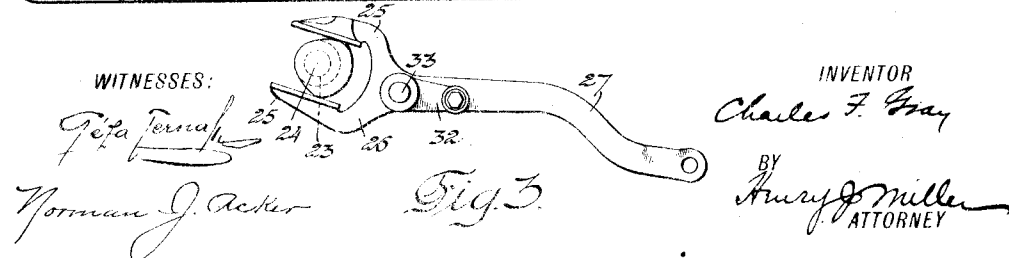
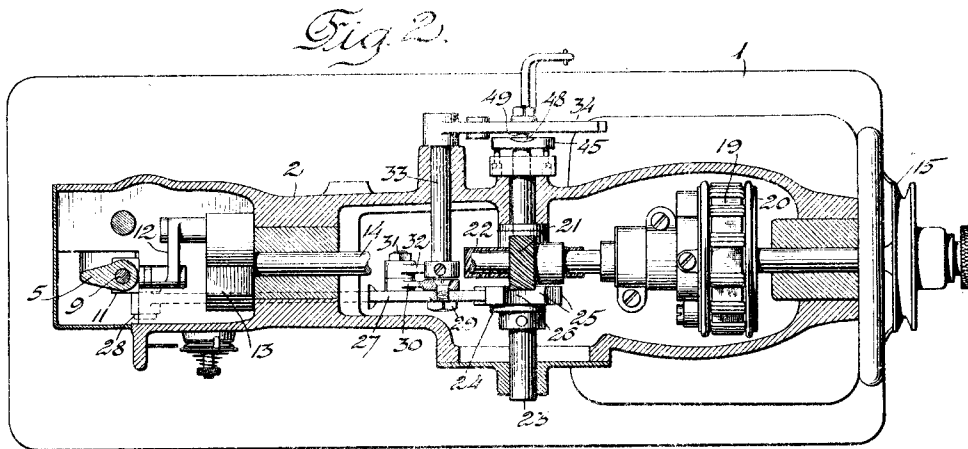
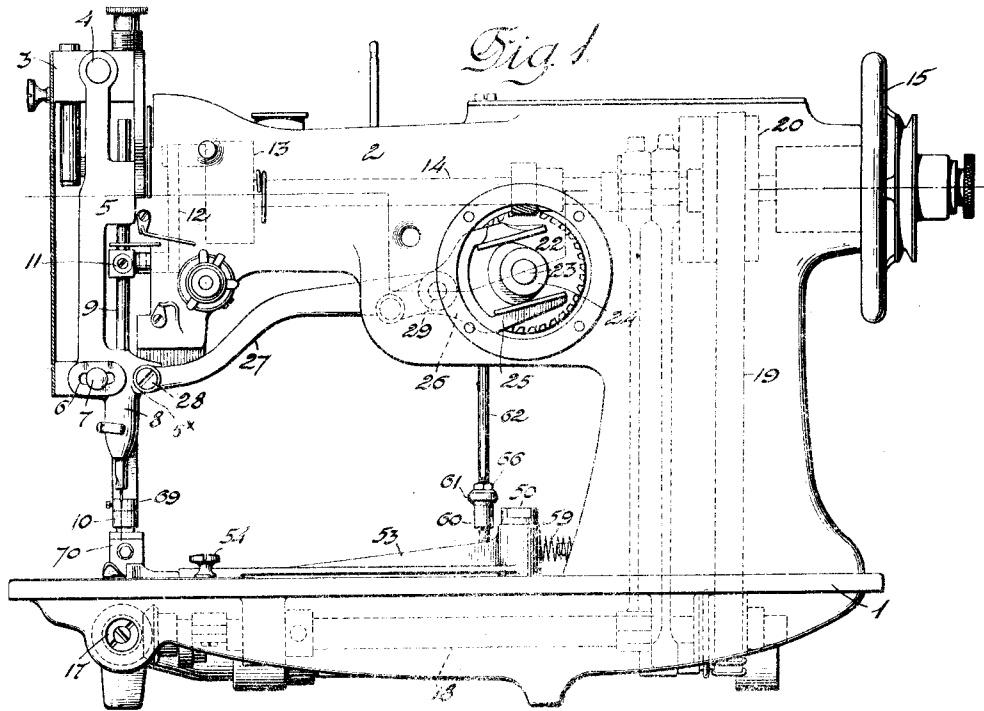


