

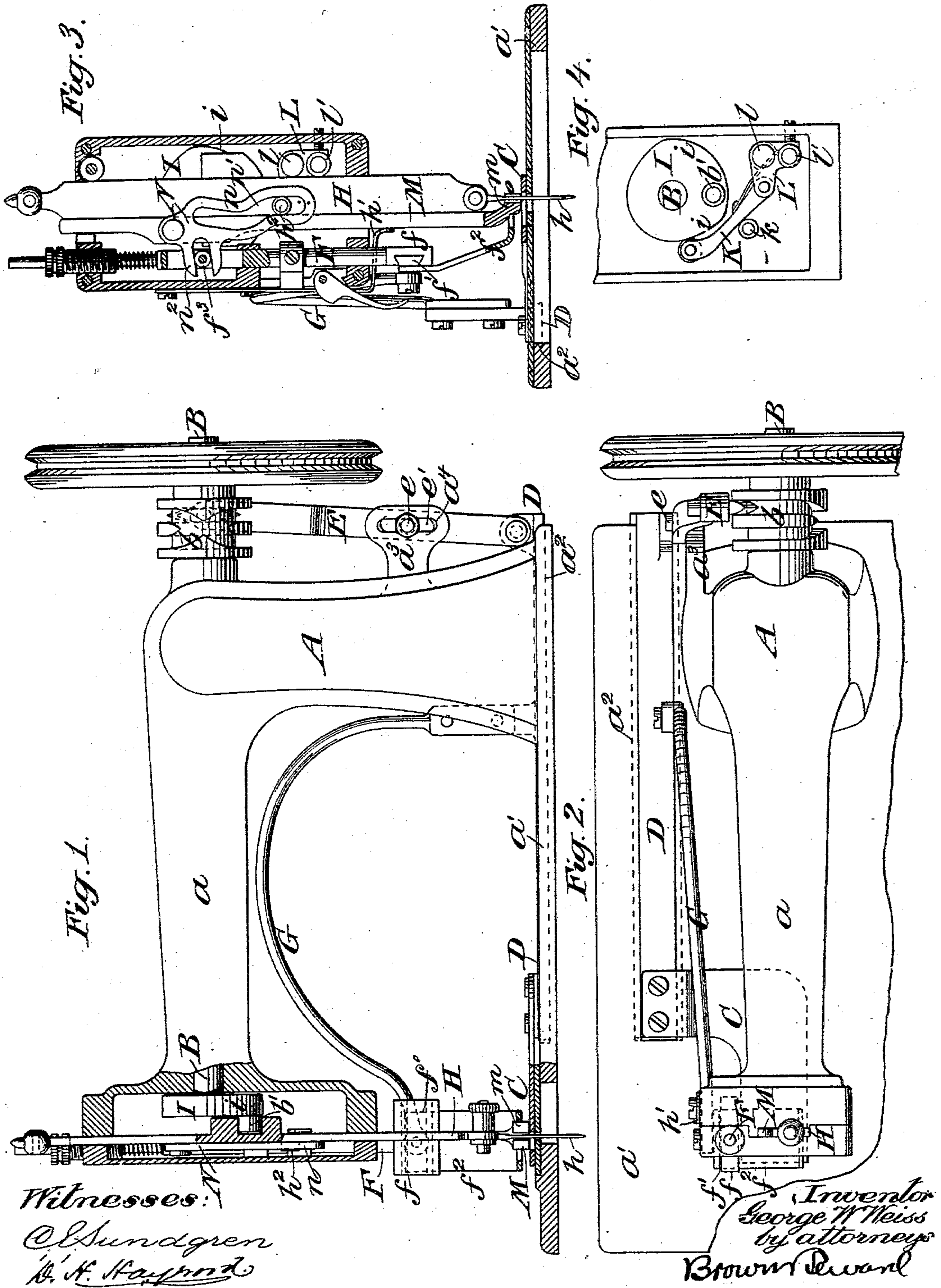
(No Model.)

