

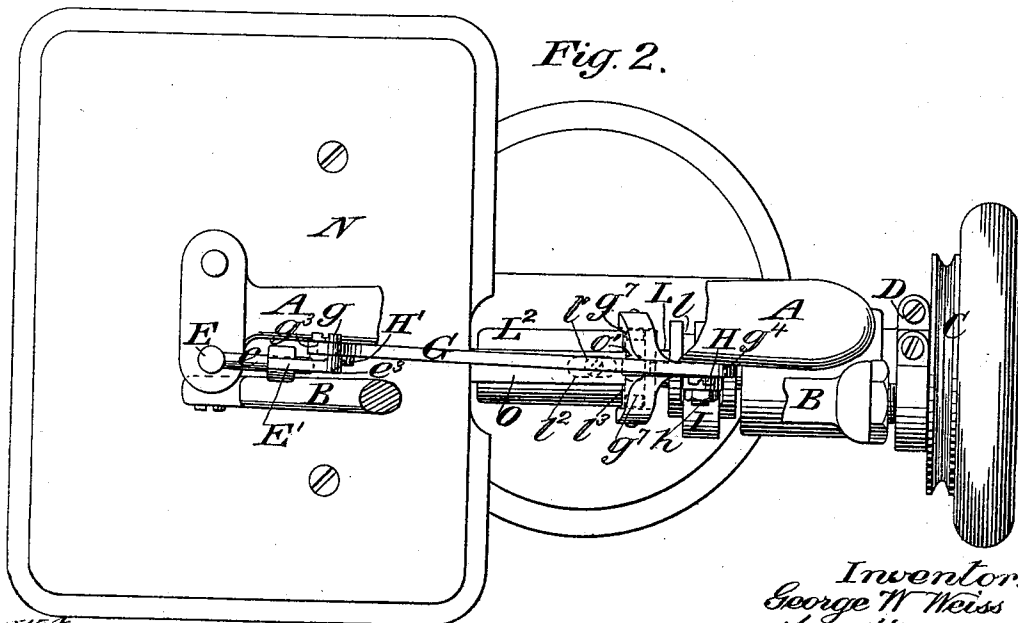
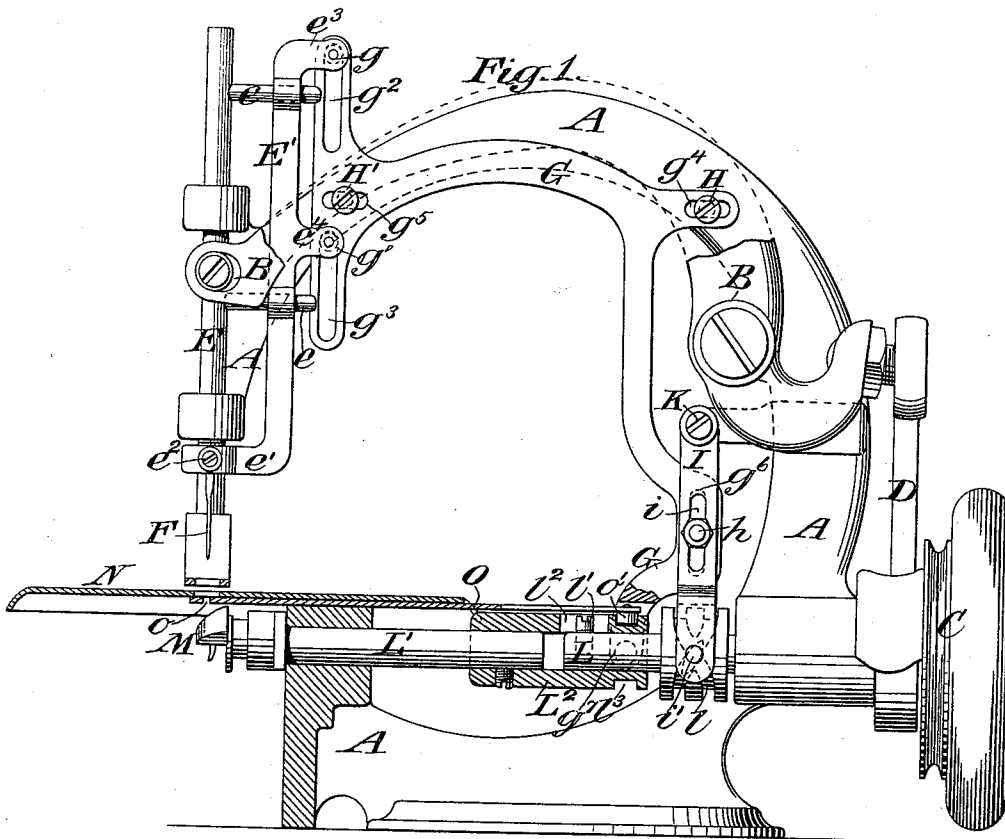
(No Model.)

