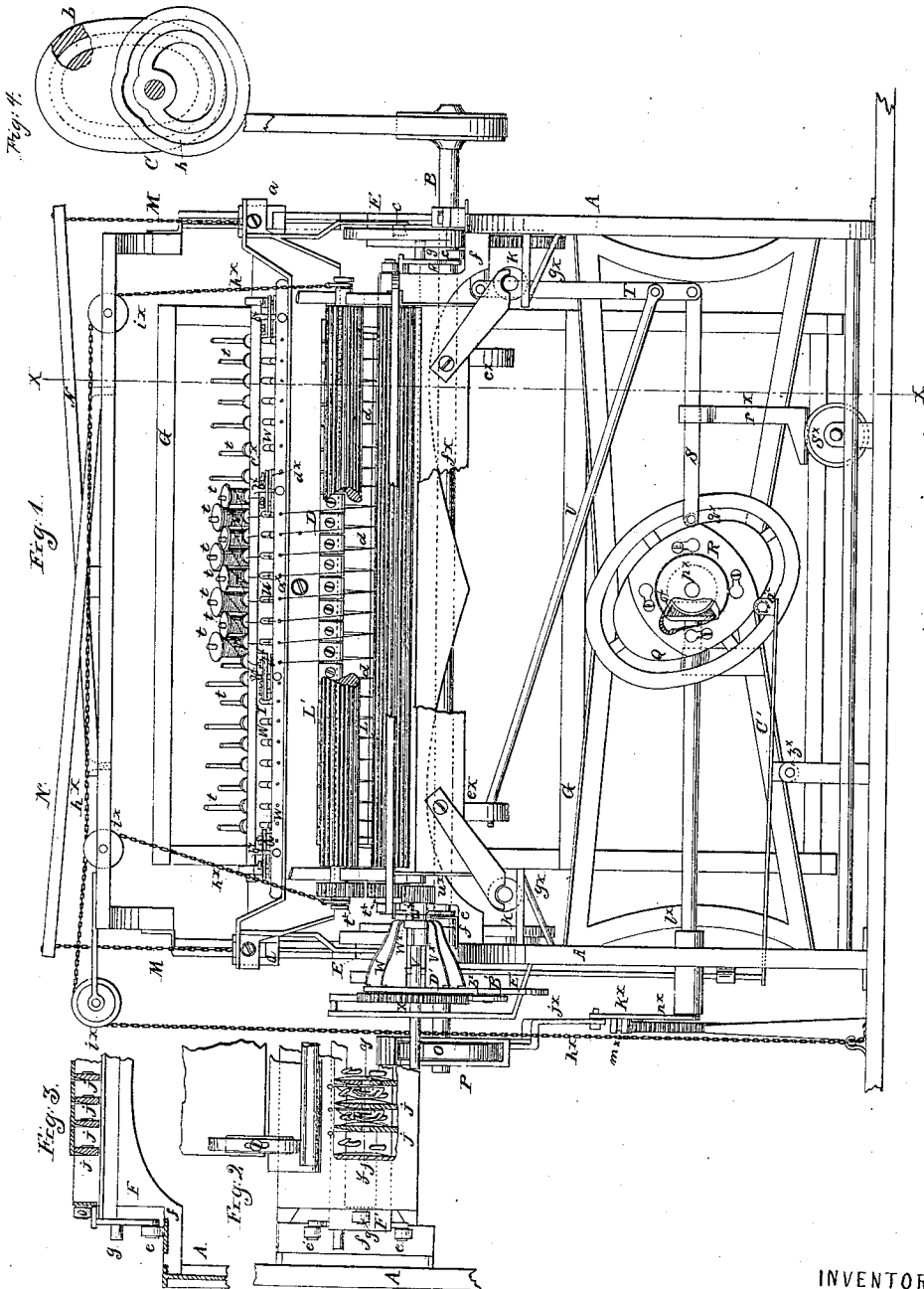


W. MUIR.
SEWING MACHINE.

No. 89,064.

Patented Apr. 20, 1869.