C. F. GRAY.
OVERSEAMING SEWING MACHINE.
APPLICATION FILED JUNE 11, 1909.

1,050,359.

Patented Jan. 14, 1913.

2 SHEETS-SHEET 1.

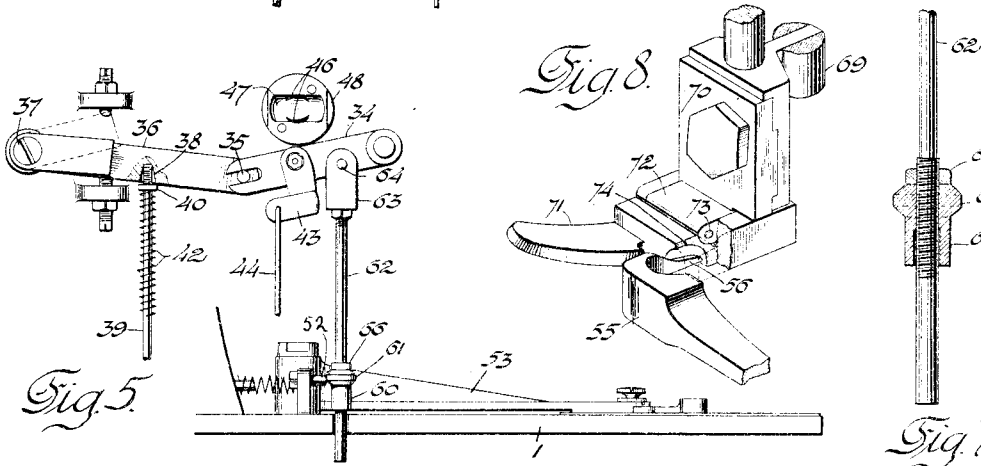
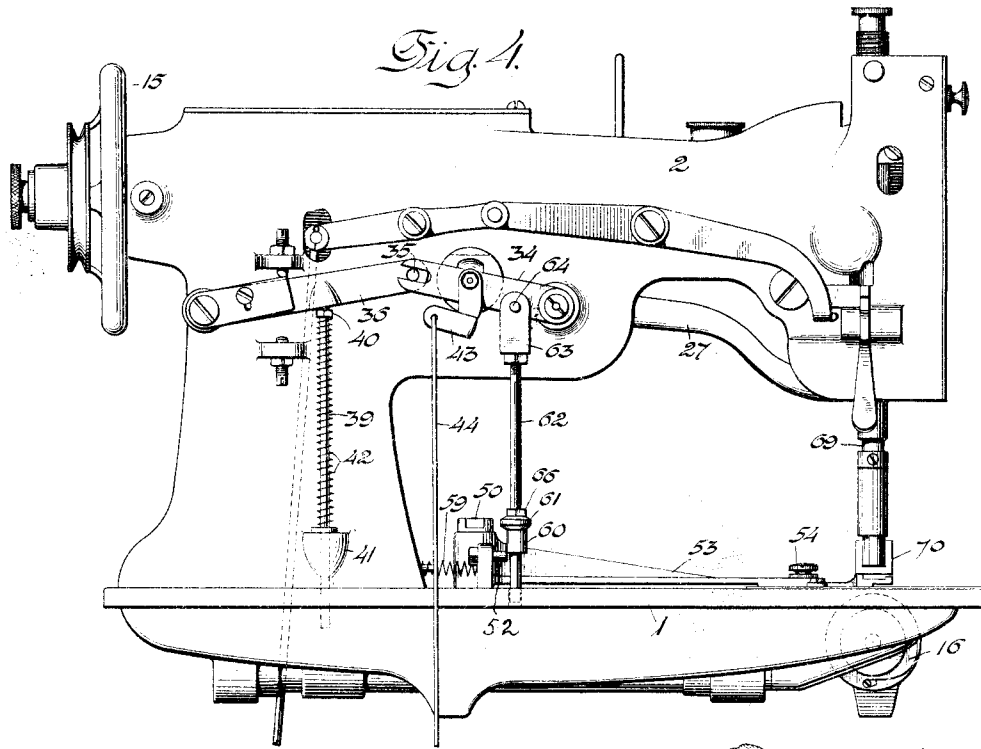


