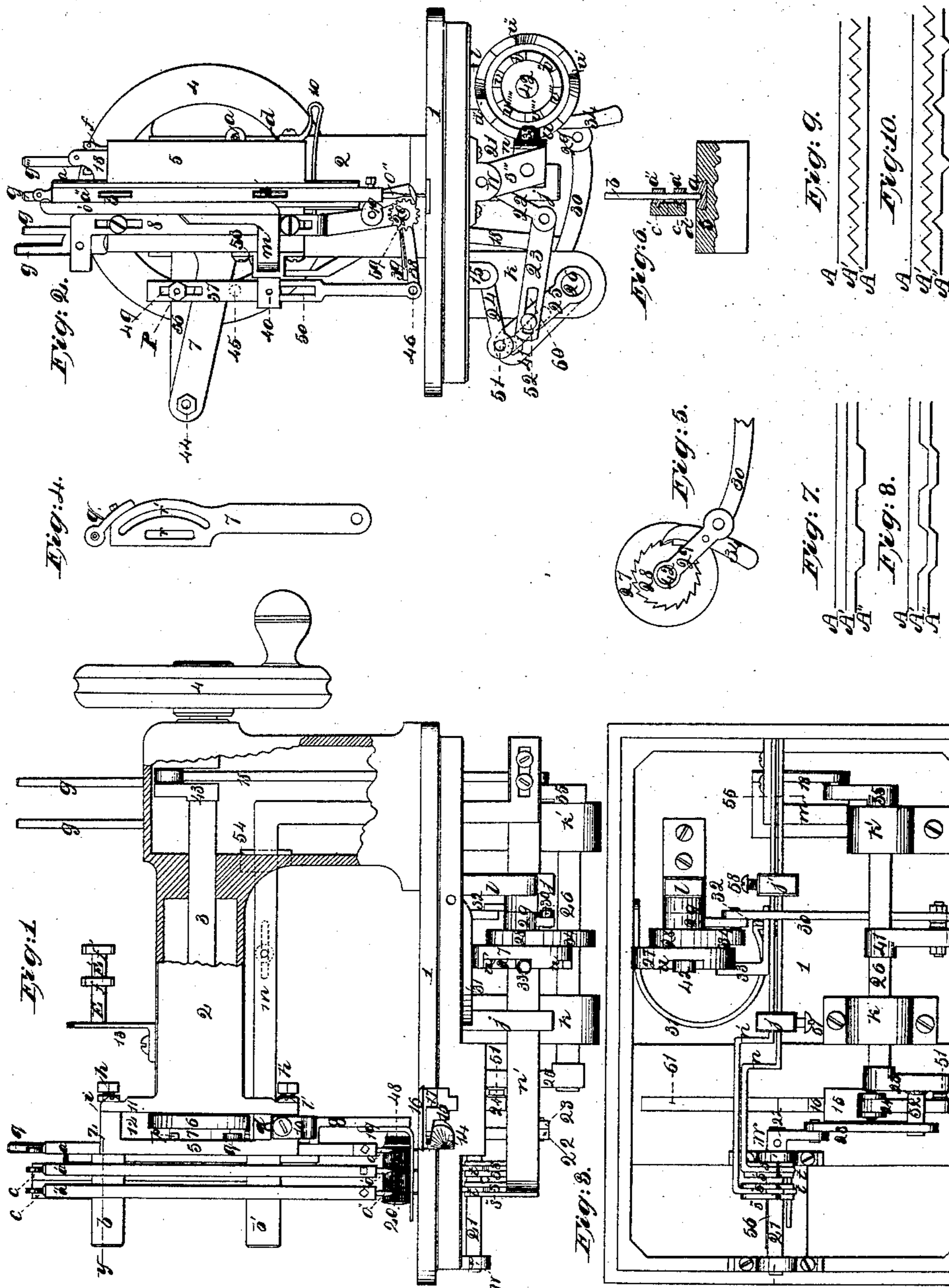


L. HEERY.
Sewing Machine.

No. 94,740.

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IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 94,740, dated September 14, 1869.

To all whom it may concern:

Be it known that I, LUKE HEERY, of Hinsdale, in the county of Berkshire and State of Massachusetts, have made and invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which like marks indicate like parts, and whereof—

Figure 1 is a sectional side elevation; Fig. 2, an end elevation of the same; Fig. 3, a plan of the cloth-plate and mechanism thereunder inverted; Fig. 4, a detached view of the slotted lever whereby rotary is converted into reciprocating motion; Fig. 5, a detached view of a portion of the mechanism whereby the additional needles are varied laterally; Fig. 6, a horizontal section through line *yz* of the needle-bars, their supports, and a part of plate 5; and Figs. 7, 8, 9, and 10 illustrate some of the various directions of the seams that may be sewed with my improved machine.

