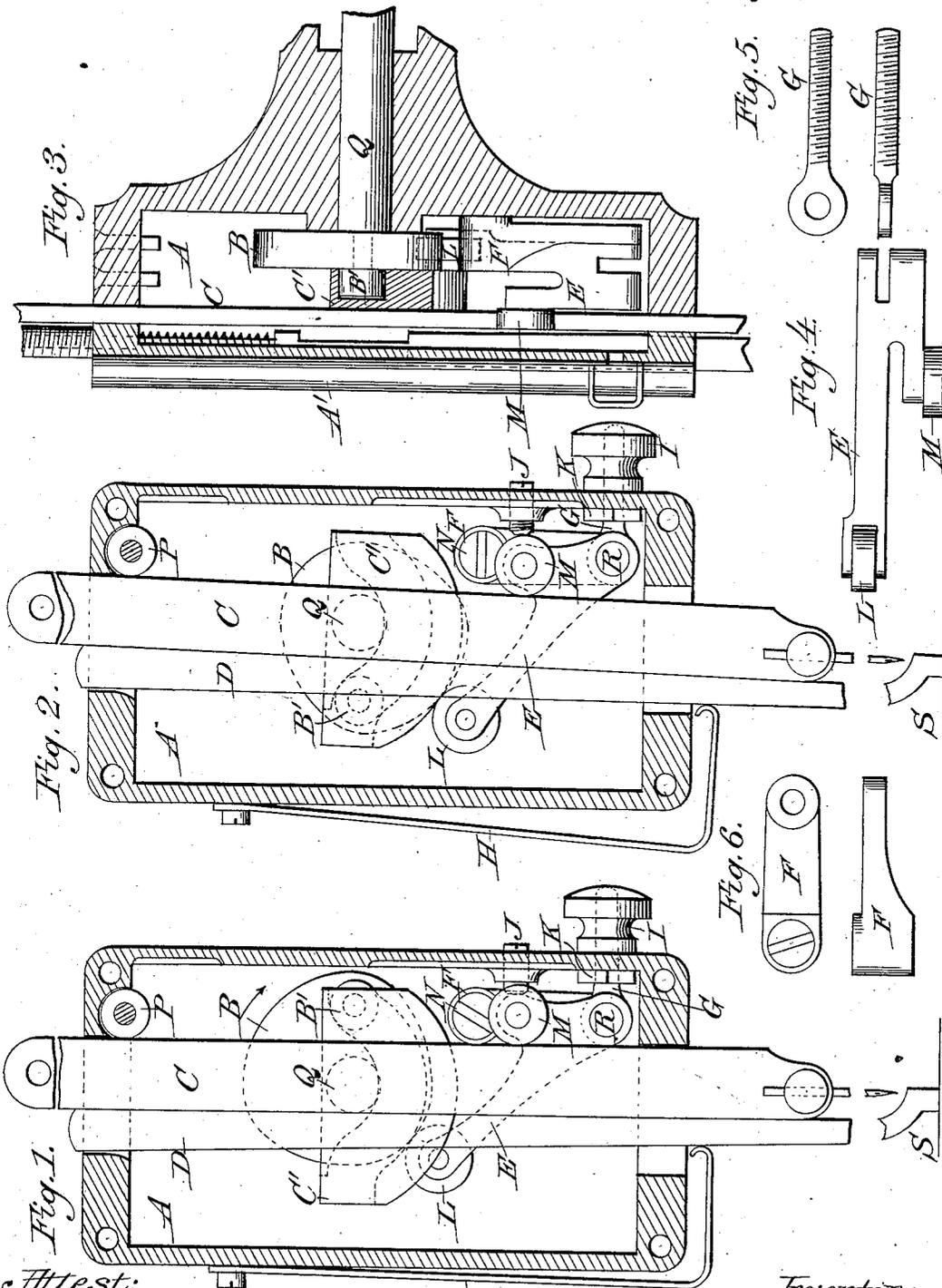


(No Model.)

E. D. FELLOWS.
VERTICAL FEED SEWING MACHINE.

No. 280,731.

Patented July 3, 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. 280,731, dated July 3, 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 the 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 and lateral movements 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 in a feed-lever, and specially in an angular or bent lever so combined with a feed-cam and the vertical feeding devices that one arm is acted upon directly by the said cam, and the other arm acts upon the feeding devices to impart lateral motion thereto.

It further comprises the means for supporting the feed-lever and for regulating its throw.

In the accompanying drawings, 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 like parts.

A represents the cam-house; A', the face-plate; B, the shaft-head or feed-cam; C, the needle-bar; C', the needle-cam; D, the helper-bar; E, the feed-lever; F, the hanger; G, the regulating-screw; H, the feed-spring; I, the thumb-nut; J, the stop-screw; K, the check-nut; L, M, and P, rolls; N, the hanger-screw;

Q, the shaft; R, the pivot of feed-lever, and S the surface of the cloth-plate.

