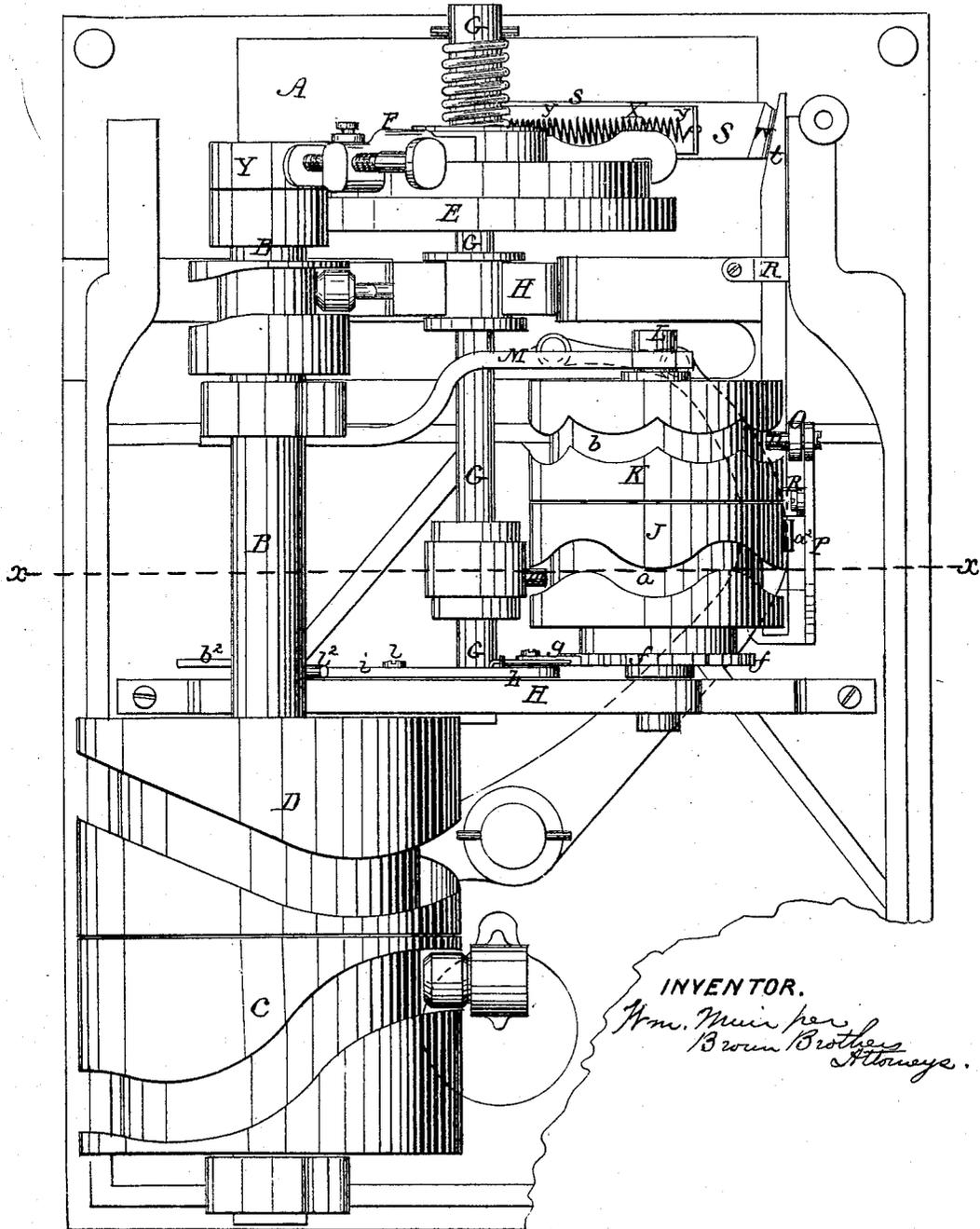


W. MUIR.  
Sewing-Machines.

No. 147,152.

Patented Feb. 3, 1874.

FIG. 7.



INVENTOR.