My invention consists in combining, on one machine, two or more needles, one of which—the first or principal—has the usual vertical motions and sews the “shuttle” or “lock” stitch, while the others—second and third, &c.—sew a single-thread chain-stitch, and, in addition to the usual vertical motions, have or may have lateral motions, by which arrangement a number of seams, straight or sinuous, but all having the same general direction, may be sewed at the same time, the object thereof being to facilitate “quilting,” “cloth-finishing,” “embroidering,” or other work requiring several seams or rows of stitching running in the same general direction.

To enable others skilled in the art to practice my invention, I describe the same as follows:

In the accompanying drawings, the part marked 1 represents the cloth-plate; 2, the frog; 3, the main shaft, provided forward with a disk or crank, 6, and rearward with a crank or eccentric, 43, and also with a grooved balance-wheel, 4.

Attached to plate 11, part of the frog, and leaving an opening, 12, between them, is the notched plate 5, provided on its face with a vertical dovetail groove, wherein, of the

needle-bars *a a' a''*, plays the first or principal one, *a*. *b b'* are brackets, projecting from bar *a* and passing through mortise-slots in bars *a' a''*, and allowing thereto independent lateral motions, while subjecting the whole gang to the same vertical motions. From the rear of plate 11 projects a limb, 36. 7 is a lever, provided with slots *r r'*, Fig. 4, and pivoted at 44 to limb 36. The slotted end of lever 7 passes between plate 5 and disk 6, from which latter an eccentric pin or stud projects into slot *r'*, while another pin or stud, projecting from bar *a* through a slot in plate 5, enters slot *r*, whereby, from the rotary motion of shaft 3, a reciprocating motion is communicated to all the needle-bars *a a' a''*.

q is a small eyelet-headed piece, which, attached by a set-screw through its slotted shank to the forward part of the bar 7, serves as a variable “take-up” for the upper thread of the primary needle *o*. *d* is a small loop made fast to the foot of plate 5, and serves as a guide for the upper thread of needle *o*.

The tension device consists of plate 13, attached to the frog, and provided pins *e e'*, &c., whereon turn respectively the buttons *f f'*, &c. Through plate 13 near the top, and through the buttons *f f'*, &c., are small holes or thread-passages. The thread or needle *o*, proceeding from a spool on holder *g''*, passes through one or more holes in button *f*, through plate 13, loop *d*, take-up *q*, and thence to the needle. The threads of needles *o' o''* proceed through the heads of bars *a' a''*. They do not pass through anything in the nature of loop *d* or take-up *q*. Any requisite degree of tension may be obtained by turning buttons *f f'*, &c.

Parts 8, 9, 10, and 19 constitute the cloth-presser, whereof 8 is a flat bar, attached to the face of plate 5, so as to be moved up and down thereon. 9 is a lever, resting on the head of plate 5, and pivoted to bar 8, for the purpose of raising and holding the presser-foot suspended. 10 is a spring, one end of which is made fast to the bottom of plate 5, while the other rests on a shoulder formed by a curve in bar 8. 19 is the presser-foot, which, made fast to bar 8 and actuated by spring 10, holds the cloth firmly on the surface of plate 1. Through slots or holes in foot 19 pass the needles *o o' o''*, and thence through plate 1.

Parts 20, 37, 38, 39, P, and 48 constitute the feeding apparatus, whereof 20 is the fluted feed-cylinder, attached by an arbor-pin, 59, to the foot of bar 8. Forming a part of cylinder 20 is a ratchet-wheel, 48, whose spring-ratchet 39 is made fast to the short bar 38. Through one end of bar 38 passes arbor-pin 59, while to the other end thereof, at 46, is jointed the slotted bar 37. Bar 37, held in position between lever 7 and projecting loop 53 by pin and slots 40 and 50, is provided in the rear with two studs, 45 and P, the one, 45, being fixed and below lever 7, and the other movable in slot 49 and above lever 7. By this arrangement motion is communicated from lever 7 to the feed-cylinder 20, and the length of stitch is regulated by varying the position of stud P, which is provided with a set-nut for that purpose.

To regulate the play of bar *a* in its dovetail groove, I arrange screws *h h'*, provided respectively with set-nuts *i i'*, which screws pass through plates 11 and 5 and touch the back side of such bar *a*. *g g' g''* are the spool-holders. 16 is the slide-cover of the shuttle-race 17. 14 is the shuttle, provided with the ordinary bobbin and tension loops. 15 is the shuttle driver or carriage, projecting through slot 61 and below plate 1. *k k'* are bearings, wherein rocks shaft 26, provided at one end with a crank, 35, and connected with crank 43 of shaft 3 by the rod 18, which passes through hole 55 in plate 1. At the other end shaft 26 is provided with a crank, 25, and is thence connected with shuttle-driver 15 by rod 24. Thus motion is communicated from shaft 3 to shuttle 14. 23 is a slotted rod, connecting cranks 25 and 22 of shafts 26 and 21, respectively, whereby a rocking motion is communicated to shaft 21, and thence to the loop-holding hooks *t t'*, (the lower parts whereof only are represented,) and which, in combination with the needles *o' o''*, form the well-known "chain-stitch."

