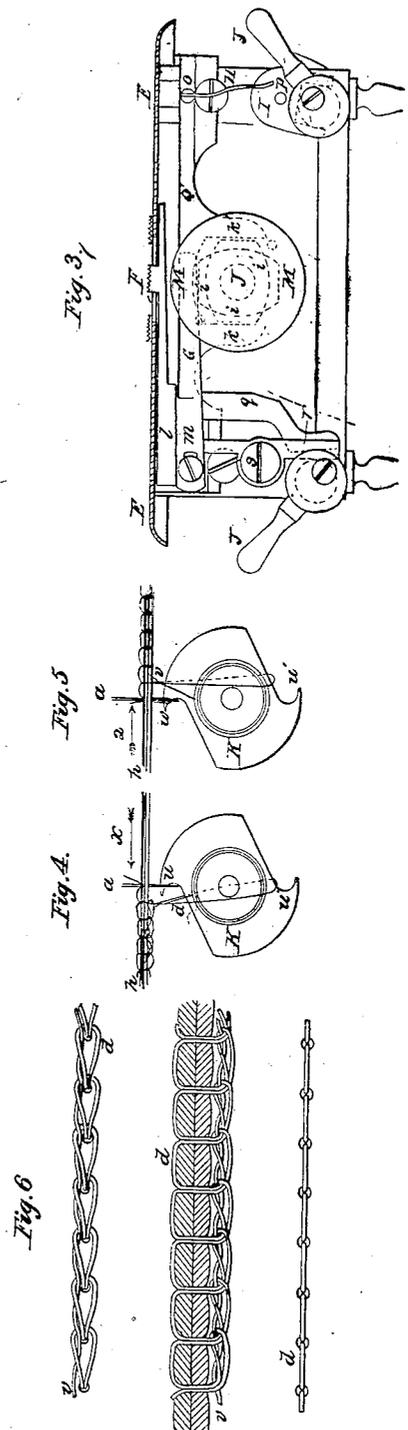
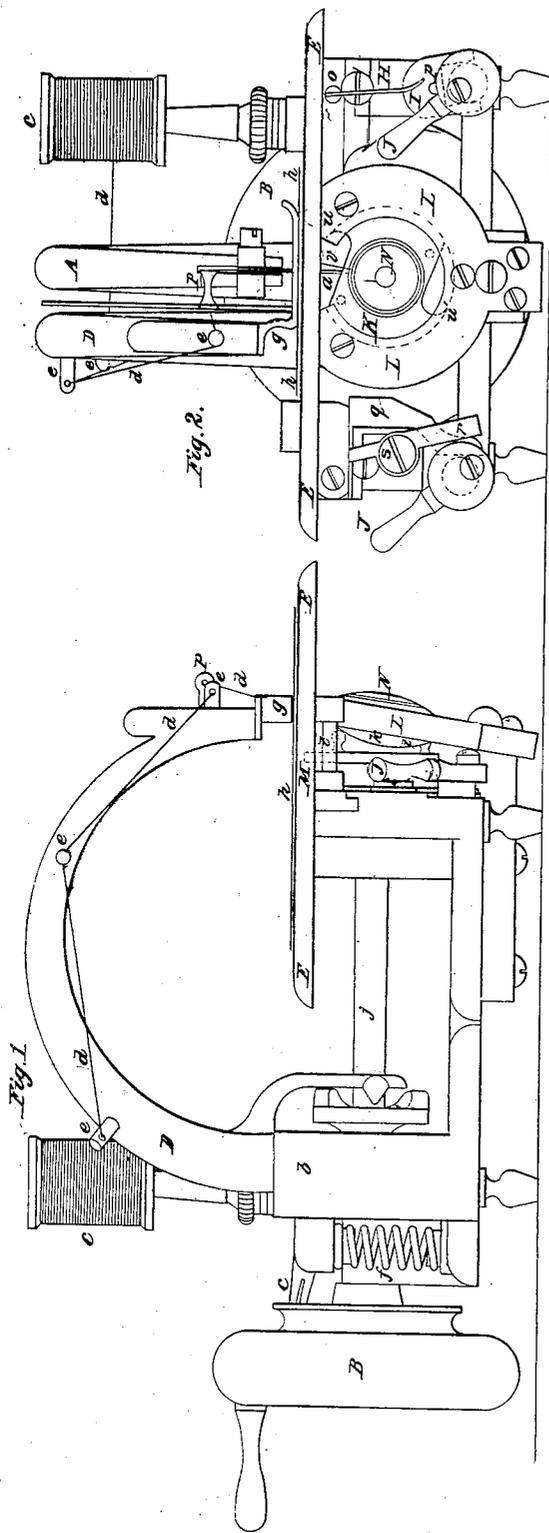


J. E. A GIBBS.  
SEWING MACHINE.

No. 27,214.