2 Sheets—Sheet 1.

G. W. WEISS.
SEWING MACHINE.

No. 552,216.

Patented Dec. 31, 1895.



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Inventor:
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

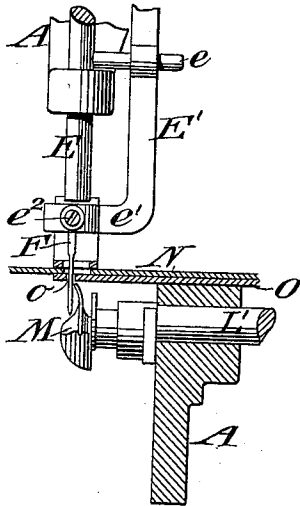


Fig. 4.

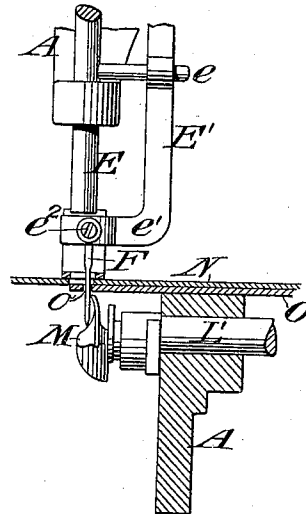


Fig. 5.

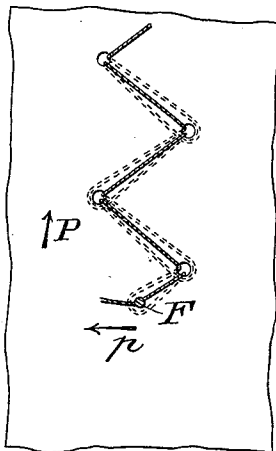


Fig. 6.

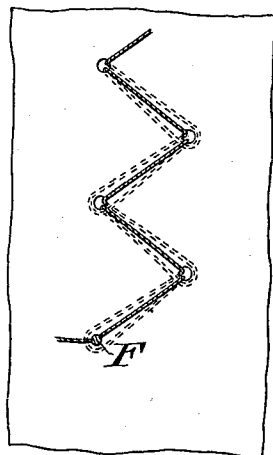
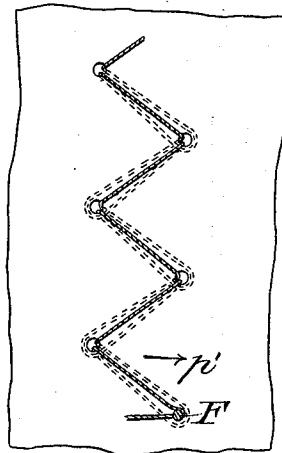


Fig. 7.



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UNITED STATES PATENT OFFICE.

GEORGE W. WEISS, OF BROOKLYN, ASSIGNOR TO JOHN STEWART, OF
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SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 552,216, dated December 31, 1895.

Application filed January 16, 1893. Serial No. 458,556. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. WEISS, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful
5 Improvement in Zigzag-Stitch Sewing-Machines, of which the following is a specification.

My invention relates to an improvement in zigzag-stitch sewing-machines in which the
10 needle is carried bodily back and forth across the path of the goods to be operated upon.

My invention contemplates a construction which may be readily attached to a type or
types of sewing-machines now in general use—
15 such, for example, as the Willcox & Gibbs machine—and provides for the movement of a guide-plate and the looper to correspond with the lateral movement of the needle.