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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OVERSEAMING SEWING-MACHINE.

1,050,359.

Specification of Letters Patent.

Patented Jan. 14, 1918.

Application filed June 11, 1909. Serial No. 501,455.

To all whom it may concern:

It is known that I, CHARLES F. GRAY, a citizen of the United States, residing at Sierra Madre, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Overseaming Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to an improvement in overseaming sewing machines, and particularly to machines for producing a continuous seam composed of sections of straight-away and zigzag stitching, such as is commonly employed in closing shoe up-
15 pers, stitching "patch pockets" to garments and performing various operations upon overalls and certain other articles of clothing.

20 In seams consisting of combined straight-away and zigzag portions, it is desirable to vary the degree of tightness of the stitches to enable the material at the more loosely stitched zigzag portion to be opened out
25 flat. The object of the present invention is to facilitate this and also to facilitate the making of a zigzag seam composed of stitches of different degrees of tightness where desired at different parts.

30 The invention consists essentially in a stitch-finger adapted for introduction within the range of action of the stitch-forming mechanism for receiving and supporting the overseam stitches, and means operable
35 while the machine is in motion for throwing said stitch-finger into or out of such operative position; and it includes, more specifically, an operative connection between such stitch-finger and the jog-control-
40 ling device of a jogging-needle machine whereby the stitch-receiving finger is normally withdrawn from operative relation with the stitch-forming devices, but may be shifted into operative relation therewith, so
45 as to receive the stitches subsequently drawn off the same by the feeding mechanism when zigzag or overseam stitching is produced.

50 The present improvement is adapted for embodiment in various types of overseaming machines, but especially in machines including a reciprocatory and laterally jog-

ging needle; and it is shown in the accompanying drawings applied to a Singer No. 107-W-2 machine forming the subject of my Patent No. 933,032, dated August 31, 1909.

While the present invention is not directed specifically to general constructive features of the machine as regards the mechanism for producing and changing the character of the stitches, it is in the present embodiment so related to this mechanism that a description and illustration of the entire machine will be found useful in setting forth the present improvement.

In the accompanying drawings, Figure 1 is a front side elevation of a machine embodying the present improvements, and Fig. 2 a sectional plan view of the same taken partly through the axis of the main-shaft and partly through that of the cam-shaft and controlling rock-shaft. Fig. 3 is a detail elevation of the needle jogging devices. Fig. 4 is a rear side elevation of the machine and Fig. 5 a similar elevation showing the jog-controlling mechanism in a different position. Fig. 6 is a plan of the elbow-lever carrying the stitch-finger with certain of the cooperating parts of the machine. Fig. 7 is an elevation of the lower portion of the cam-rod and the cam for controlling the position of the stitch-finger. Fig. 8 is a perspective view of the presser-foot, with a portion of the same broken out to expose the stitch-finger, which is represented in operative relation therewith.