WITNESSES:

A. W. H. H. H. H.
W. A. Roberts

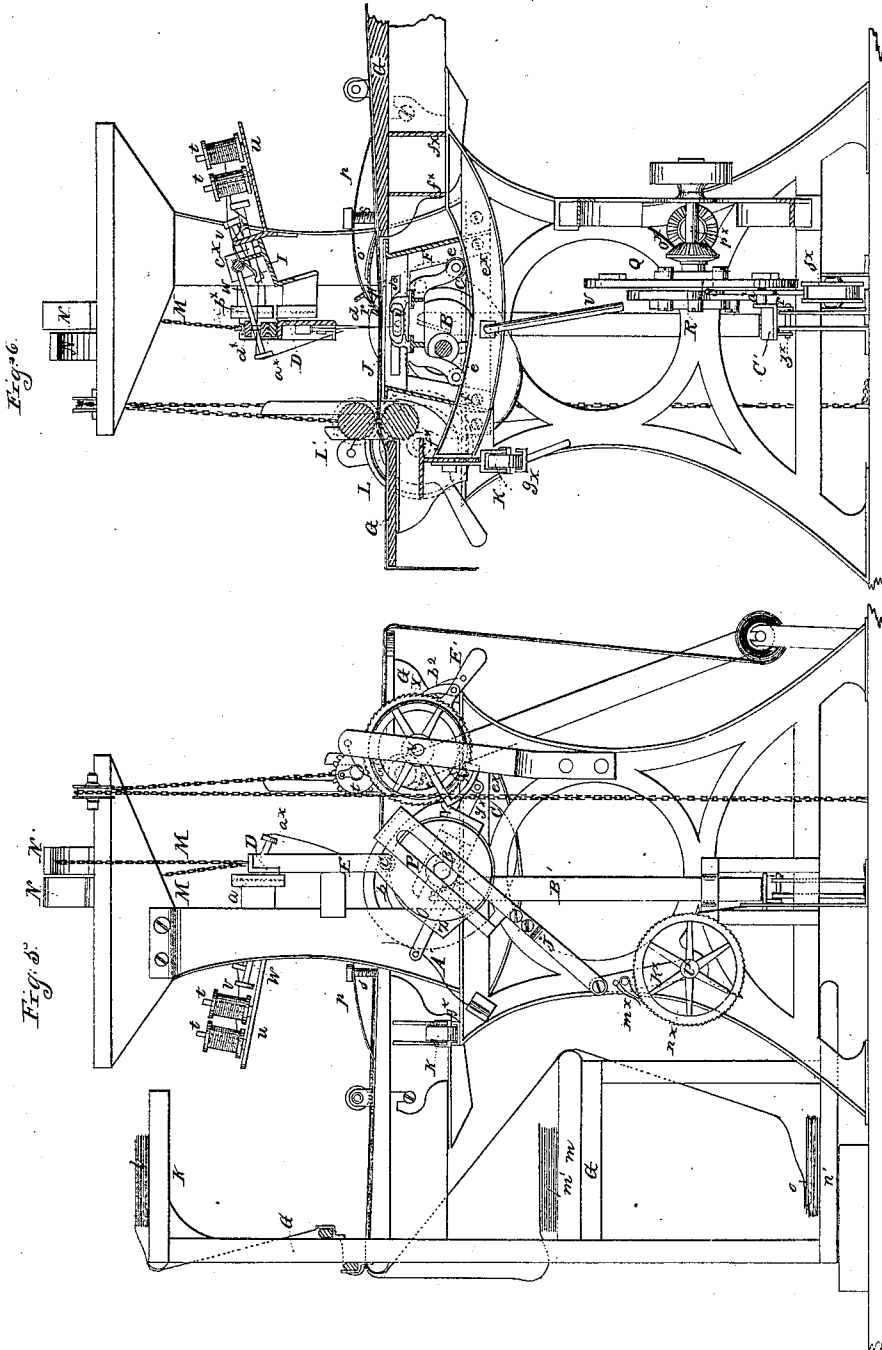
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WITNESSES:

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United States Patent Office.

WILLIAM MUIR, OF MONTREAL, CANADA.

Letters Patent No. 89,064, dated April 20, 1869.

IMPROVEMENT IN SEWING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

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 a new and improved Multiple Sewing-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved sewing-machine, in which a plurality of needles and shuttles is employed, for the purpose of making several rows of stitching simultaneously, or at one operation, for embroidery, quilting, &c.

The invention consists in a peculiar construction and arrangement of parts, whereby the needle-bar and shuttle-frame are operated direct from the driving-shaft, and machines of this kind much simplified thereby.

The invention also consists in a new and improved feed-mechanism, and a means for varying the pattern, both of which are also operated in a very direct manner from the driving-shaft.

The invention further consists in a novel construction and arrangement of various detail parts, such as the presser-foot frame, which supports the fabric, &c., which will be hereinafter fully shown and described, whereby the machine is rendered eminently practicable for the purpose designed.

In the accompanying drawings—

Figure 1, Sheet No. 1, is a front view of my invention, a small portion of which is in section, or broken away.

Figure 2 is a plan or top view of a portion pertaining to the same.