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, form 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 plane 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 feed-lever E, shown as an angular or bent lever of unequal arms, turns upon the pivot R, which passes through the body of the lever, and also through the eye in the end of the regulating-screw G. The longer arm extends obliquely upward, and carries at its outer end the roll L, within striking distance of cam B. The shorter arm is vertical, or nearly so, and carries the roller M, which is journaled on a projecting stud, (see Fig. 4,) and bears against the front edge of the needle-bar. The stop J

limits the motion of the lever toward the front of the machine. It is so adjusted that when the lever E bears against it the needle-bar, resting against the roll M, will be vertical.

5 The fulcrum-piece or regulating-screw G is engaged by the nut I, which is journaled in the front wall of the cam-house. The said piece or screw, being held from turning by its connection with lever E, will be moved toward or away from the adjacent wall of the cam-house by turning the thumb-nut I in the one direction or the other.

10 In order to relieve the fulcrum-piece or adjusting-screw of the weight of lever E and the strain thrown upon the pivot R, the said pivot R is extended into the hanger F, which is supported from the fixed screw N, which is tapped into the adjacent side wall of the cam-house.

15 The spring H is fixed to the rear wall of the cam-house, on the outside, and bears always against the helper-bar D, tending to move it toward the front of the machine, (to the right, Figs. 1 and 2,) or in the direction opposite to the feed movement.

20 Fig. 1 shows the feed-lever E with the roll L in contact with the smallest diameter of the cam B, the needle and helper bars being held in a vertical position, with the needle-bar resting against the roll M.

25 In Fig. 2 the shaft-head B, having been rotated in the direction of the arrow, has brought the large diameter in contact with roll L and caused the feed-lever E to swing down on the pivot R and force roll M, with the needle and helper bars, backward, or in the direction of the feed movement. As the large diameter of the cam recedes from the roll L the spring H forces back the helper-bar D, the needle-bar C, and the lever E until the motion is arrested by stop J.

30 The feed-cam B, the needle-cam C', and the needle-cam roll or driver B' are so arranged that the roll M and the vertical bars C D 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 the spring H is allowed to take place after the foot of the helper-bar and the needle have been raised clear of the work.

35 The length of movement of the roll M, 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 the movement of roll M. By moving the pivot R or fulcrum of lever E toward the front, the roll L will be moved away from the shaft Q and the feed movement correspondingly shortened. The length of stitch being thus regulated, by giving the roll L more or less contact with the cam

B, it is possible to draw the pivot R back far enough by means of the thumb-nut I and screw G, so that roll L will leave the cam B entirely, the feed being thereby stopped and no lateral movement given to the bars at all.

70 By this invention great simplicity combined with great durability is attained, there being but one working joint, and the movement on that being scarcely perceptible.

75 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.

80 For a full explanation of the operation reference may be had to the patent of Wm. S. Carlisle, for "improvements 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 needle-bar being pivoted on the face of an auxiliary cam-bar, as described in patent to Job A. Davis, October 9, 1866, No. 58,614, or the disturbing effect of the roll or driver being neutralized or avoided by other suitable means.

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

90 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.

95 The term "vertical feeding devices," as employed herein, includes one or more such devices.

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

1. The combination, with the needle-bar and helper-bar, both of them movable vertically and laterally, of a feed-cam and a feed-lever supported in the cam house or head, between said devices and the inner wall of said cam house or head, and having one arm acted upon directly by said feed-cam, and the other acting directly upon the needle and helper bars, and adjusting means for regulating the stroke of said bars, said feed-cam and feed-lever being arranged to advance the said bars while the needle is below the cloth-plate, substantially as described.

2. The combination, with the vertical feeding devices, of the angular feed-lever and its adjustable fulcrum-piece, substantially as described.

3. The combination, with a feed-lever and its adjustable fulcrum-piece, of the hanger for relieving the latter from strain, substantially as described.

4. The combination, with vertical feeding devices and the feed-cam, of the angular feed-lever fulcrumed at the bottom of the cam-house, and provided with two upright arms of unequal length, the longer arm being acted upon directly by said feed-cam, and the shorter one acting directly upon the feeding devices, so that the said lever reduces the motion of the feed-cam in conveying the same to said feeding devices, the arrangement of the fulcrum at the bottom of the cam-house allowing the proper relative length of the lever-arms to be obtained most advantageously, substantially as described.

5. The combination of the vertical feeding devices, the feed-cam, the feed-lever, the adjustable fulcrum-piece, the hanger, and the

means for returning said feeding devices and lever, substantially as described.

6. The combination of the vertical feeding devices, the feed-cam, the feed-lever carrying two friction-rolls, one bearing against the feed-cam and the other against said feeding device, the adjustable fulcrum-piece for said lever, and the adjustable back-stop, 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.