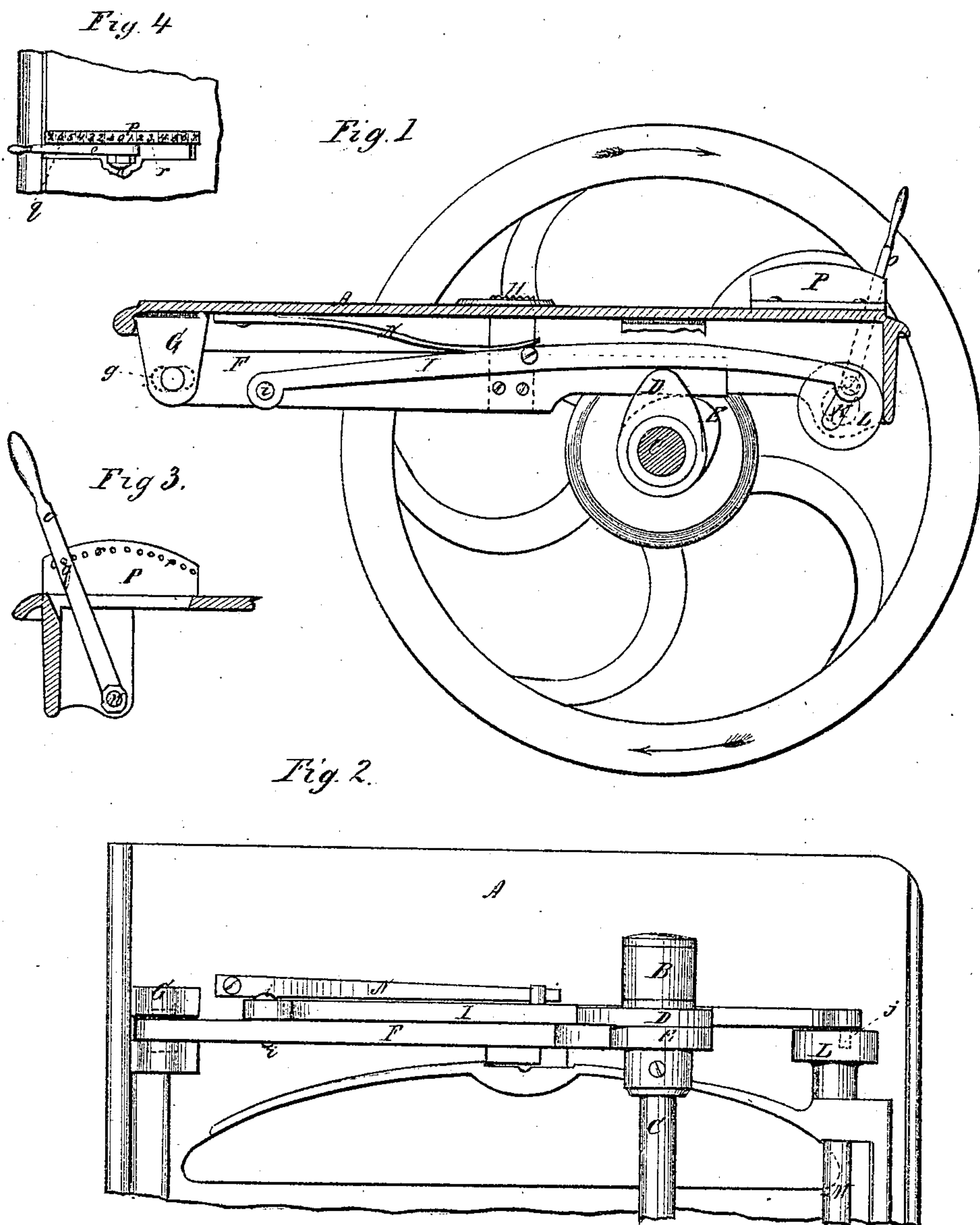


G. A. FAIRFIELD.  
FEEDING MECHANISM FOR SEWING MACHINES.

No. 107,019.

Patented Sept. 6, 1870.



Witnesses:  
H. C. Kretz  
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# UNITED STATES PATENT OFFICE.

GEORGE A. FAIRFIELD, OF HARTFORD, CONNECTICUT.

## IMPROVEMENT IN FEEDING MECHANISMS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. 107,019, dated September 6, 1870.

*To all whom it may concern:*

Be it known that I, GEORGE A. FAIRFIELD, of Hartford, in the State of Connecticut, have invented certain Improvements in Sewing-Machines; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My improvements relate to the mechanism for producing a simple and efficient feeding motion, for affording a cheap and simple reversible feed, and to combining therewith means for measuring the lengths of stitches and equalizing them both in feeding forward and backward.