Figure 3 is a horizontal section of fig. 2, taken in the line *y y*.

Figure 4 is an inner side view of a cam, pertaining to the same.

Figure 5, Sheet No. 2, is an end view of the invention, in elevation.

Figure 6 is a transverse vertical section of the same, taken in the line *x x*, fig. 1.

Similar letters of reference indicate like parts.

A represents the frame of my improved multiple sewing-machine, which frame may be constructed of iron, wood, or other suitable material, and of any proper dimensions.

B is the driving-shaft, fitted horizontally in the frame A, and having upon it two cams C C, one near each end, within the side pieces of the frame.

These cams are what may be termed double ones, as they perform two different or separate functions, to wit, the moving of the needle-bar, and operating the shuttle-frame.

The needle-bar, which is designated by D, works in guides *a a*, permanently attached, one to each side of the frame A, and has an up-and-down movement

given it, by oval eccentric grooves *b b*, at the outer sides of the cams C C, a pendent bar, E, being at each end of the needle-bar, provided with rollers *e*, at their lower ends, which work in the grooves *b*. (See fig. 4.)

These grooves, *b*, of the cams *c*, not only give the proper movement to the needle-bar, but also give it in proper time for operating the needles in unison with the other parts of the machine.

The shuttle-frame, designated by F, has rollers, *e*, at its lower end, and these rollers work on ways *f f*, in the frame A, an arm projecting from each end of the shuttle-frame, provided each with a friction-roller, *g*, which rollers work in grooves *h*, at the inner sides of the cams C.

The shape of these grooves *h* is clearly shown in fig. 4, and they impart a reciprocating movement to the shuttle-frame.

The shuttles are designed to work between parallel guides *j*, which are permanently secured in the frame A.

So far as the operation of the needles and shuttles, and the forming of the stitch are concerned, there is nothing essentially new, the needles all being secured in position in the needle bar, side by side, the shuttles being also placed side by side in the shuttle-frame.

G represents the framing, which supports the fabric in the machine, *k* being a shelf, which supports the lining *l*, *m* a shelf which supports the wadding *m'*, and *n* a shelf which supports the canvas, or other material *o*. (See fig. 5.)

The wadding *m'*, it will be seen, passes between the lining and canvas, and the three thicknesses of material pass under a presser-foot, H, (see fig. 6,) which extends the whole width of the framing G, and at the rear side of or directly behind the needle-bar D, as shown clearly in fig. 6.

This presser-foot is composed of a plate, *n*, attached at its ends to strips *o' o'*, the rear ends of which are secured to the framing G, one at each side, and over the ends of the plate *n* there are placed springs *p p*, the front ends of which are connected by a bar, *r*, the springs *p p* having screws *s* passing through them into framing G.

By turning these screws, the bar *r* may be made to press more or less hard on plate *n*, and the pressure of the latter on the different layers of material, graduated as desired. This will be fully understood by referring to fig. 6.

The spools, shown in red, are placed on upright rods *t*, in an inclined board, *u*, at the rear of the needle-bar, the threads *v* passing through eyes in rods *w*, in a frame, I, at the rear of the needle-bar, thence through holes in a bar, *a^x*, which is attached to the front ends of arms *b^x*, the rear ends of the latter being secured to a shaft, *c^x*, in the frame I, the arms *b^x* passing through clamps *d^x*, attached to the upper part of the needle-bar D.

The bar a^x , it will be seen, rises with the needle-bar D, and gives the proper tension to the threads.

One part of the framing G is at the rear of frame A, and the other part is at the front of said frame, and these two parts are connected by a metallic curved bar, e^x , having bars f^x attached, which are parallel with the driving-shaft B.

The space between the two parts of the framing G is covered by a cloth plate, J, perforated, of course, to allow the needles to pass through, said cloth plate being attached to frame A, and covering the shuttle-frame, shuttles, and shuttle-guides. (See more particularly fig. 6.)

This framing G is, to a certain extent, independent of the frame A, so that it may have a lateral vibrating movement given it, and to favor this movement, said framing is provided with rollers K, which rest on ways g^x , on frame A. (See figs. 1, 5, and 6.)

L L' are the feed-rollers, which are placed in the front part of the framing G, one directly over the other, in the same axial plane.

The lower roller, L, works in fixed bearings, but the upper one, L', is adjustable, or allowed to rise and fall in its bearings, and may be elevated entirely free from the lower feed-roller L, when desired, by means of chains h^x and pulleys i^x , as shown clearly in fig. 1.

The needle-bar D is suspended, by chains M, from springs N, on the top of the frame A, and by this means the up-and-down movement of the needle-bar is greatly facilitated.