A practical embodiment of my invention is
20 represented in the accompanying drawings, in which—

Figure 1 is a view of a machine in side elevation, partly in section, showing the needle
at the middle of its lateral movement. Fig. 2
25 is a top plan view. Fig. 3 is a view in detail, showing the needle at the limit of its outward lateral movement. Fig. 4 is a view in detail, showing the needle at the limit of its inward lateral movement; and Figs. 5, 6, and 7 represent
30 the conditions of the stitch at the steps when the needle occupies the positions shown in Figs. 1, 3, and 4, respectively.

I have shown the zigzag-stitch-forming mechanism in the accompanying drawings in
35 connection with the frame and operating mechanism of an ordinary Willcox & Gibbs sewing-machine. The frame is denoted by A, the vibrating arm by B, the pulley for operating the looper-shaft and vibrating arm by
40 C, and the connecting-rod for transmitting motion to the vibrating arm by D.

The vertically-reciprocating needle-bar E, which receives its motion from the end of the
vibrating arm B, is provided with a pair of
45 laterally-extending pins or studs e for supporting the auxiliary needle-bar E'. The bar E' is provided with sockets for the reception of the pins e , so as to permit the bar E' to slide
50 laterally on the pins e , while at the same time it is reciprocated vertically, together with the needle-bar E. The lower end of the bar E' is

turned, as shown at e' , underneath the lower end of the needle bar E, and is there provided with a suitable socket and clamp-screw e^2 for securing the needle F to the bar E'. The bar
55 E' is provided with laterally-extending lugs e^3 and e^4 , through which guide-studs g g' extend into elongated slots g^2 g^3 , formed in the end of the reciprocating frame G. The frame G is secured to the frame A of the machine by means
60 of bearing-screws H H', which pass through elongated slots g^4 g^5 in the frame, and while preventing it from moving vertically permit it to move laterally on the bearing-screws H H'. The slots g^2 and g^3 in the frame G are
65 sufficiently long to allow for the vertically-reciprocating movement of the needle-bar. The downwardly-extending portion of the frame G is provided with an elongated slot g^6 , through
70 which a pivotal bolt h extends, the said bolt h extending at the same time through a slot i in the vibrating arm I, pivotally secured at its upper end, as at K, to a support on the
75 frame A and at its lower end engaged with a cam l on the rotary shaft L.

The arm I is provided at or near its lower end with an inwardly-extending stud i' adapted to engage the grooves in the cam l and vibrate the arm I as the shaft L is rotated by
80 the pulley C.

The connection between the arm I and the frame G is such that, as the arm I is vibrated the frame G, and hence the needle-bar E and needle F, will be moved back and forth in a
85 direction lateral with respect to the vertically-reciprocating movement of the needle. The action of the cam l upon the arm I is so timed with respect to the vertically-reciprocating movement of the needle that the needle will
90 be moved laterally while it is at or near the limit of its upward stroke.

In order to adjust the looper M in position to take the loops properly from the needle when the needle is at the limits of its lateral movement, I provide for moving the looper
95 bodily along underneath the work-table N to correspond with the lateral movement of the needle above said table. This I accomplish by making that portion L' of the looper-shaft to which the looper M is attached separate
100 from the portion L of the looper-shaft to which the pulley C is secured and securing the parts

L and L' together, so that the latter will rotate with the former, but at the same time will be permitted a longitudinally-sliding movement independent of the former. To this end I fix a sleeve L² to the shaft-section L' and arrange the end of the shaft-section L in the sleeve L², so that the sleeve may slide on the shaft L and at the same time be forced to rotate therewith by setting a screw or pin l' in the shaft L and extending it within an elongated slot l² in the sleeve L². The sleeve L² is provided with an annular groove l³, and the lower end of the depending portion of the frame G is preferably bifurcated and its branches provided with studs g⁷, adapted to enter the annular groove l³ and, while permitting the sleeve to rotate freely, cause it and the shaft-section L' fixed to it to move longitudinally back and forth with the frame G. A movable guide-plate O is located beneath the work-table N and provided with a perforation o of sufficient size to permit the needle to pass therethrough without binding. The guide-plate O is caused to move in harmony with the lateral movements of the needle and looper by means of a stud o', attached to its inner end, which enters the groove l³ in the sleeve L², and while permitting the free rotary movement of the sleeve relatively to the plate serves to move the plate longitudinally together with the sleeve and the portion of the shaft carrying the looper. The movement of the guide-plate O will not interfere with the passage of the work over the table M, and at the same time it will form a guide for the needle and cause it to present the loop free from the fabric in position to be taken up properly by the looper.