The machine is constructed with the usual bed-plate 1 with overhanging bracket-arm 2 upon the head 3 of which is disposed the horizontal fulcrum-stud 4 upon which is journaled the swinging needle-bar frame 5 provided in its lower portion with a transverse slot 6 to receive the headed guide-stud 7 upon the lower member of the head 3 of the bracket-arm.

In the lateral bearing members 8 of the needle-bar frame 5 is journaled the vertically reciprocating needle-bar 9 carrying the needle 10 and provided with the fixed collar 11 carrying a stud embraced by one end of the pitman 12 whose opposite end embraces a crank-pin upon the crank-plate 13 fixed upon the forward end of the main-shaft 14

which is journaled as usual in the bracket-arm and provided at its rearward end with the balance-wheel 15.

The needle 10 coöperates with the rotary lock-stitch hook 16 mounted upon the transverse shaft 17 connected by suitable gearing with the longitudinal shaft 18 mounted beneath the bed and driven by means of the belt 19 and sprocket-wheels 20 from the main-shaft 14.

Upon the main-shaft 14 is fixed the angular gear-wheel 21 meshing with the larger angular gear 22 fixed upon the transverse cam-shaft 23 which is thus rotated at one-half the speed of the main-shaft. The cam-shaft carries the so-called "triangular" cam 24 which is embraced by the parallel members 25 of a yoke 26 formed at the forward end of a link-bar 27 pivotally connected at its rearward end by means of the screw-pin 28 with a lug 5* upon the needle-frame 5.

As will be observed, the link-bar 27 receives vibratory movements upon its pivotal connection 28 from the actuating cam 24, but is free to move endwise in relation to said cam. In order that the sidewise actuation imparted by the cam may be partially converted into endwise movement, the link-bar is provided adjacent its yoke 26 with a controlling stud 29 which is provided with suitable guiding means for determining its path of movement.

As herein shown, the guiding means comprises the swinging link 30, one end of which embraces the controlling stud 29 of the link-bar 27 and the other end embraces a fulcrum-stud 31 carried by a lateral arm 32 fixed upon the transverse rock-shaft 33 journaled in the rearward side of the bracket-arm parallel with the cam-shaft 23. The rock-shaft 33 is disposed slightly below and forwardly of the cam-shaft 23, and in such position that its axis is at substantially the same level, and preferably coincident with that of the controlling stud 29 when the link-bar 27 is in its extreme lower position.

The controlling rock-shaft 33 has fixed upon its rearward end the lateral crank-arm 34 forked at its outer end to embrace a pin 35 upon the forward end of a lever 36 fulcrumed upon the fixed stud 37 upon the bracket-arm and formed in its lower side with a socket 38 entered by the upper threaded end of a push-rod 39 provided with a thrust-nut 40 between which and the guiding boss 41 of the bracket-arm is interposed a spring 42 by means of which the arm 36, and consequently the arm 34, is yieldingly maintained in raised position. The crank-arm 34 is provided with a lug 43 having an eye in which is hooked the upper end of the treadle-rod 44, adapted for drawing such arm downwardly to rock the shaft 33 in opposition to the spring 42. When

the arm 34 is in its normal or upper position, as represented in Fig. 4, the fulcrum-stud 31 for the swinging link 30 is disposed upon an imaginary line joining the centers of the shaft 23 and pivotal screw-pin 28, so that the vibration of the link-bar 27 carries the controlling stud 29 across such line at substantially right angles, and hence it receives no endwise motion through the guiding link 30; but when the arm 34 is drawn downwardly into the position represented in Fig. 5, the rocking of the shaft 33 carries the fulcrum-stud 31 above such imaginary line, whereby the link 30 is caused to swing across said line obliquely, thus producing an endwise movement of the link-bar 27 in addition to its uniform sidewise movement, this endwise movement being communicated to the swinging needle-frame 5 and producing jogging movements of the needle in conjunction with its reciprocating movements.