2 Sheets—Sheet 1.

G. W. WEISS.
ZIGZAG STITCH SEWING MACHINE.

No. 552,941.

Patented Jan. 14, 1896.



(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

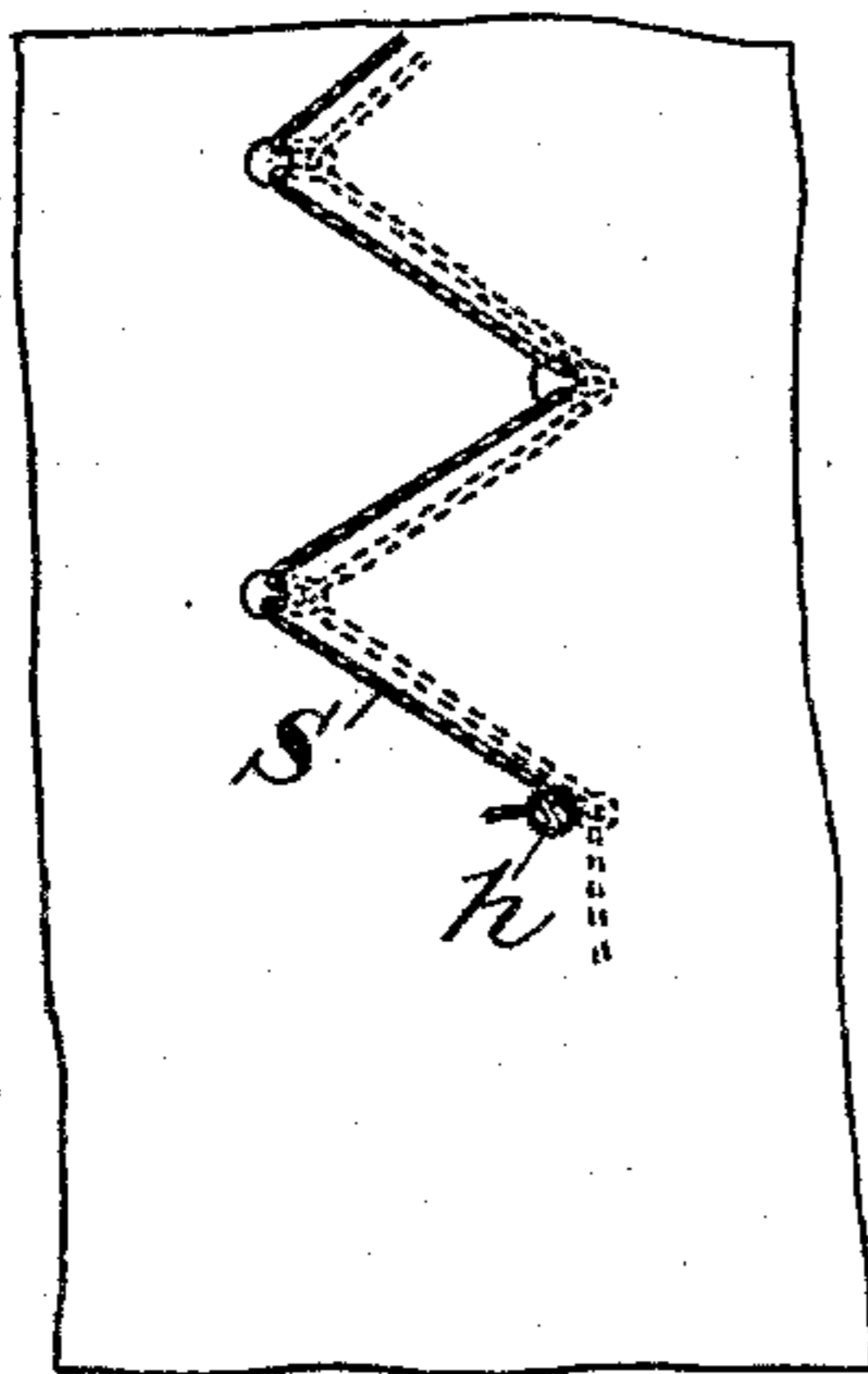


Fig. 6.

