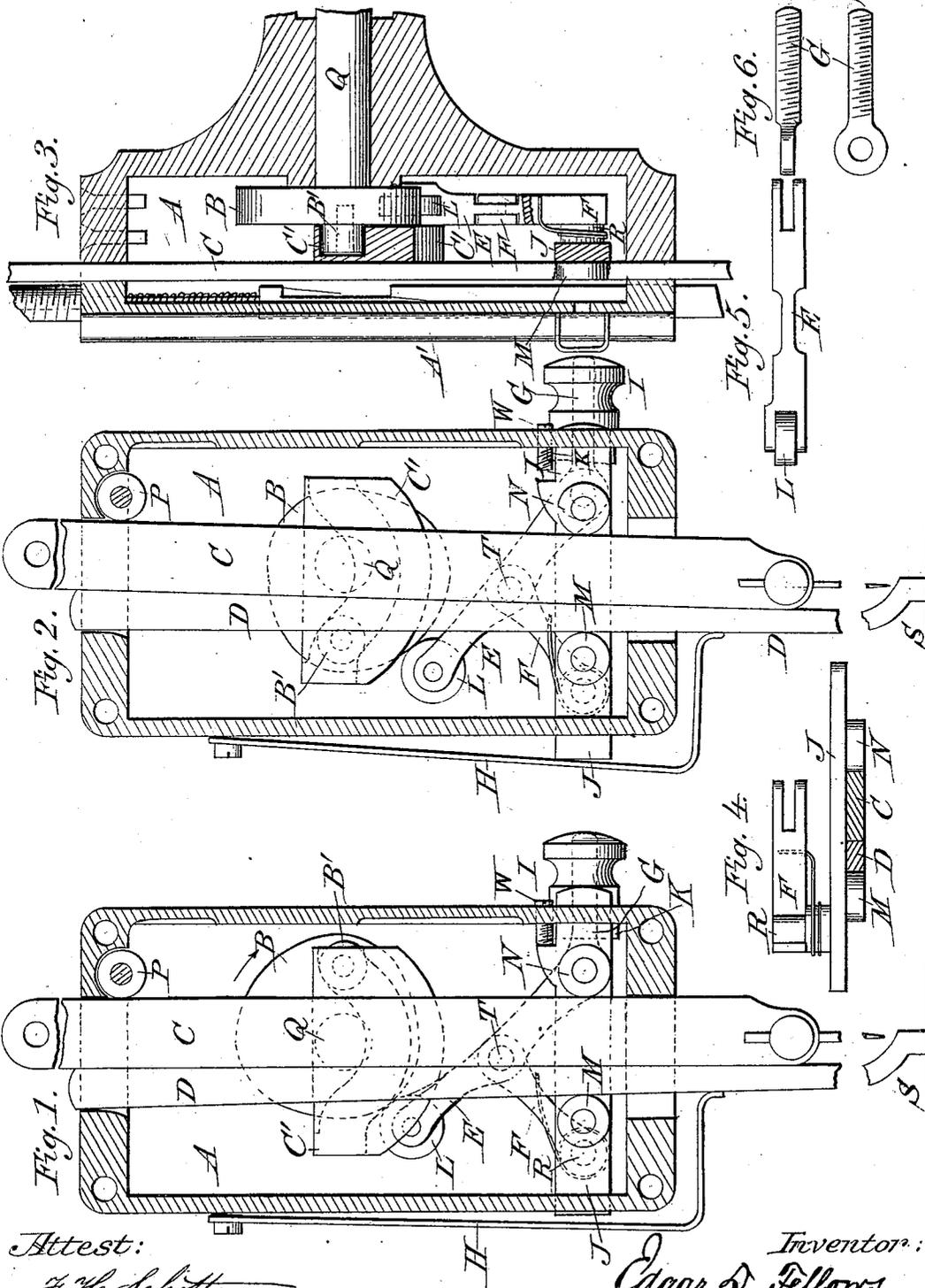


(No Model.)

E. D. FELLOWS.
VERTICAL FEED SEWING MACHINE.

No. 282,873.

Patented Aug. 7, 1883.



Attest:
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UNITED STATES PATENT OFFICE.

EDGAR D. FELLOWS, OF WATERTOWN, NEW YORK, ASSIGNOR TO THE
DAVIS SEWING MACHINE COMPANY, OF SAME PLACE.

VERTICAL-FEED SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 282,873, dated August 7, 1883.