As shown more in detail in my Patent No. 933,032, before mentioned, the rearward end of the cam-shaft 23 carries an axially yielding cam-disk 45 having in its rearward face a diametrical groove or recess with abrupt side walls to form stop-shoulders 46 and with laterally and outwardly inclined ends 47 convergent with the beveled edge portions 48 of the cam-disk whose outer periphery is otherwise cylindrical so as to afford externally of said recess segmental stop-shoulders circularly coextensive with the shoulders 46. The lever arm 34 carries upon its front face a stud 49 which, in the normal elevated position of the arm 34 represented in Fig. 4, is disposed substantially concentric with the cam-disk 45, and extends within the transverse groove or recess therein. The cam-disk 45 is so set upon the shaft 23 in relation to the actuating cam 24 that when the yoke 26 first reaches the limit of its extreme upper or lower throw, and the needle is rising and its point is a little above the work, the cam-groove is substantially vertical so as to permit the descent of the locking stud 49 from normal concentric position with the crank-arm 34; but as the cam-shaft continues to rotate and the needle rises to its highest position, the cam-groove is brought into varying angular relations with the circular path of movement of the stud 49 upon the crank-arm 34 and serves to restrain the movement of the latter by one of its segmental stop-shoulders 46 until the cam-disk has made substantially a semi-rotation and the transverse cam-groove again assumes a substantially vertical position as the yoke 26 attains its opposite extreme position, and the point of the needle is again above the work and rising to extreme elevated position, when the stud 49 is again free to move downwardly with its supporting arm 34 in shifting the fulcrum-stud 31

for effecting the change between straight-away and zigzag stitching conditions. When the yielding cam-disk 45 is in releasing position as indicated in Fig. 4, the drawing down of the lever-arm 34 causes the stud 49 in its descent to engage the inclined end portion 47 of the cam-groove, thereby causing the thrusting aside of the yielding cam-disk, but the continued descent of the stud 49 past the transverse cam-rib afforded by the convergently beveled cam-portions 47 and 48 permits the cam to return under the action of its spring into its normal position, the stop-shoulder afforded by the angular edge of the cam-disk locking the stud 49 in its lower position and preventing the return of the arm 34 to initial straight-away stitching position until the treadle-rod 44 is released by the operator and one of the external bevels 48 is presented to the stud 49, when the crank-arm 34 rises to initial straight-away stitching position under the action of the spring 42.

Upon the bed-plate of the machine beneath the bracket-arm is pivotally mounted by means of the fulcrum-screw 50, a two-armed bell-crank or elbow-lever having a shorter lateral arm 51 carrying a lateral stud 52, and a longer longitudinally extending arm 53 upon the bottom of the forward extremity of which is secured by means of the fastening screw 54 the shank 55 of a stitch-receiving finger 56 normally disposed slightly in advance of the center of the transverse needle-slot 57 of the throat-plate 58, but adapted to assume operative relation crosswise of the needle-slot when its carrying lever 51 53 is shifted. The lever-arm 51 is normally maintained in its forward position, that of inaction of the stitch-finger 56, by means of a spring 59 interposed between the same and the base of the bracket-arm 2, with the end of the stud 52 in contact with the depending boss 60 of a double-conical cam-piece 61 fixed upon the vertical cam-rod 62 whose forked head 63 embraces and is secured by means of the pivotal pin 64 to the rocking arm 34. When the arm 34 is in its upper or straight-away stitching position, the stud 52 rests against the boss 60 of the cam-sleeve, and the stitch-finger 56 is in retracted or inoperative position, but when the arm 34 descends, it depresses the push-rod, which carries with it the conical cam-portion 61 acting upon the stud 52 to shift the lever 51 53 to throw the stitch-finger in operative position across the needle-slot as indicated in Figs. 5 and 6, whereby the descent of the needle alternately upon opposite sides of the same causes the production of overseam or jog stitches across it which are subsequently drawn off its point by the action of the feed-dog 65 in a well-known manner.