The feed-rollers L L', being attached to the front part of the framing G, move laterally with it, and this lateral movement is given said framing as follows:

On one end of the driving-shaft, B, of the machine there is secured a cam, O, which works within a yoke, P, having an arm, j^x , attached, the outer end of the latter being pivoted to the upper end of a radius bar, k^x , placed loosely on a shaft, l^x .

This radius bar k^x has a pawl, m^x , attached, which engages with a ratchet-wheel, n^x , on shaft l^x , and communicates motion thereto.

The inner end of the shaft l^x is connected by bevel gears o^x , with a shaft, p^x , on the front end of which two cams, Q R, are secured.

The cam Q is an oval groove, shown clearly in fig. 1, and in this groove the friction-roller q^x , of an arm, S, is fitted and works.

The outer end of the arm S is pivoted to the lower end of a pendent bar, T, connected by a joint to the frame A, and this pendent bar T is connected by a rod, U, with one of the curved bars e^x , which connects the two parts of the framing together.

It will be seen from the above description, that the revolutions of the cam Q give a laterally vibrating movement to the framing G, and consequently to the feed-rollers L L', and the fabric operated upon on the framing G, and this lateral movement of said framing and fabric causes the stitching to be done in waved, or zigzag rows.

The arm S is supported by a bar, r^x , which rests upon a friction-wheel s^x , as shown in fig. 1.

The feed-rollers L L' are connected at one end by gears t^x , and receive their motion as follows:

The gear of the lower feed-roller L meshes into a pinion, u^x , placed on a shaft, V, in the front part of the framing G, said pinion u^x being provided with quite a long head, or hub, v^x , on which the inner end of a drum, W, is fitted loosely, so that the head, or hub v^x may slide within the drum without imparting any lateral movement to the latter, but said head or

hub being provided with feathers w^x , one or more, to cause the drum to rotate the shaft V.

The outer end of the drum W is fitted loosely on shaft V, and has a ratchet-wheel, X, attached to it, into which a multiple pawl, x^x , catches, and by moving the ratchet-wheel X, and drum W, the pawl rotates shaft V, and the feed-rollers L L'.

The pawl x^x is operated as follows:

It is connected to the outer end of an arm, y^x , the inner end of which is attached to a yoke, Y, in which a cam, Z, on the driving-shaft B, works. (See figs. 1 and 5.)

This yoke Y has a spring, A', connected to it, which spring has a tendency to keep the inner end of the yoke in contact with the edge or face of the cam.

B' is an upright bar, the upper part of which is bevelled, as shown clearly by the dotted lines in fig. 5, and is directly behind the yoke Y.

The lower end of the bar B' rests upon a lever, C', having its fulcrum at z^x , and the inner end of the lever C' has a friction-roller, a^2 , attached, against which the cam R acts, and causes the bar B' to rise and fall behind the yoke Y.

This bar B' performs the function of regulating the movement of the feed-rollers L L', for as the bar B' is raised, the throw of the pawl x^x is shortened, and *vice versa*, the feed-movement of the rollers L L' is diminished as the bar B' is raised, and hence it will be seen that by a proper cam, R, the length of stitch may be varied as required.

The roller which takes up the quilted fabric is shown in red in fig. 5.

On the drum W, there is fitted loosely a ring, D', having a ratchet, b^2 , attached, which engages with the ratchet-wheel X.

This ring, D', is provided with a handle E. This loose ring, with its pawl, is designed to serve as a hand-feed.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. The cams O C, constructed as described, in combination with the shaft J, and the needle-bar D, and shuttle-frame F, arranged respectively with tension devices and shuttle-guides, all operating as described for the purpose specified.

2. The shuttle-frame F, with rollers e , in combination with the ways $f f$, for the purpose of facilitating the movement of the shuttle-frames, as set forth.

3. The feed-rollers L L', in combination with the pinion u^x , keyed on the shaft V, the drum W, and ratchet-wheel X, placed loosely on said shaft, and the multiple pawl x^x , operated from the driving-shaft B, through the media of the cam Z, yoke Y, all arranged substantially as shown and described.

4. The combination with the yoke Y, of the bar B' of taper form, at its upper end, and operated by the pattern-cam R, for the purpose of regulating the feed-movement of the rollers L L', substantially as set forth.

5. The cam Q, arm S, bar T, and rod U, operated from the driving-shaft B, through the media of the cam O, yoke P, pawl m^x , on radius bar k^x , substantially as shown and described, for giving lateral movement to framing G.

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Witnesses:

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ROBT. COCKBURN.