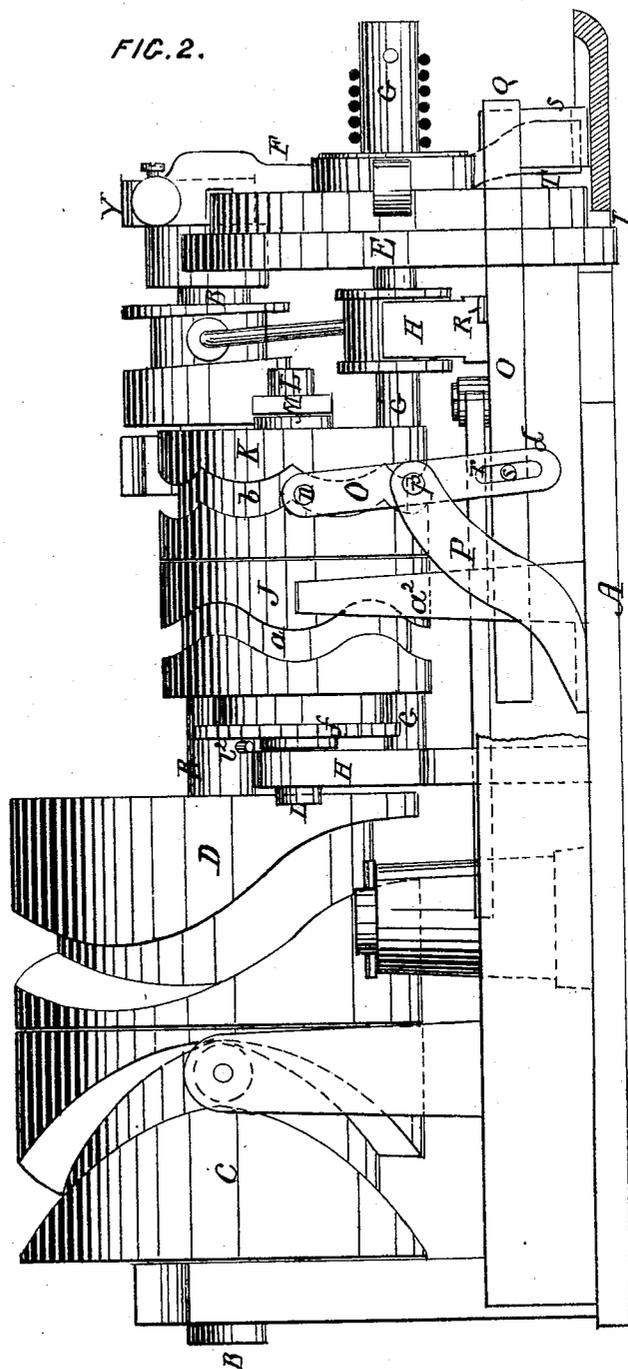
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FIG. 3.

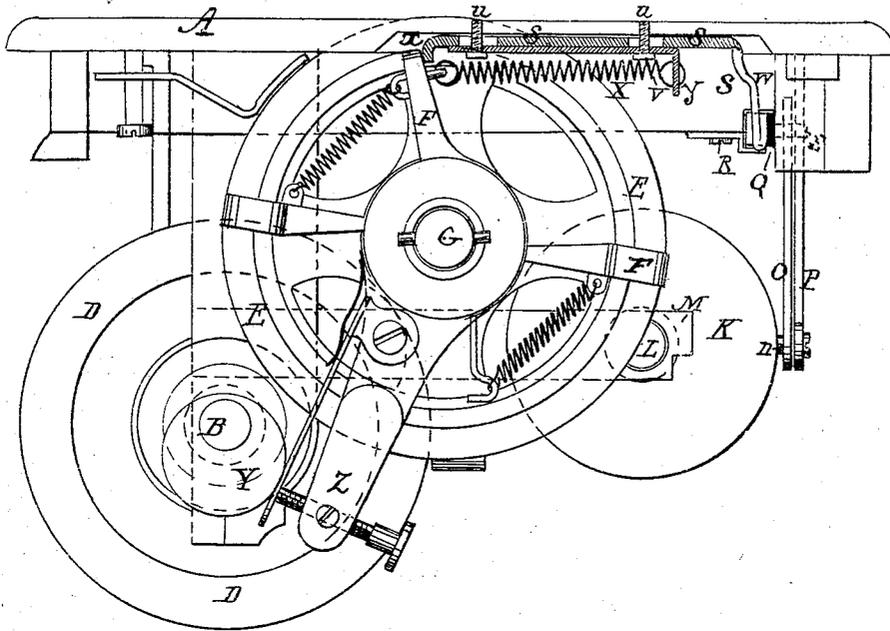
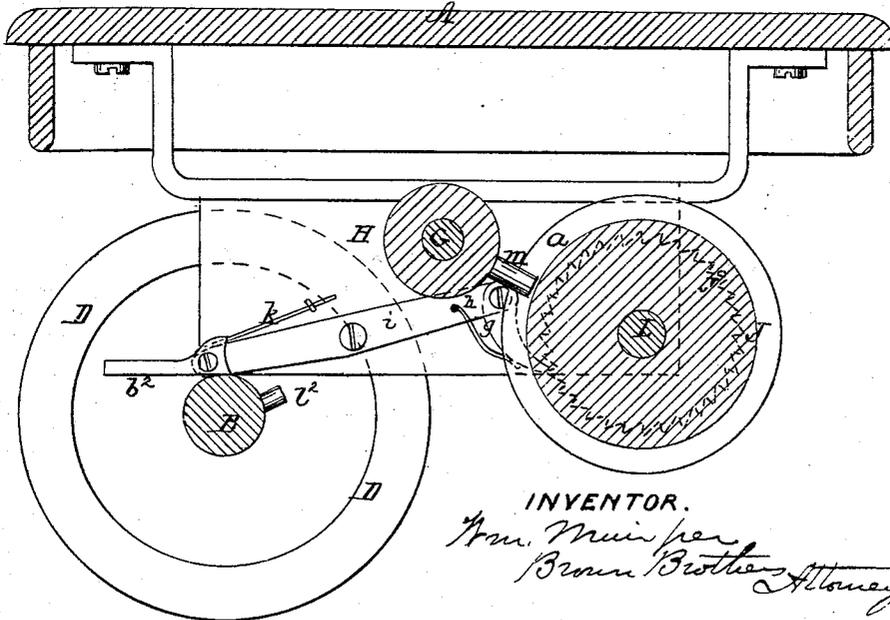