The upper portion of the cam-rod 62 is

reduced and the lower part adjacent such reduced portion is screw-threaded to receive the correspondingly threaded cam-member 60 61, which is thus made adjustable thereon to conform with the adjustment of the needle-jog controlling mechanism for different widths of overseam. A jam-nut 66 is applied to the threaded portion of the rod 62 to lock the cam-member in the desired position of adjustment.

As will be seen by reference more particularly to Fig. 8, the stitch-finger 56 is of taper form from base to point, whereby the adjustment of its advance position determines its effect upon the stitches formed over the same. In conjunction with the previously described adjustment of the cam-member 60 61, a stop-plate 67 is secured upon the bed-plate 1 by means of the fastening screws 68, the stop-plate affording a shoulder for positively arresting the forward end of the lever-arm 53 when acted upon by the cam-member 61. The stop-plate has the usual slotted apertures to receive the fastening screws 68, which afford the required adjustment of the same.

The presser-foot is mounted upon the usual spring-pressed presser-bar 69 and is provided with a shank portion 70 and a foot-plate 71 channeled in its upper side and pivotally connected with a forward extension 72 of the shank-portion by means of a pivotal pin 73. The foot-plate is notched at the inner side of its forward portion for clearance for the stitch-finger, and has formed in its lower side in alinement with the latter a groove 74 into which the operative portion of the stitch-finger 56 projects and between which parts a suitable clearance space is provided to permit the easy release of the overseam stitches as the work is fed forwardly beneath the presser-foot by the feeding mechanism.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a sewing machine, the combination with overseaming stitch-forming mechanism, of a stitch-receiving finger adapted for movement between extreme positions respectively within and out of the range of action of the stitch-forming mechanism, spring-actuated means for maintaining said finger continuously in one of said extreme positions in the production of a succession of stitches, and manually controlled means acting in opposition to said spring for shifting said finger into the other extreme position.

2. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, and a work-support, of slack-producing means adapted to engage the needle-thread adjacent the work-support for insuring the production of loose stitches in the work, means for normally retaining the slack-producing means out of operative

relation with the stitch-forming mechanism during the production of a succession of stitches, and manually controlled means including an element extending below the work-support for establishing operative relation between the slack-producing means and the stitch-forming mechanism.

3. In a sewing machine, the combination with the frame comprising a work-supporting member and an over-hanging bracket-arm, and stitch-forming mechanism including a reciprocating needle, of slack-producing means adapted to engage the needle-thread adjacent the work-supporting member for insuring the production of loose stitches in the work, said slack-producing means being adapted to be shifted into and out of operative relation with the stitch-forming mechanism, and manually controlled means comprising a lever fulcrumed upon the bracket-arm and operatively connected with the slack-producing means for controlling the position of the latter relatively to the stitch-forming mechanism.

4. In a sewing machine, the combination with stitch-forming mechanism adapted for production of straight-away and zigzag stitching, and controlling means for changing the action of the stitch-forming mechanism from one to the other kind of stitch production, of a stitch-receiving finger movable into and out of operative position within the range of action of the stitch-forming mechanism and adapted to receive and support the zigzag stitches, and means for moving said stitch-receiving finger into and out of operative position timed correspondingly with changes of the stitch-forming mechanism to and from zigzag-stitch producing condition.

5. In a sewing machine, the combination with stitch-forming mechanism comprising a reciprocating and laterally jogging needle and a cooperating loop-taker, and actuating means for imparting reciprocating movements to said needle and operative movements to said loop-taker, needle-jogging means, and controlling means whereby said needle-jogging means may be thrown into and out of effective operation, of a stitch-receiving finger adapted for introduction into operative position in the range of lateral movement of said needle, and means connected with the jog-controlling means for shifting said finger into and out of operative position.