Application filed February 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDGAR D. FELLOWS, of Watertown, Jefferson county, New York, have invented a new and useful Improvement in Vertical-Feed Sewing-Machines, which improvement is fully set forth in the following specification.

This invention relates to sewing-machines in which the work is advanced by means of one or more vertical feeding devices supported in the head of the machine and movable both vertically and horizontally, and has special reference to the means for imparting the horizontal or lateral movement to the feeding devices.

Ordinarily, as in the well-known Davis sewing-machine, the needle-bar constitutes one of the vertical feeding devices, and, in connection with it, an auxiliary vertical feed-bar or helper-bar is employed. The invention is shown herein as applied to a machine of this construction, although it is applicable generally to machines of the class indicated.

It consists, mainly, in the combination, with the feeding devices, of a lever and link, constituting a toggle, but comprises, also, other special combinations of parts, as hereinafter specified.

In the accompanying drawings, which form a part of this specification, Figures 1 and 2 are views in sectional elevation of the head of a sewing-machine constructed in accordance with the invention, said figures showing the feed mechanism in different positions; Fig. 3, a similar view in a plane at right angles to that of Figs. 1 and 2; and Figs. 4, 5, and 6, detail views.

The same letters in each figure refer to the same parts.

A represents the cam house or head of the machine; A', the face-plate; B, the feed-cam or shaft-head; B', the needle-cam roll or driver; C, the needle-bar; C', the needle-cam; D, the helper-bar; E and F, the lever and link, combined so as to form a toggle; G, the regulating-screw; H, the feed-spring; I, the regulating-nut; J, the sliding cross-bar; K, the check-nut; L, M, N, and P, the rolls; Q, the shaft; R, the stud; S, the line of work-plate; W, a screw-stop, and T the joint of the toggle.

The needle-bar C and helper-bar D pass

through slots in the roof and floor of the cam-house A, or, more strictly, through slots formed in the flanges of the face-plate, and between the said flanges and the corresponding walls of the cam-house. The slot at the top has the roll P at one end, and the said roll, with the side walls and opposite end wall of the slot, forms fixed guides, which allow the said bars to swing horizontally or laterally in the plane of the feed movement, (at right angles to the length of shaft Q,) as well as to reciprocate vertically. The slot at the bottom of the cam-house is longer than the combined width of the two bars, so as to permit the swinging motion above mentioned, but its width is equal to their common thickness, so as to keep them in the same planes of motion.

The needle-cam C' is the ordinary grooved heart-cam, and is fixed to the needle-bar. It is engaged by the roll or driver B', which is fastened on the face of the revolving cam B, and which works in the groove in the needle-cam, so as to reciprocate the needle-bar vertically. The needle-bar is so connected with the helper-bar and presser-bar that at each descent of the needle-bar the helper-bar is depressed and the presser-bar lifted, and at each ascent the reverse operations take place. The device used for this purpose is or may be the usual bent lever long used in the Davis sewing-machine, which, as it is well known and forms no part of this invention, needs no illustration or particular description. The needle-bar is likewise connected with and operates the take-up in the usual way.

The sliding cross-bar J carries the rolls M N, which embrace between them the vertical bars C D, so that the three bars move together horizontally back and forth. The screw N, which is tapped into the front wall of the cam-house, forms a stop to the sliding cross-bar J, and limits its forward movement by contact with a lug on said cross-bar. The adjustment of said screw regulates the position of the vertical feeding devices during the descent of the needle.

The lever E is pivoted at its lower or front end to the end of the regulating-screw G, which is tapped into the regulating-nut I, itself journaled in the front (right hand, Figs. 1 and 2) wall of the cam-house A, so that by turning

said regulating-nut in one direction or the other the pivot or fulcrum of lever E will be moved toward or away from the said wall. The upper or rear end of the lever E carries the roll L, with which the feed-cam B makes contact at each revolution of the shaft Q, which is journaled in bearings in the stationary arm or goose-neck of the machine, and extends into the cam-house at the end of said arm or goose-neck. The link F, at the lower or rear end, is attached to and turns upon the stud R, fixed to cross-bar J, and at its upper or front end it is journaled to the lever E at T. The feed-spring H is fixed to the rear (left hand, Figs. 1 and 2) of the cam-house, and presses constantly against helper-bar D.

