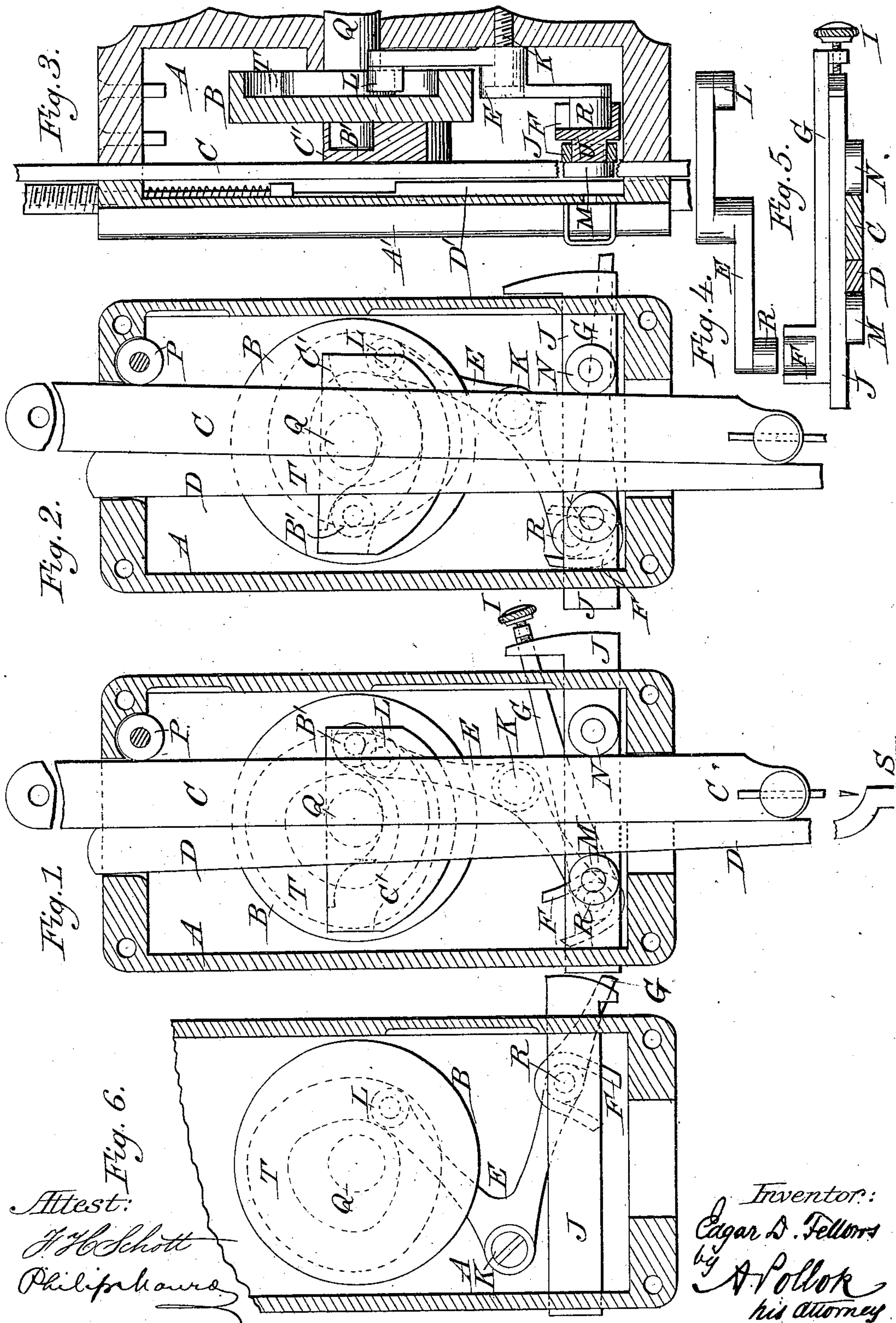


(No Model.)

E. D. FELLOWS.
VERTICAL FEED SEWING MACHINE.

No. 282,874.

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. 282,874, 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 vertical feeding devices, of mechanism for controlling positively the position of the said devices at all points in their lateral or horizontal motion.

Heretofore the return motion of the feeding devices has been effected by means of a spring or springs. In the machine described in the Patent No. 250,053, to Thos. Carey, November 29, 1881, a return feed-dog is employed; but in the normal operation the springs return the feeding devices, and the feed-dog simply prevents the needle-cam roll or driver, by its action upon the heart-shaped needle-cam, from displacing the needle-bar when the latter, with the helper-bar, has been brought to a vertical position. Moreover, if the springs be omitted, the feeding devices will be left free from both dogs a part of the time, so that they are not at all points positively controlled.

The invention further comprises certain special combinations of parts, as hereinafter indicated.

The accompanying drawings illustrate the head of a Davis sewing-machine constructed in accordance with the present invention, Figures 1 and 2 being views in vertical section at right

angles to the goose-neck or stationary arm of the machine, and in elevation looking to the right, the two views showing the feed mechanism in different positions; Fig. 3, a view in vertical section parallel to the goose-neck and in elevation looking to the rear; Figs. 4 and 5, detail views; and Fig. 6, a view similar to Fig. 1, showing a modified construction.

A represents the cam house or head of the machine; A', the face-plate; B, the shaft head or disk of the feed-cam; B', the needle-cam roll or driver; C, the needle-bar; C', the needle-cam; D, the helper-bar; D', the presser-bar; E, the feed-lever or bell-crank; F, the regulating-yoke; G, the regulating-lever; I, the set-screw; J, the sliding cross-bar; K, the fixed stud; L, M, N, P, and R, rolls; Q, the shaft; S, the line of cloth-plate; T, a cam-groove, and U a stud.