Patented Feb. 21, 1860.



# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **27,214**, dated February 21, 1860; antedated August 21, 1859.

*To all whom it may concern:*

Be it known that I, JAMES E. A. GIBBS, of Mill Point, Pocahontas county, and State of Virginia, have 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 same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 represents a side elevation of a sewing-machine constructed according to my improvement; Fig. 2, a front end elevation thereof; Fig. 3, a front end view in part, having the shuttle or thread-case and its frame removed, and showing the cam mechanism for actuating the feed. Figs. 4 and 5 represent, under different arrangements or directions of feed, the double-hook discoidal shuttle and looper in its action relatively to a reciprocating needle for producing different characters of stitch; and Fig. 6, diagrams in illustration of one description of stitch which my improvement is capable of producing.

In the machine represented in the accompanying drawings, the beam or lever A, which serves to give a reciprocating or up-and-down motion at its front end to an eye-pointed needle, *a*, is shown as attached to a rocking shaft, *b*, in the rear, supported in suitable bearings, and which has an arm, *c*, projecting backwardly, that gears with a grooved driving-wheel, B, constructed to give for each revolution of it two double or up-and-down motions to the needle-beam and needle.

The bobbin C, which supplies the thread *d* to the reciprocating needle, is here shown in a vertical position, hung in any desired manner, and having its thread pass through eye-studs *e*, projecting from a pressure-pad beam or lever, D, down to and through the eye of the needle *a*. The pressure-pad lever is shown as corresponding in shape and situated in parallel arrangement to the needle-beam, and hung to rock, when required, on the shaft of the needle-beam, with a spring, *f*, in the rear, that serves to keep down, when not purposely raised to relieve the pad or foot *g* from pressure on the cloth, the front end of said pad-lever and its foot with an elastic force on the cloth which lies on the table E; but such pressure-pad arrangement and action may be varied at pleasure.

The cloth *h* is fed in one of two directions across the table E under the reciprocating needle *a*—that is, from right to left, or vice versa, as circumstances and the character of stitch, as hereinafter explained, require.

The toothed or roughened cloth-feeding bar F is shown to bite and release from below through the table on the cloth to effect the feed at intervals of the cloth, as well understood in sewing-machines, said bar having first a rising and forward motion to bite on the cloth and feed it a short distance on or across the table, and then a releasing or drop and spring-throw or back motion, which double action (though using the well-known devices for such a purpose) of cams or their equivalents and retracting-springs I effect in a novel manner, more particularly as regards the latter device and its action, and for a special purpose.

The cams *i i'*, which actuate the feed, are shown as occupying a vertical position and operated by, at its front, the main shaft *j* of the driving-wheel B. These cams act in concert with bars G G', geared together to secure a united cross-stroke, and provided, either bar, with a leg, *k k'*, against either of which, according to the set given, to govern the direction of feed. The bars G G' are hung to admit of a sliding or reciprocating motion in direction of the feed. Connected with the one, G, of these bars is a frame, *l*, pivoted to it in the rear by a pin, *m*, so as to admit of said frame moving backward and forward in the cross-stroke with the bars G G', but allowing, also, of a lifting and dropping motion by the alternate action and freedom from action on an arm, *i'*. This frame *l* carries the toothed feeding-bar F, and by the combined actions specified of the swinging frame *l*, cams *i i'*, and cross feeding-bars G G', governed, as hereinafter explained, by the retracting-spring H, are the forward back-stroke and up-and-down motion of the feed produced. Connected with the rear end of the other sliding cross-bar, G', is the retracting-spring H, which serves to throw back the feeding mechanism at the required time after the cam which actuates the feed ceases to urge and keep forward the feeding-bar. This spring is shown as entered at its one end in a slotted stud, *o*, projecting from the sliding cross-bar G', and connected at its other and lower end