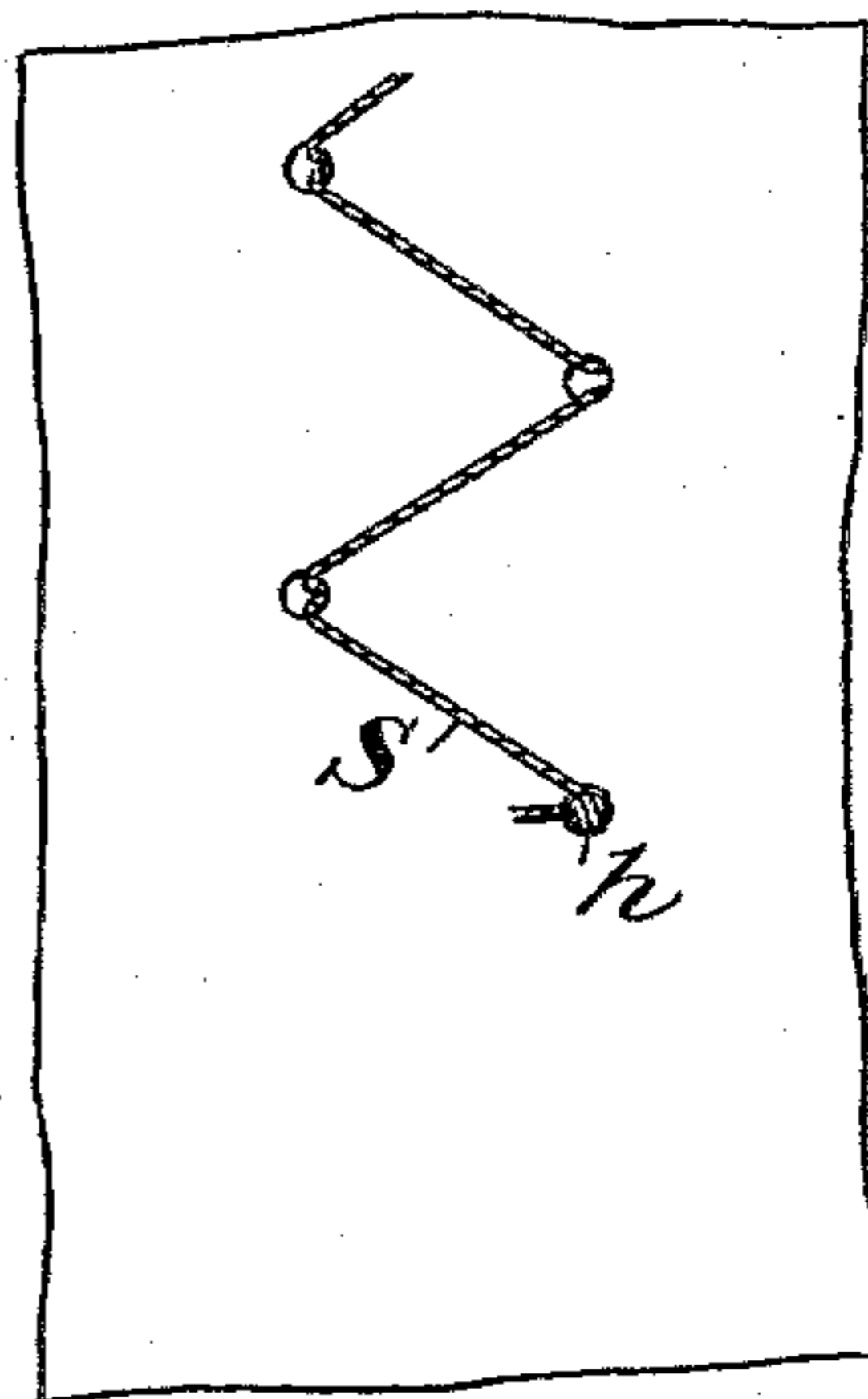


Fig. 7.