6. In a sewing machine, the combination with stitch-forming mechanism comprising a reciprocating needle, a cooperating loop-take, and actuating means for imparting reciprocating movements to said needle and operative movements to said loop-taker, means for imparting jogging movements to said needle, and controlling means whereby said jogging means may be thrown into and

out of effective operation, of a stitch-receiving finger adapted for introduction between the needle-paths during needle-jogging operations, and means connected with the jog-controlling means for moving said finger into operative position when the jogging means become operative.

7. In a sewing machine, the combination with a throat-plate formed with a needle aperture, and stitch-forming mechanism comprising a reciprocating needle adapted to enter said needle aperture in the throat-plate, a cooperating loop-taker, and actuating means for imparting reciprocating movements to said needle and operative movements to said loop-taker, normally inoperative means for imparting jogging movements to said needle, and controlling means whereby said jogging means may be thrown into operation, of a taper stitch-receiving finger adapted for introduction across said needle-aperture in the throat-plate between the needle-paths during needle-jogging operations, and means adjustably connected with the jog-controlling means for moving said finger into operative position when the jogging means become operative.

8. In a sewing machine, the combination with stitch-forming mechanism comprising a reciprocating needle, a cooperating loop-taker, and actuating means for said needle and loop-taker, of a laterally movable needle-frame, normally inoperative means for imparting jogging movements to said needle-frame, controlling means including a vibrating arm for throwing said jogging means into operation, a stitch-receiving finger adapted for introduction between the needle-paths during needle jogging operations, a carrying lever for said stitch-receiving finger mounted upon a fixed fulcrum, a reciprocating cam-rod operatively connected with said vibrating arm of the jog-controlling means, and a cam member mounted upon said cam-rod and adapted to engage said carrying lever to throw the stitch-receiving finger into operative relation with the stitch-forming mechanism.

9. In a sewing machine, the combination with stitch-forming mechanism comprising a reciprocating needle, a cooperating loop-taker, and actuating means for said needle and loop-taker, of a laterally movable needle-frame, normally inoperative means for imparting jogging movements to said needle-frame, controlling means including a vibrating arm for throwing said jogging means into operation, a stitch-receiving finger adapted for introduction between the needle-paths during needle-jogging operations, a carrying lever for said stitch-receiving finger mounted upon a fixed fulcrum, a reciprocating cam-rod pivotally connected to said vibrating arm, and a cam-

member adjustably mounted upon said cam-rod and adapted to engage said carrying lever to throw the stitch-receiving finger into operative relation with the stitch-forming mechanism.

10. In a sewing machine, the combination with stitch-forming mechanism comprising a reciprocating needle, a cooperating loop-taker, and actuating means for said needle and loop-taker, of a laterally movable needle-frame, an endwise movable link-bar pivotally connected at one end with the needle-frame, means for imparting to said link-bar uniform swinging movements of which one in each direction is effected for every complete reciprocation of the needle, guiding means to determine the direction of movement of said link-bar under the action of its swinging means, a controlling rock-shaft by which said guiding means are carried, an arm fixed upon said rock-shaft and

provided with means for moving it, a stitch-receiving finger adapted for introduction between the needle-paths during needle jogging operations, a two-armed carrying lever having a fixed fulcrum at the junction of its arms and having fixed to one of said arms said stitch-receiving finger, a reciprocating cam-rod pivotally connected to the arm of said rock-shaft, a cam-member fixed upon said cam-rod and adapted to engage the second arm of said carrying lever, and a spring for maintaining said lever-arm normally in the path of movement of said cam-member.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES FREDERICK GRAY.

Witnesses:

S. H. SPAFFORD,
A. S. MEAD.