with a forked piece or lever, I, hung on a pivot, *p*, and the arrangement is such as that accordingly as said forked piece I is rocked to throw or strain on the spring to the right or to the left (as the case may be) of a straight line intersecting the pivot of the forked lever and point of connection of the spring with the cross sliding bar is the force of the spring made to act on said bar *G'* to throw it and the feed mechanism with which said bar is geared to the right or to the left, and so make right or left the retracting line of action of the feed-works to put in gear either one of the two legs *k k'* of the cross sliding bars with the forward feeding-cam, *i*; and in this way may the direction of feed be reversed at pleasure without changing the direction in motion of the feed-driving cam or cams.

By giving the spring H a neutral position—*i. e.*, by turning the forked lever I so that said spring exercises no retracting force in either direction—the legs *k k'* on which the driving-cam operates, are not touched by the driving-cam *i* in its rotation, and the feed will be stopped. The action of the forked lever I thus to control or reverse the action of the retracting-spring T governs and changes at pleasure by simply causing the forks of said lever I to receive within them an eccentric disk-projection from or on a pivoted hand-lever or handle, J; that, on being thrown over to the right or to the left, or midway, rocks and adjusts the forked lever to give to the spring its opposite retracting force or neutral character, as specified. The use of a simple mode of reversing the feed without changing the direction of the general driving motion will be presently seen, or at least an important use for such a provision developed in a portion of the description succeeding this.

Connected with the feeding mechanism is an arm, *q*, and lever *r*. This lever and arm are for the purpose of stopping the feed in its back throw or stroke at any required point or distance of travel, and thereby regulating the amount of feed each forward stroke, which, of course, determines the length of stitch. The arm *q* is connected in the manner of a mere projection from the one sliding bar, *G*, and the lever *r*, which hangs on a fulcrum, *s*, intermediate of its length, is also connected at its upper end with said bar or the frame moving with it. Thus hung and connected it will be evident the feed or lower ends of the bar *q* and lever *r* will always move in reverse directions when the feed is at work, so that in whichever direction the feed is set going either the bar or lever will in the retracting action of the spring be thrown outward at its lower end, and, by providing an adjustable stop for said lower end of the arm *q* or lever *r* to come in contact with said arm or lever, (according to the direction of feed,) will serve to arrest the throw or stroke of the feeding mechanism at any required point or distance to suit a required length of stitch.

The adjustable stop which I have here shown

for the bar or lever to operate in concert with to equalize the lengths of stitches in a given set and vary the lengths of stitch in a series of stitches is that of an eccentric disk projecting from or on a pivoted lever or handle, J, that accordingly as it is thrown over to the right or to the left, or midway, causes the eccentric disk to arrest sooner or later the arm or lever *q* or *r*, and so increase or diminish and make regular, when once set, the length of feed.

In connection with the reciprocating needle *a*, I employ a peculiarly constructed and arranged double-hooked discoidal shuttle or thread-case, K, that has its bearing and rotates in and is guided by an open grooved frame, L, embracing its periphery. This double-hooked shuttle is shown as driven by the main shaft *j*, though in a manner disconnected from it, which may be effected by setting said shuttle inclined relatively to the axis of the shaft, as shown in Fig. 1, and driving the disk by pins *t t'*, which project from a face-plate, M, fast to the shaft, so as to rotate in a path crossing the axis of the shaft at right angles. By this means the driving-pins *t t'* will, during the rotation of the shaft, be made alternately to mesh with the shuttle by suitable openings therein, and alternately to break connection with the looper, yet keeping up a continuous rotary motion of the latter. The object of the driving-pins thus alternately breaking connection with the looper (and the driving-pins are relatively arranged to meet this requirement) is to admit of the needle-thread loop taken by each hook *u u'* to pass clean over or round the looper in the rotation of the latter.

In the body of the discoidal looper I arrange a bobbin or reel, N, carrying a secondary thread, *v*, said bobbin being hung, as regards tension and free rotation, in any suitable manner, so as to permit of the thread being drawn from it out onto and over the face of the discoidal looper by the action of the needle-thread or needle-thread loops thereon, as will hereinafter appear. This reel N, I prefer to make detachable at pleasure from the looper.