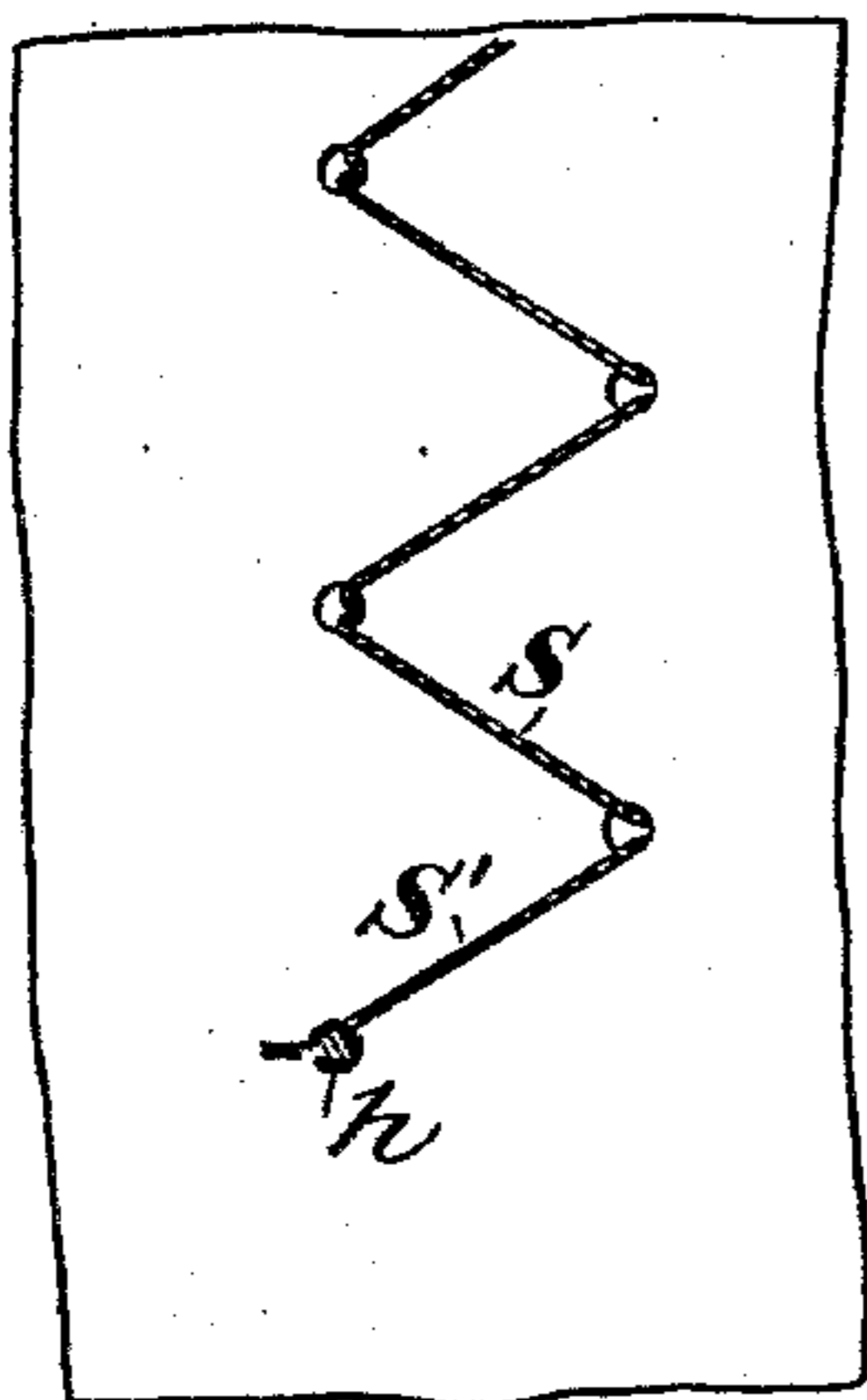


Fig. 8.