In the accompanying drawings, which exhibit only so much of a sewing-machine as is necessary to illustrate my invention, A represents a partial view of the table; B, the hanger for supporting one end of the main shaft C of the machine. This shaft carries the cam-piece or double cam D E, which in its revolution lifts at the proper periods the levers F I for imparting the feed to the cloth, the lever F having secured to it or being made integral with the toothed or roughened surface H, as shown. The lever F, as will be seen, is at one end hung upon a pin or pivot secured to a hanger, G, but in such a manner as to allow its other end to drop freely, so that it may rest upon the cam or swell E for the purpose of being momentarily lifted by such cam just before and during the period when the forward motion of the feed takes place, the cam being so formed that at all other times the toothed feeding-surface shall be beneath the surface of the table, and consequently out of contact with the cloth. In other words, the feeding device moves up and down very quickly and before the needle can get down near the cloth, and this may be, in fact, before it commences to descend. This is because the lifting part of the cam is of short length, the remainder of the periphery being concentric and permitting the feed-dog to drop by gravity. To give the forward-and-backward movement to the feed-dog, it is slotted, as shown at g, and I swing from it a lever, I, pivoted thereon, as shown at i. This lever has a pin at its other end, which plays in a slot, K, formed in a disk or plate, L, secured, as shown in Figure 2, to the

end of a shaft, M. A spring, N, bears downward, as shown, upon this lever.

When the parts are in the positions shown in Fig. 1 the feed has just taken place, the cam E, which lifted the dog H, having performed its duty, and the cam D, by lifting the lever I, having shifted the dog to the right by the rising of the pin j in the inclined slot K, this rising causing the positive movement to the right of lever I, which positively carries with it the lever F and its dog H. When the further revolution of the shaft relieves these levers from their respective lifting-cams the spring forces lever I downward and bears just enough in front of the pivot to force lever F down, if required, or to make its descent certain, the slot K and pin j compelling it at the same time to take a backward motion to be ready for the next feeding action, this backward movement necessarily carrying with it the lever F and feeding-dog H.

To vary the feed it is only necessary to vary the degree of inclination relatively to a vertical line of the slot j. This is effected by turning on its axis the shaft M, to the opposite end of which I attach a spring-handle, O, which passes up through a slot or opening in the table, as shown, and by means of which the operator may turn the shaft and its slotted plate or disk, so that the slot j shall assume more or less of an inclined position, and consequently give more or less extent of feed, as may be desired. An arched piece, P, notched to receive a detent on the handle o, and graduated, as shown, (preferably on its top or arched edge,) is affixed to the table on its upper side, and the detent or pin q on the handle lodges in one of the notches or holes r when the shaft and slot have been turned to the position required, and secures it in such position until a change of feed is wanted, when it is shifted to another notch.

The simplicity, positiveness, and efficiency of this feed are found in practice to be of great value. Nothing but the actual wear of the parts can affect it, and it is not liable to any derangements due to coiled springs or to any of the ordinary causes of disturbance. This construction also results in giving a reverse feed by simply revolving the main shaft in the reverse direction, because in turning one way the dog is lifted before the rise of the pin in the inclined slot, and in turning the other way the



dog is lifted before the descent of the pin in the slot; but it is not always (for other reasons) advisable to drive the shaft in the reverse direction, as in some constructions of machines the needle or shuttle or other parts may not be properly timed in their motions relatively to the feed.

By my construction, as above described, of the feeding devices I get a perfect reversible feed without reversing the movement of the shaft. This remarkable feature flows from the described novel mode of operating and graduating the same; and to effect this reversal no alteration whatever is necessary further than to elongate the slot in the table through which the handle O projects, so that it may be moved far enough to turn the shaft M, so as to cause the slot *j* to incline in the opposite direction to that shown in the drawings. This being done, all the parts precisely as before, except that the lever I in rising must move to the left, instead of to the right, and carry the lever F and dog H with it in the same direction. To adapt it to this reversal of feed, the scale on the arch P is graduated equally both ways from the zero-point at its center, and by this simple means the operator has but to turn the handle from a given figure at the right to the same figure at the left, or vice versa, to be absolutely certain that he will make the same number of stitches to the inch as was being made before the reversal; nor need there be any stopping or slacking up of the machine either to vary or reverse the feed.

Instead of the slotted disk on the end of the

shaft, a bar with a sliding box might be substituted as an equivalent, or any other equivalent device which would accomplish the same object.

It is well understood that by means of a reverse feed parallel seams of any length may be readily made without taking the goods from the machine, and also that a reversal of the feed for a few stitches runs the seam back upon itself and stitches into the line of stitches previously made, and thus finishes a seam tightly and securely without the need of tying or fastening the ends of the threads.

I claim—

1. As a means for feeding, the combination of levers F and I and their operative cams, spring N, and the adjustable slotted disk or its equivalent, substantially as shown and described.

2. The longitudinal shaft M, its slotted disk, and adjusting-spring handle, when arranged in connection with the bed of the machine for adjusting and holding in position the disk, as shown and described.

3. As a means for reversing, graduating, and equalizing the feed, the combination, with the feeding-levers F and I and their cams, of the shaft M and its slotted disk, lever O, and graduated notched plate P, substantially as shown and described.

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