

(No Model.)

C. H. WILLCOX & S. BORTON.
FEED MECHANISM FOR SEWING MACHINES.

No. 572,041.

Patented Nov. 24, 1896.

Fig. 1.

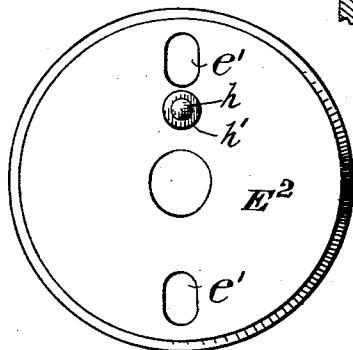
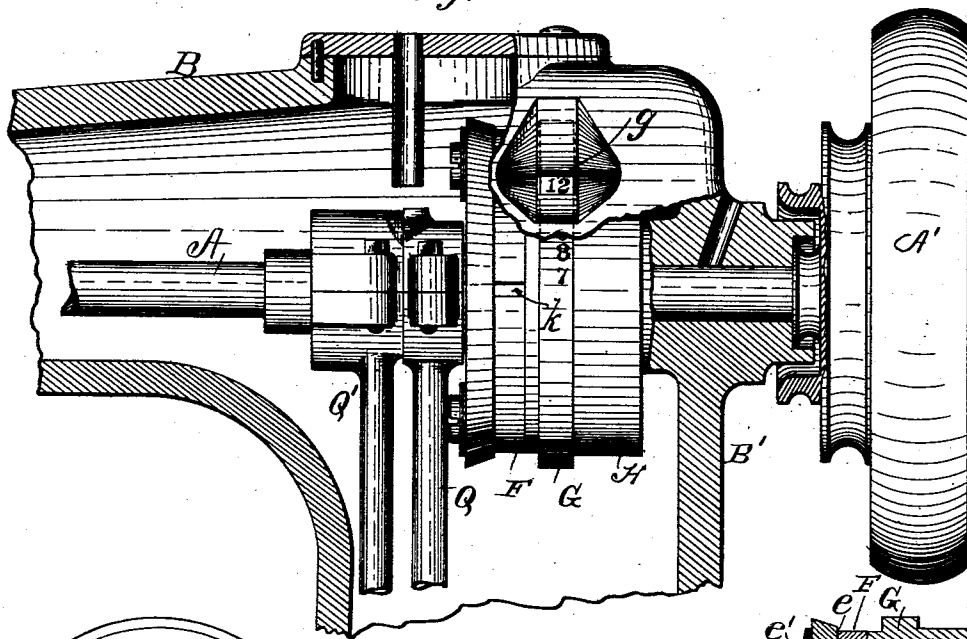


Fig. 3.

Fig. 4.

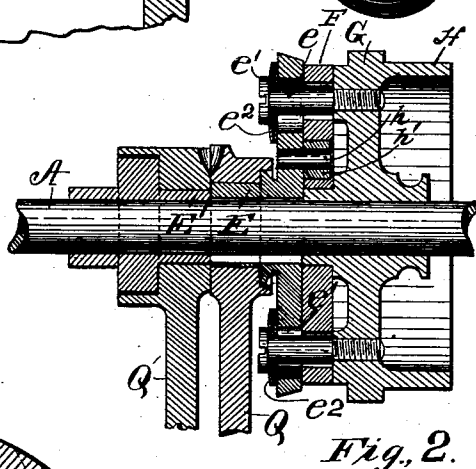
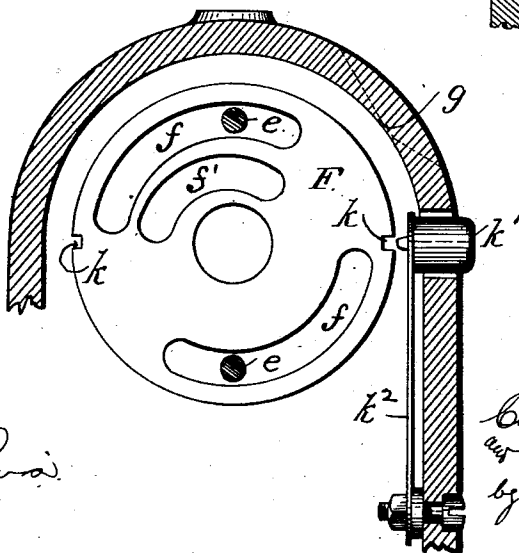


Fig. 2.

Witnesses.

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UNITED STATES PATENT OFFICE.

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FEED MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 572,041, dated November 24, 1896.

Application filed August 10, 1895. Serial No. 558,850. (No model.)

To all whom it may concern:

Be it known that we, CHARLES H. WILLCOX, of New York, and STOCKTON BORTON, of Brooklyn, New York, have invented new and
5 useful Improvements in Feed Mechanism for Sewing-Machines, which improvements are fully set forth in the following specification.