It will be observed that crank 25 is provided with two studs, 51 and 52, whence motion is communicated to both the shuttle 14 and hooks *t t'*; but it is necessary that rod 23 be provided with slot 60, (or some equivalent,) allowing stud 52 to move freely therein, or otherwise the hooks *t t'* would be too soon affected by the motions of shaft 26.

To give simultaneous lateral motions to the needles *o' o''* and their respective hooks *t t'*, I provide a device consisting of a variety of parts, viz., *c c', m m', n n', s s' s'' s'''*, 27, 28, 29, 30, 31, 32, 33, 34, and 41, whereof *c c'* are vertical supports, provided with grooves, wherein run tongues projecting from the rear of bars *a' a''*, respectively, Fig. 6. The supports *c c'* are respectively made fast to parts *m m'*, which, running through loops 53 and 54, pass along the back side of frog 2, and thence downward through hole 55 in plate 1, below which plate they are attached to or form a part of pieces *n n'*. The pieces *n n'*, pass-

ing through supports *j j'*, and terminating nearly under needles *o' o''*, are respectively provided at such terminations with lips *s s'* and *s'' s'''*. Through a hole in such lips sufficiently large to allow it to roll or rock freely therein passes the shaft 21, whereon, and between the lips *s s'* and *s'' s'''*, are arranged respectively the hooks *t t'*.

Shaft 21 is provided with a tongue, 56, which enters a corresponding notch or groove in the butts of hooks *t t'*, to prevent its rolling therein, while allowing them to slide longitudinally thereon. Thus, it will be seen, a connection is formed between needles *o' o''* and hooks *t t'*, whereby, if one of the needles be moved laterally, so also, and simultaneously, will be its corresponding hook.

To give these lateral motions, I attach to the lower side of plate 1 a piece, *l*, from which projects horizontally an arbor-pin, 42, whereon I arrange the arm 29 and disk 27, from the face of which latter project one or more series of cams, *u u'*, &c., *v v'*, &c., while on the back thereof is formed a ratchet-wheel, 28, whose ratchet 34 is pivoted to arm 29, so as to latch by weight of its own butt.

Connecting arm 29 with crank 41 on rock-shaft 26 is a rod, 30, through which intermittent motion is communicated to disk 37.

Projecting from the piece *n'* is a shoulder, 32, and a pin, 33. As disk 27 revolves the cams thereon, *u u'*, &c., strike pin 33, whereby needle *o''* and hook *t'* are moved out and away from needle *o*, and when the cams *u u'*, &c., are past pin 33, needle *o''* and hook *t'* are thrown back to their former position by spring 31, arranged for that purpose under plate 1, and pressing against shoulder 32.

It is obvious that the pieces *n n'* may be connected or disconnected, so as to be operated simultaneously or independently by the same or by different sets of cams.

57 and 58 are set-screws, whereby the needles *o' o''* may be made stationary (laterally) at a given distance from the needle *o*.

The sinuosities of the seams *A' A''*, Figs. 7, 8, 9, and 10 will evidently depend upon the nature, size, and relative arrangement of the cams *u u'*, &c., *v v'*, &c., and in these respects they may be almost infinitely varied.

For family use the disk 27 and either one or two of the three needles *o o' o''* may be dispensed with, and a single seam sewed, as with an ordinary machine.

Thus, having described my improved sewing-machine, what I claim therein as new, and desire to secure by Letters Patent, is—

1. One or more supplementary bars, *a' a''*, in combination with the primary bar *a*, supports *c c'*, and hooks *t t'*, substantially as specified.

2. The supports *c c'* and connections *m m' n n'*, arranged and combined with the bars *a' a''* and hooks *t t'*, substantially as specified.

3. In combination with driver 15 and shaft 21, the parts 22, 23, 24, 25, and 26, constructed,

arranged, and operating substantially as specified.

4. The spring 31, in combination with one or more parts, *n n'*, connections *m m'*, bars *a' a''*, and hooks *t t'*, substantially as specified.

5. The disk 27, provided with one or more series of cams, *u u'*, &c., in combination with

one or more bars, *a' a''*, hooks *t t'*, and with parts 26, 28, 29, 30, 34, and 41, all arranged and operating substantially as specified.

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