The feed (not shown herein) may be of the ordinary structure commonly used in connection with machines of this class.

In operation, suppose the needle to be in the position shown in Fig. 1, midway of the stitch, the thread will occupy the position shown in the diagram, Fig. 5, the needle being represented by F and the loop drawn by the looper into the position shown in dotted lines beneath the position of the needle F. As the needle moves laterally to the extremity of its upward movement, then downwardly through the work into the position shown in Fig. 3, the thread will assume the position shown in diagram, Fig. 6. As the needle returns to the limit of its upper stroke and is again moved, together with the looper, laterally to the opposite extremity of its lateral movement, and then again inserted through the work into the position shown in Fig. 4, the thread will have been carried into the position shown in the diagram, Fig. 7, and an additional completed stitch will have been made. The zig-zag arrangement of the stitches is due to the combined movements of the work in the direction shown by the arrow P in Fig. 5 and the lateral movement of the needle and looper in the direction shown by the arrows p and p', Figs. 5 and 7.

In case it be desired to form a lock-stitch instead of a chain-stitch, the shuttle-carrier and shuttle, which for the purposes of my present invention may be considered a looper, may be reciprocated in a manner quite similar to that described in reference to the rotary hook-looper.

What I claim is—

1. A sewing machine comprising a vertically reciprocating needle bar, with means for operating it, and having laterally extending guides, an auxiliary needle bar movably supported on said lateral guides, a sliding frame provided with vertical guide ways, said auxiliary needle bar having projections engaging said guide-ways, a swinging arm pivoted to the frame of the machine and pivotally engaging the sliding frame, means for operating said swinging arm, and complementary stitch forming mechanism; substantially as described.

2. A sewing machine comprising a vertically reciprocating needle bar provided with laterally extending pins or studs, an auxiliary needle bar provided with sockets fitting over said pins, said auxiliary needle bar provided with lateral studs, a sliding frame as G provided with vertical slots g², g³ in which the lateral studs on the auxiliary needle bar work, a swinging arm pivoted to the framework of the machine and connected at its lower end with operating means on the main shaft, and having a pivotal connection with the sliding frame, and complementary stitch forming mechanism; substantially as described.

3. A sewing machine comprising a needle bar having the lateral extending lugs e, e, the auxiliary needle bar having the sockets for the reception of the lugs e, e and having studs g, g', the sliding frame G having elongated vertical slots g², g³ in which the studs g, g' extend, and having horizontal elongated slots g⁴, g⁵ and screws passing therethrough into the frame of the machine, a swinging arm I pivoted at one end to the frame of the machine and provided with an elongated vertical slot, a stud passing through said elongated vertical slot from the sliding frame G, a main shaft, a rotating cam on said main shaft, with connections between said cam and the swinging arm I, and complementary stitch forming mechanism; substantially as described.

4. The combination with a looper, suitable support therefor, a vibrating arm, means for operating it, and a needle bar attached to said vibrating arm, of an auxiliary needle bar supported upon the aforesaid needle bar and having a movement laterally with respect thereto, a sliding frame having a loose engagement with said auxiliary needle bar, a swinging arm engaged with said sliding frame and with a rotary cam for operating the sliding frame and hence the auxiliary needle bar, and connections between the sliding frame and the looper support whereby the latter is reciprocated, substantially as set forth.

5. The combination with the looper, a support to which said looper is attached, a vibrating arm, means for operating it, and a needle bar attached to said vibrating arm, of an auxiliary needle bar supported upon the aforesaid needle bar and having a movement laterally with respect thereto, a sliding frame having a loose engagement with said auxiliary needle bar, a swinging arm engaged with said sliding frame and with a rotary cam for operating

the sliding frame and hence the auxiliary needle bar, and a stud and sleeve connection between said sliding frame and the looper support whereby the latter is reciprocated; substantially as described.

GEORGE W. WEISS.

Witnesses:

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