This invention has reference to the feed-movement of a sewing-machine, and particu-
10 larly to a feed mechanism wherein the back-and-forth movement of the feed-bar is derived from a feed-eccentric on the main shaft, or it may be any continuously-rotating shaft of the machine. The object of the invention is
15 to provide means for varying or regulating the length of stitch.

According to the present invention the length of the horizontal movements of the feed-bar is regulated by adjusting the po-
20 sition of the feed-eccentric relatively to the axis of its shaft, and the invention embraces special means whereby this adjustment is effected. These special adjusting devices are not necessarily limited to use in connection
25 with a feed-eccentric, but may obviously be employed in connection with any eccentric or crank whose throw it is desired to vary. The eccentric is carried by a suitable support, preferably a disk, which is connected by
30 screws with a disk or pulley fast on the shaft, so that the eccentric turns with the latter. These screws, however, pass through radial slots in the eccentric-support, so that the latter can be adjusted radially of the shaft, the
35 eccentric being held from slipping by the pressure of suitable friction-washers surrounding the shanks of the connecting-screws or by other equivalent means. The adjust-
40 ment is effected by a cam-disk interposed between the fast disk and the eccentric-support and mounted loosely on the hub of the former. The cam-disk is provided with concentric slots, through which the connecting-screws
45 pass freely, and with a cam-groove, into which enters a crank-pin on the eccentric-support. By turning the cam relatively to the main shaft and the eccentric the action of the cam surface or slot on the crank-pin moves the ec-
50 centric transversely to the axis of the shaft, varying the throw of the eccentric. Instead

of turning the cam the same effect is obtained by turning the main shaft and holding the cam stationary, and this is the preferred mode of operation. For this purpose the cam has a peripheral notch, and a movable push-pin is
55 provided having a tooth to enter said notch, so that by depressing the pin and engaging its tooth in the notch the cam is held stationary, overcoming the friction of the washers, while the main shaft is turned the desired distance
60 to vary the throw of the eccentric. In order that the adjustment may be effected with accuracy, a series of graduated marks are arranged on the periphery of a disk carried by the shaft, (which may conveniently be the
65 fast disk already referred to,) which marks show through an opening in the frame of the machine. The graduated marks are preferably figures indicating each a certain number
70 of stitches to the inch, and the notch in the cam-plate is so arranged relatively to the markings on the disk that when the former is arrested by its stop the figures exposed through the opening will indicate the length
75 of stitch to which the machine is at that time adjusted. Then to vary the adjustment the operator has only to turn the shaft forward or backward until the number corresponding to the desired length of stitch appears through
80 the opening.

In the accompanying drawings, which form part of this specification, Figure 1 is an elevation of part of a feed-actuating mechanism containing the present invention, the casing or frame of the machine being partly broken
85 away. Fig. 2 is a vertical section on the axis of the shaft through the variable eccentric and its adjusting mechanism. Fig. 3 is an elevation of the right-hand side of the eccentric-support; and Fig. 4 is a face view of the
90 adjusting-cam, showing also its stop-pin.

Inasmuch as this invention relates solely to the means for adjusting an eccentric forming part of the mechanism for driving a feed-bar, and inasmuch as the construction of the con-
95 necting devices between the eccentric and feed-bar forms no part of the invention, such devices are not shown in the drawings. The connecting devices may be of the general form shown in United States Letters Patent 100

No. 413,699, dated October 29, 1889, or of the improved form shown and described in application of Charles H. Willcox filed August 10, 1895, Serial No. 558,851.

5 A represents the main shaft (or it may be any suitable shaft) of a sewing-machine journaled in bearings of the hollow arm B, carried by the vertical standard B' and carrying the feed-eccentrics E E'. The former is designed to impart to a feed-bar its horizontal motions through a pitman Q and other suitable connecting mechanism, while the latter imparts the rising-and-falling movements through a pitman Q'. The eccentric E is the adjustable eccentric, the length of stitch being obviously proportional to its throw. As shown, it is formed in one piece with the disk E², herein termed the "eccentric-support," and has a shaft-hole enough larger than the shaft A to permit the desired range of lateral displacement. Adjacent to support E² is another disk F, herein termed the "adjusting-cam," which is supported loosely upon the hub of a wheel G, which is fast on the main shaft. As shown, wheel G is in one piece with a driving-pulley H, but that is merely a matter of convenience.

Eccentric E is attached to fast wheel G, and consequently to the main shaft, by means of screw-pins e, passing through the support E² and cam F and tapped into wheel G. These screw-pins, however, pass through radial slots e' in support E², so that the latter can move for a limited distance radially of the shaft, and through concentric slots f in the cam F, so that the latter can turn relatively to the shaft through an arc limited by the length of the slots. To hold these adjustable parts from slipping, spring friction-washers e² are placed under the heads of screw-pins e. Support E² has on the face adjacent to the cam F a crank-pin h, carrying an antifric-tion-roller h', which engages in an eccentric or cam groove f' in cam F.