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 and 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.

5 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.

10 The regulating-lever G is carried by the cross-bar J, the stud U, which is fixed to the side of the lever G near one end, and serves as the pivot for said lever, being journaled in said cross-bar. The opposite end of the regulating-lever has a lateral projection which extends
15 over the enlarged end of the cross-bar J, and is provided with the set-screw I, which is tapped into said projection and adapted, when set down, to hold the regulating-lever in whatever position it is adjusted to. The front end
20 of cross-bar J is arc-shaped, with the axis of stud U as a center, to facilitate the adjustment of the regulating-lever. The regulating-yoke F is attached to and movable with the lever G. The lever G, yoke F, and stud U are or
25 may be cast in one piece.

The feed-lever E turns upon the stud K, fixed to the side (right hand, Fig. 3) wall of the cam-house. The upper arm, which carries the roll L, is engaged by the feed-cam T B, the
30 said roll L fitting and working in said cam-groove T. For convenience the groove is made in the inner (right hand, Fig. 3) face of the shaft-head or cam-disk B. The lower arm of the feed-lever, which carries the roll R, engages the regulating-yoke F. By the rotation
35 of the shaft Q and feed-cam T B the lever E is vibrated, and the roll R, acting upon the yoke F, reciprocates the sliding cross-bar J, which, of course, carries with it the needle-bar C and helper-bar D. The stroke of the
40 cross-bar depends upon the inclination of the yoke F, which can be varied by adjusting the free end of lever G up or down, thereby diminishing or increasing the stroke.

45 Fig. 1 shows the position of the feeding devices with the roll L in the cam-groove T at a point nearest the shaft, and the regulating-lever G at its highest point, holding the U-shaped yoke F in an inclined position, so that upon rotating the shaft-head B the cam-groove
50 T, acting upon roll L, will cause the feed-lever E to vibrate, carrying roll L up and down the yoke F without any effect upon cross-bar J, to which the yoke F and its lever G are pivoted.

55 Fig. 2 shows the position of the feeding devices with the roll L in the cam-groove T at a point farthest from the center of the shaft O, and the regulating-lever G at its lowest point, with the U-shaped yoke in a vertical
60 position.

It will be observed that the feed-lever E being firmly pivoted to the cam-house A, as shown at K, and the yoke F being pivoted to the sliding cross-bar J, the position of bell-crank and yoke, as shown in Fig. 2, has drawn
65 the sliding cross-bar J forward, carrying the feed and needle bars with it, they being held

between the rolls M and N, as shown in detail in Fig. 5. By rotating the shaft-head B so as to bring the feed-lever E back to its position, as shown in Fig. 1, the roll R, working
70 in the yoke F, brings the sliding cross-bar back to the position shown in Fig. 1. The position of yoke F in Fig. 2 gives movement enough to sliding cross-bar J to produce a very long
75 stitch; but by raising lever G and clamping it in any intermediate position by means of the screw I the length of stitch can be regulated as desired.

It will be observed that by the use of the improved mechanism the lateral movement of the needle and helper bars is made positive both ways, and that said bars are always under the control of the feed-cam, it not being
80 necessary to depend on a spring for returning the bars to a vertical position, or for other purpose, although one or more springs can be used, if desired.

The feed-cam B, the needle-cam C', and the needle-cam roll or driver B' are so arranged
90 that the cross-bar J 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 takes place after
95 the foot of the helper-bar and the needle have been raised clear of the work.

In Fig. 6 the construction and operation are substantially the same as described with reference to Figs. 1 to 5, but changes have been
100 made in details. Thus the yoke F is inverted and the regulating-lever is pivoted near the front, instead of the rear, of the cross-bar, the regulating-lever is shortened, the pivot of the feed-lever is placed toward the rear, (left hand, Figs. 1, 2, and 6,) and the shape of the feed-lever is somewhat altered.

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
110 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
115 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,
120 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 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
130 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 the needle-bar and helper-bar, both of them movable vertically and laterally, of a feed-cam placed in the cam house or head of the machine, and reciprocating parts operated by said cam for imparting lateral movement to said bars, said reciprocating parts having constantly a positive connection with said cam and feeding devices and with each other, so that the movement of said feeding devices independently of the feed-cam is at all times prevented, substantially as described.

2. The combination, with the needle-bar and helper-bar, both of them movable vertically and laterally, of a grooved feed-cam, a feed-lever operated thereby, devices for communicating from said lever to said bars a back-and-forth movement positive in both directions, and means for regulating the extent of said movement, substantially as described.

3. In a feed mechanism for sewing-machines, the adjustable yoke, in combination with the feeding devices and auxiliary operating means, said yoke being movable with said feeding devices, substantially as described.

4. The combination, with vertical feeding devices, of the sliding cross-bar, the grooved cam, a device engaged by the groove of said cam, so as to be reciprocated thereby, and connections for imparting from said reciprocatory device the return as well as the advance movement to said cross-bar, and through it to the vertical feeding devices, substantially as described.

5. The combination of the sliding cross-bar, the adjustable yoke, and the feed-lever with means for vibrating said lever, substantially as described.

6. The combination of the grooved cam, the lever, the sliding bar, and the adjustable yoke, substantially as described.

7. The combination of the vertical feeding devices, the grooved feed-cam, the feed-lever, the sliding cross-bar, the adjustable yoke, and the rolls on said cross-bar and lever, 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.