FIG. 4.



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# UNITED STATES PATENT OFFICE.

WILLIAM MUIR, OF MONTREAL, CANADA.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **147,152**, dated February 3, 1874; application filed January 29, 1874.

*To all whom it may concern:*

Be it known that I, WILLIAM MUIR, of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Sewing-Machines; and that the following description, taken in connection with the accompanying plates of drawings hereinafter referred to, forms a full and complete specification of the same.

The present invention relates to ordinary sewing-machines having a wheel-feed; and it consists, first, in the application to such sewing-machines of mechanical devices, to be hereinafter described, that are adapted to receive motion through the driving-shaft of the machine, and are so arranged that when operated they move the feed-wheel laterally across its plane of revolution without interfering with the ordinary feed of the feed-wheel, causing thereby a lateral feed or movement of the fabric being sewed under the plane of movement of the needle; second, in the application to such sewing-machines of mechanical devices, to be hereinafter described, that are adapted to be moved through the driving-shaft of the machine, and arranged, in connection with the mechanism for rotating the feed-wheel, to limit the action of such mechanism on the feed-wheel, and thus to automatically vary the extent to which the goods being sewed are fed forward to the needle at each stroke of the feed-wheel.

In the accompanying plates of drawings my improvements in sewing-machines are illustrated.

Figure 1, in Plate 1, is a plan view of the under side of a wheel-feed sewing-machine with my improvements applied thereto; Fig. 2, in Plate 2, a view from one side of the parts shown in Fig. 1, Plate 1; Fig. 3, in Plate 3, an end view; and Fig. 4, a transverse section in plane of line *x x*, Fig. 1, Plate 1.

A in the drawings represents the bed-plate of a wheel-feed sewing-machine, upon the under side of which is arranged the horizontal driving-shaft B, carrying cams C and D, respectively, for operating the needle-bar and the shuttle-carrier of the machine, both of which are arranged and operate in the usual manner, and therefore require no more particular description herein; E, the feed-wheel lo-