45 Such being the construction and relative disposition of the parts it is obvious that when the cam F is turned axially with reference to the shaft the edges of cam-groove f', acting on pin h, shifts the position of support E² and eccentric E transversely across the shaft A, increasing or diminishing the throw of the eccentric according to the direction in which the cam is turned. In order to turn the cam relatively to the shaft, sufficient force must be exerted to overcome the resistance of friction-washers e².

For the purpose of making the adjustment the cam is provided with a peripheral notch k, and adjacent to the periphery of the cam is a stop-pin k', supported on the end of a flat spring k² in a hole in the casing and having a knob on the outside of the latter and a dog or tooth on its inner end. Pin k' is normally held out of engagement with the notch k by means of the spring k². To change the adjustment of the feed-eccentric, the operator presses in the stop-pin k' and turns

shaft A by means of hand-wheel A' until the point of the pin snaps into the notch k. He keeps his finger firmly pressed on the pin k', thus holding the cam stationary, while he turns the shaft forward or backward, according as it is desired to increase or diminish the throw of the eccentric. In this movement crank-pin h traverses the cam-slot f', effecting the desired adjustment.

In order that the adjustment may be effected accurately, it is necessary to provide a scale or indicator of some sort. To this end the rim of wheel G is provided with a series of graduated marks each of which is marked with a number indicating in this case so many stitches to the inch. These marks are so placed with reference to the stop-pin k' and notch k and with respect to an aperture g or window in the casing opposite wheel G that when the cam is engaged by the stop-pin the number then appearing through the aperture indicates the number of stitches to the inch the machine is making. The operator can thus ascertain readily the length of stitch to which the machine is adjusted, and to change to a longer or shorter stitch turns the shaft (while holding the cam stationary) until the desired number appears through aperture g.

In the construction shown the cam has two notches k at opposite sides of its periphery, and the scale of figures representing different lengths of stitch is duplicated on opposite sides of wheel G, so that in any case it will only be necessary to turn the main shaft through a distance less than half a revolution before the stop-pin engages one of the notches.

Obviously the details of construction herein shown and described may be modified within wide limits without departing from the spirit of the invention.

Having now particularly described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a feed mechanism for sewing-machines, the combination with a rotating shaft, of an eccentric connected with said shaft so as to rotate therewith, but adjustable radially thereof, an adjusting-cam mounted loosely on said shaft, frictional clamping devices for holding said cam and eccentric in their adjusted positions, and a connection between the cam and eccentric whereby the rotation of the cam relatively to the eccentric shifts the latter's position radially of the shaft, substantially as described.

2. In a sewing-machine, the combination with a rotating shaft, of an eccentric connected therewith for rotation but adjustable radially thereon, an adjusting-cam rotatable on said shaft, a connection between the cam and eccentric whereby the rotation of the cam relatively to the eccentric shifts the latter radially of the shaft, and a graduated scale for indicating the extent of movement of the cam relatively to the eccentric, substantially as described.

3. In a sewing-machine the combination with a rotating shaft, of an eccentric adjustable radially thereof, an adjusting-cam rotatable on said shaft, frictional clamping devices for holding said eccentric and cam in their adjusted positions, and a stop-pin or catch for engaging and holding said cam against the friction of said clamping devices so that the shaft and eccentric can be turned, and the position of the latter shifted radially while the cam is held stationary, substantially as described.

4. In a sewing-machine the combination with a rotating shaft, of an eccentric adjustable radially thereof, an adjusting-cam capable of rotation on said shaft, and having a cam-groove, a crank-pin on said eccentric entering said groove, frictional clamping devices for holding said cam and eccentric in their adjusted positions and means for shifting the position of said cam axially with reference to the eccentric and shaft, substantially as described.

5. In a sewing-machine, the combination with a rotating shaft, of a feed-eccentric adjustable radially thereon, an adjusting-cam connected with said eccentric and adjustable

axially on said shaft but normally rotating therewith, a disk fast on said shaft carrying a graduated scale for indicating the relative positions of the shaft and eccentric, and a catch or stop-pin for holding the cam stationary while turning the shaft to change the adjustment of the eccentric, substantially as described.

6. The combination of the rotating shaft, the eccentric and its support adjustable radially thereof, a cam mounted on and adjustable axially of said shaft, and having a cam-groove, a crank-pin on said eccentric-support entering said groove, a disk fast on the shaft, screws passing through radial slots in the eccentric-support and concentric slots in the cam and entering threaded holes in said disk, and friction-washers surrounding the shanks of said screws, substantially as described.

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

CHAS. H. WILLCOX.
STOCKTON BORTON.

Witnesses:

J. PARMLY,
J. H. COOKE.