The needle-thread is shown as passing through the eye of a take-up lever, P, which is actuated by cam on the main shaft from the rear; but as the take-up action may be effected by properly and relatively pitching the motions of the needle and looper, and as separate take-up devices are common, I shall not further refer to such here, besides stating that the same may be advantageously dispensed with.

By this my improvement, which I have now described in general and in detail, I am enabled to effect varied and important changes in the action of sewing-machines. Thus, supposing the feed of the cloth to be in direction of the arrow *x* in Fig. 4, the needle having descended and carried the needle-thread through the cloth and commenced to retract, the one hook, *u*, of the looper catches the loop from

the eye of the needle, and as the looper continues to rotate said loop is drawn, spread, or opened, and held distended by embracing the body of the looper on either side and below, when, the needle having again descended and passed through the cloth at a point (by reason of the feed) to the right of the former puncture, and again commenced to retract, a second loop is caught from the eye of the needle by the other hook, *u'*, and by the former loop, which is then passed off the shuttle in the rear of it, taking along with it the secondary or binding thread, and drawn tight, whereby it will be seen one form of stitch is produced—to wit, a chain-stitch or series of chain-stitches, interlaced by a secondary or binding thread, as shown in Fig. 6; or, supposing the reel or bobbin *N* to be removed, then the well-known tambour or common chain-stitch only would be produced; or by reversing the direction of feed by the means I have before specified, or by other suitable means, so that the cloth moves in direction of the arrow *Z* in Fig. 5, then each fresh loop from the eye of the needle being taken by either one hook of the double-hooked shuttle or thread-case in advance, as it were, relatively, of the two loops to the travel of said hook, the former loop, taking the binding-thread along with it, will be passed off the shuttle on the rear of its motion without having received through it the second or succeeding loop, whereby is produced what is known as the "lock-stitch."

Having thus described sufficiently in detail a sewing-machine constructed according to my improvements, I would here observe, by way of further elucidation of one portion of my invention, that said improvement consists in something more than the mere production of any of the within-mentioned particular kinds of stitches, as, while in previous machine-sewing the well-known double-thread lock and single-thread "tambour-stitches" have been produced automatically, or without the aid of the hand, other descriptions of stitching have in various kinds of fancy and other work been made either wholly or in part by hand, and it is immaterial or irrelevant to my present improvement whether the other or interlaced chain-stitch herein described has or has not before been produced wholly by hand, or in part by machinery and in part by hand by, in illustration of the latter method, depending upon the action of the hand to pass each succeeding needle-thread loop through the next preceding one after the binding-

thread has been interlaced with the latter by, for instance, a peculiar and timely hand-feed of the cloth carrying the loops, and which hand-feed, though acting in concert with machinery to aid in the interlacing and interlocking of the loops, would virtually go to form a mere hand production of the stitch or hand-threading of the loops with a binding-thread interlacing them, as in case of the hand stopping to feed the cloth, or failing to feed it in a proper direction and at a proper time relatively to the action of the mechanical devices acting in concert, no such stitch or series of stitches would or could be produced. This, however, is not so with the combination of parts or devices herein shown and described, and by them I am enabled to produce automatically and entirely by the aid of machinery an interlaced chain-stitch, or by a certain construction of parts either of the three before-mentioned stitches at pleasure, and with that exactness and uniformity which distinguishes machine from other sewing. I therefore do not claim the mere production of any particular stitch or series of stitches, nor the use therefor of, in combination, merely a rotary hook, needle, and bobbin, which three devices, acting in concert, are common to the Wheeler & Wilson and other machines; but

What I do claim is—

1. The mechanical production of the interlaced chain-stitch in an organized sewing-machine by the combination, with the reciprocating eye-pointed needle and discoidal thread-case or rotary hook and bobbin, or their equivalents, of the herein-described automatic feeding mechanism to the cloth, when so arranged in relation to and operating in concert with the said devices as to cause each loop taken from the needle to be carried by the hook through the preceding loop, substantially in the manner described.

2. The combination and arrangement, substantially as described, of the eye-pointed needle, discoidal, thread-case, provided with two loop-taking hooks, with an automatic feed mechanism operating in the manner set forth, so that a mere change in the direction of the feed shall effect the difference described between the several stitches.

In witness whereof I have hereunto subscribed my name.

JAMES E. A. GIBBS.

Witnesses:

S. H. MAYNARD,  
THOMAS DUCEY.