The parts being in the position shown in Fig. 1, with the roll L in contact with the smallest diameter of the cam B, the latter being rotated in the direction of the arrow, the large diameter of the cam will be brought into contact with the roll L and depress the lever E and link F, bringing the toggle into the position shown in Fig. 2. The lever E, being pivoted firmly to the regulating-screw G, and said screw being held in position by the thumb-nut I, which is fastened into the side of the cam-house by the check-nut K, prevents the lower end of lever E receding when the toggle is depressed; but link F, being pivoted by stud R to the sliding cross-bar J, is free to move in either direction, and when the toggle is depressed link F carries the sliding cross-bar in the direction of the feed movement into the position shown in Fig. 2, and the needle and helper bars C and D, being held between the rolls M and N, attached to the outer side of the sliding cross-bar, are given a lateral motion, and the goods to be sewed, being placed on the cloth-plate S under the feed-bar D, are carried backward to form another stitch. Spring H returns the bars to a vertical position when roll L reaches the lower side of the cam B. The feed-cam B, the needle-cam C', and the needle-cam roll or driver B' are so arranged that the cross-bar J and the vertical bars CD are moved in the direction of the feed (to the left, Figs. 1 and 2) after the needle-bar and helper-bar have descended, and that the reverse or return movement under the pressure of spring H is allowed to take place after the foot of the helper-bar and the needle have been raised clear of the work.

The length of movement of the cross-bar J, which determines the length of stitch, is regulated by turning the nut I, and thus shifting the screw G and pivot or fulcrum of lever E. By moving said fulcrum toward the rear of the machine (to the left, Figs. 1 and 2) the roll L will be brought closer to the shaft Q, and will consequently be moved a greater distance by the feed-cam B. The greater the motion of roll L the greater, of course, will be the motion of the link F and cross-bar J. By moving the fulcrum toward the front (right, Figs. 1 and 2) the roll L will be moved away from the shaft Q and the feed motion short-

ened. The return of the cross-bar J can be facilitated by a suitably-placed spring, and an adjustable stop can be used to limit its forward motion; but these devices, while of assistance, are not essential to the operation of the machine, as the spring H will return the cross-bar as well as the vertical bars, and the front end of the slot at the bottom of the cam-house will act as a stop to limit the forward motion of all the bars.

As shown, the shaft Q runs toward the operator, who sits at the front of the machine. The effect of this is, that the needle-cam roll or driver, by its action on the needle-cam, aids in returning the needle-bar to a vertical position, and in holding it in that position during its descent, instead of tending to displace it, as it would do if the shaft were run in the opposite direction. For a full explanation of the operation, reference may be had to the patent of Wm. S. Carlisle for improvement in vertical or top feed sewing-machines, dated January 9, 1883, and numbered 270,540. The new feed mechanism herein described could, however, the position of the feed-cam on the shaft being properly changed, be used in a machine having the shaft run in the opposite direction, the dog for returning the cross-slide shown in Patent No. 250,053, to Thos. Carey, November 29, 1881, being used, or the needle-bar being pivoted on the face of an auxiliary cam-bar, as described in patent to Job A. Davis, No. 58,614, dated October 9, 1866, or the disturbing effect of the roll or driver on the needle-cam being neutralized or avoided by other suitable means.

The parts of the machine not shown may be of the ordinary or of other suitable construction.

Modifications may be made in the details of construction without departing from the spirit of the invention, and parts of the invention could be separately used, if desired.

The term "vertical feeding devices" is used herein to include one or more such devices.

Having now fully described my said invention and the manner of carrying the same into effect, what I claim is—

1. The combination, with vertical feeding devices and a feed-cam, of the toggle and connected parts for imparting lateral motion from said cam to said feeding devices, said feed-cam, toggle, and connected parts being arranged in the cam house or head of the machine, substantially as described.

2. The combination, with vertical feeding devices, of the feed-cam, the lever, the link jointed to said lever and arranged to form therewith a toggle, and means for conveying motion from said link to said vertical feeding devices, said parts for operating the vertical feeding devices being arranged in the cam house or head of the sewing-machine, substantially as described.

3. The combination, in a feed mechanism, of a lever, an adjustable fulcrum-piece—such as the regulating-screw shown—a feed-cam for acting upon the free end of the lever, and a

link connected with said lever at an intermediate point for conveying the motion thereof, substantially as described.

4. The combination of the vertical feeding devices, the sliding cross-bar, the lever, the adjustable fulcrum-piece therefor, the link, and the feed-cam, substantially as described.

5. The combination, with feeding devices, of a lever, an adjustable fulcrum-piece therefor, a feed-cam, a link, and a connection between

said link and said feeding devices, said lever carrying a friction-roll which bears against said feed-cam, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EDGAR D. FELLOWS.

Witnesses:

LEVI A. JOHNSON,
JAMES C. BURT.