cated upon the under side of the bed-plate A, and arranged, except so far as the present improvements pertain, to be actuated as in ordinary sewing-machines; F, the clutch for carrying the feed-wheel forward, constructed and arranged as ordinarily; G, the feed-wheel shaft. This shaft is elongated, and is arranged horizontally to turn in bearings of standards H on the under side of bed-plate A, and through these bearings it is susceptible of being slid forward and backward, moving thereby the feed-wheel across the width of the opening I in the bed-plate, which, to allow of such movement, is somewhat widened. J and K, two wheels fixed to a common shaft, L, one along side of the other. Each wheel J and K is provided with a peripheral cam-groove, *a* and *b*, respectively, and the shaft carrying them is arranged horizontally under the bed-plate A to turn at each end in fixed bearings M H. The position of cam-shaft L is to one side of the feed-wheel shaft G, bringing the feed-wheel shaft between it and the driving-shaft B, but the several shafts are, however, in different horizontal planes. The cam J is for moving the feed-wheel laterally across the line of sewing, and the cam K for varying the forward feed of the feed-wheel. *f*, a ratchet-wheel fixed to cam-wheel shaft L; and *g*, a spring-pawl, to operate or turn the ratchet-wheel *f*, and thus to turn the cams carried by its shaft. This pawl *g* is hung to the inner end *h* of a lever-arm, *i*, hung to a fulcrum, *l*, on the bearing H of cam-wheel shaft L. The outer end of lever *i* is in position to bear across and against the periphery of driving-shaft B, being confined to it by a bent spring, K, properly applied. The shaft B in line of bearing of lever *i* thereon has a cam projection or pin, *l*<sup>2</sup>, to cause, in the rotation of the shaft, a swinging of the lever *i*, and thus, through its pawl, a rotation of the ratchet and cam-wheel shaft, L, for a portion of its periphery. *m* is a stud, projecting from a fixed collar on the feed-wheel shaft G, and into the cam-groove *a* of cam-wheel J. *n* is a stud projecting from one end of a vertical arm, O, hung to a fulcrum-pin, *p*, of a post, P, fixed to the under side of the bed-plate A, and the end *d* of the arm is slotted at *r* and connected with the pin *s* of a horizontal bar, Q, arranged along the under side of bed-plate A, and sup-

ported within guide-loops R. The stud *n* enters the cam-groove *b* of cam-wheel K, and the bar Q extends beyond the plane of the feed-wheel, and its end *t* is of wedge shape toward the face of the feed-wheel. S, a bar or plate, fastened, through slots *u* and set-screws *v*, to the under side of the bed-plate A, in a plane at right angles to the length of the bar Q, and its end *w* bears against the wedge-shaped face *t* of the bar Q, and its other end, *x*, abuts against the arm T of the feed-wheel clutch F. The bar S, through its fastening, above described, while held from detachment, is susceptible of being moved in the direction of its length. Y is a plate, fastened, by screws *u*, to the bed-plate, and it bears against the under side of the bar S. This plate Y is stationary. Bar S moves between it and the plate A, and a spring, X, connected to the arm F, is also connected to S. This arm throws the clutch back after each operation of the cam Y of the driving-shaft B on its arm Z.

By the cam J the feed-wheel is moved laterally, the extent of its lateral movement depending upon the shape of the cam-groove *a*, as is obvious, thereby enabling the machine, with a proper shaped cam-groove, *a*, to sew in a zigzag, serpentine, or other line, varying from a straight line.

By the cam K the bar Q is moved to bring its wedge-shaped face *t* more or less against the end of slide-bar S, and, thus moving it along, reduce or increase the backward throw of the clutch F, and consequently reduce or increase its forward throw through the cam Y of driving-shaft B, from the fact that the more said slide-bar S is moved along toward or beyond the center of rotation of the feed-wheel the less its clutch F can be thrown back, and vice versa. This reduction or increase of the forward feed of the feed-wheel necessarily reduces

or increases the length of stitches, and it is obvious that, with a proper shaped cam-groove, *b*, to operate the wedge-bar Q, taken in connection with the lateral movement of the feed-wheel, as described, the feed of the fabric can be made automatically to so vary as to produce a uniform length of stitches, whatever may be the line or direction in which the machine is sewing from the operation of the lateral feed, as aforesaid.

*a*<sup>2</sup> is a bent spring bearing on the periphery of cams J K to prevent any backward throw. *b*<sup>2</sup> is a lever hung to the outer end of the arm *h*, in a position so that it may be turned and cause the arm *h* to be released or removed from the path of the arm or projection *l*<sup>2</sup> of shaft B. The lever *b*<sup>2</sup> bears on a concentric portion of the shaft B.

To remove the cams J K for substituting others of a different pattern, it is only necessary to uncover the bearings of their journal or shaft.

Having thus described my improvements in sewing-machines, I shall state my claims as follows:

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The cam K, ratchet-wheel *f*, and the driving-shaft B, in combination with the wedge-shaped bar Q, slide-bar S, and arm F of feed-actuating clutch, substantially as described, and for controlling the length of the stitches.

2. The cams J K, driving-shaft B, feed-wheel shaft G, ratchet-wheel *f*, pawl *g*, bar Q, slide-bar S, and clutch F, when all are combined, constructed, and arranged together substantially as and for the purpose described.

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A. I. HELLIWELL.