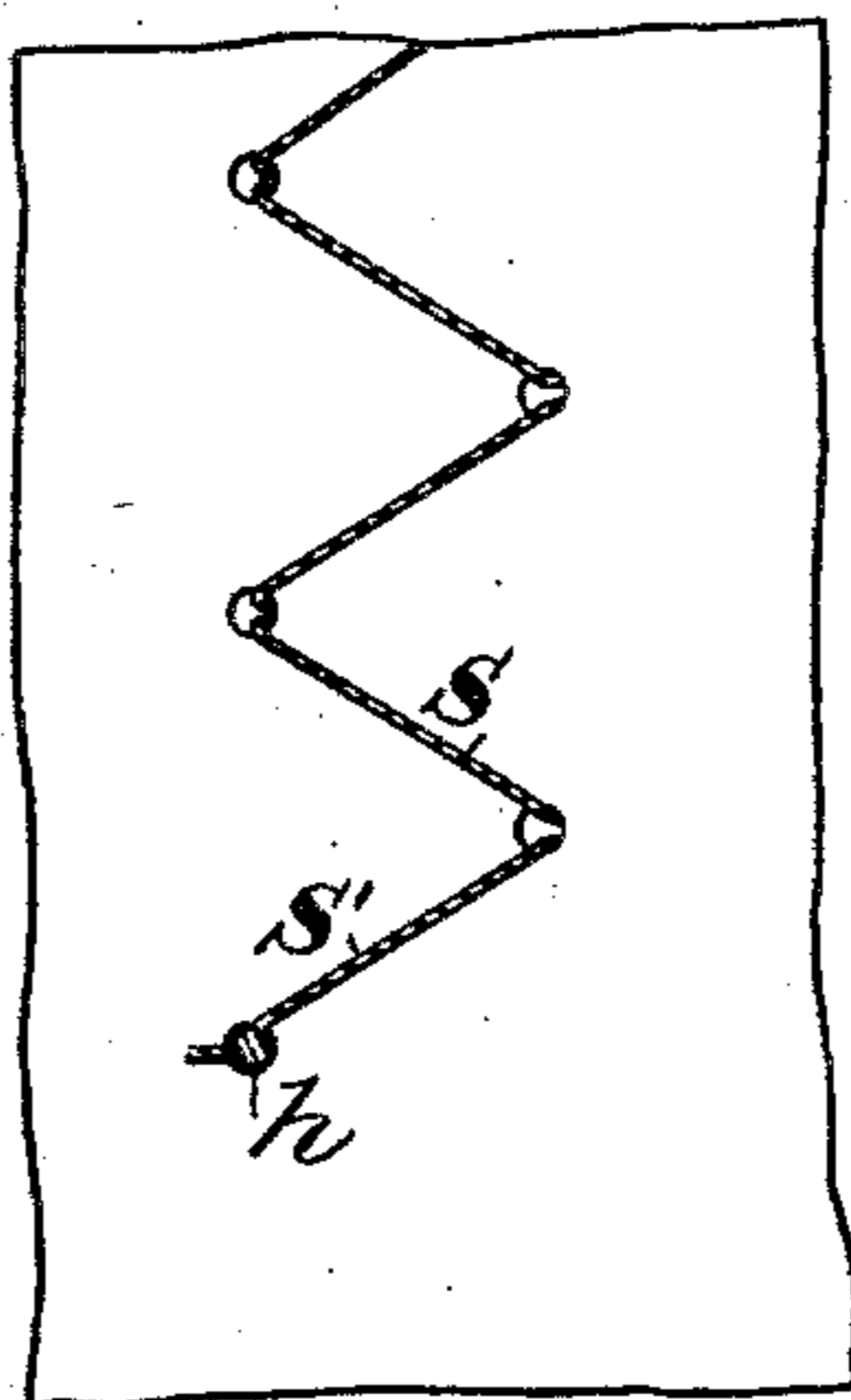
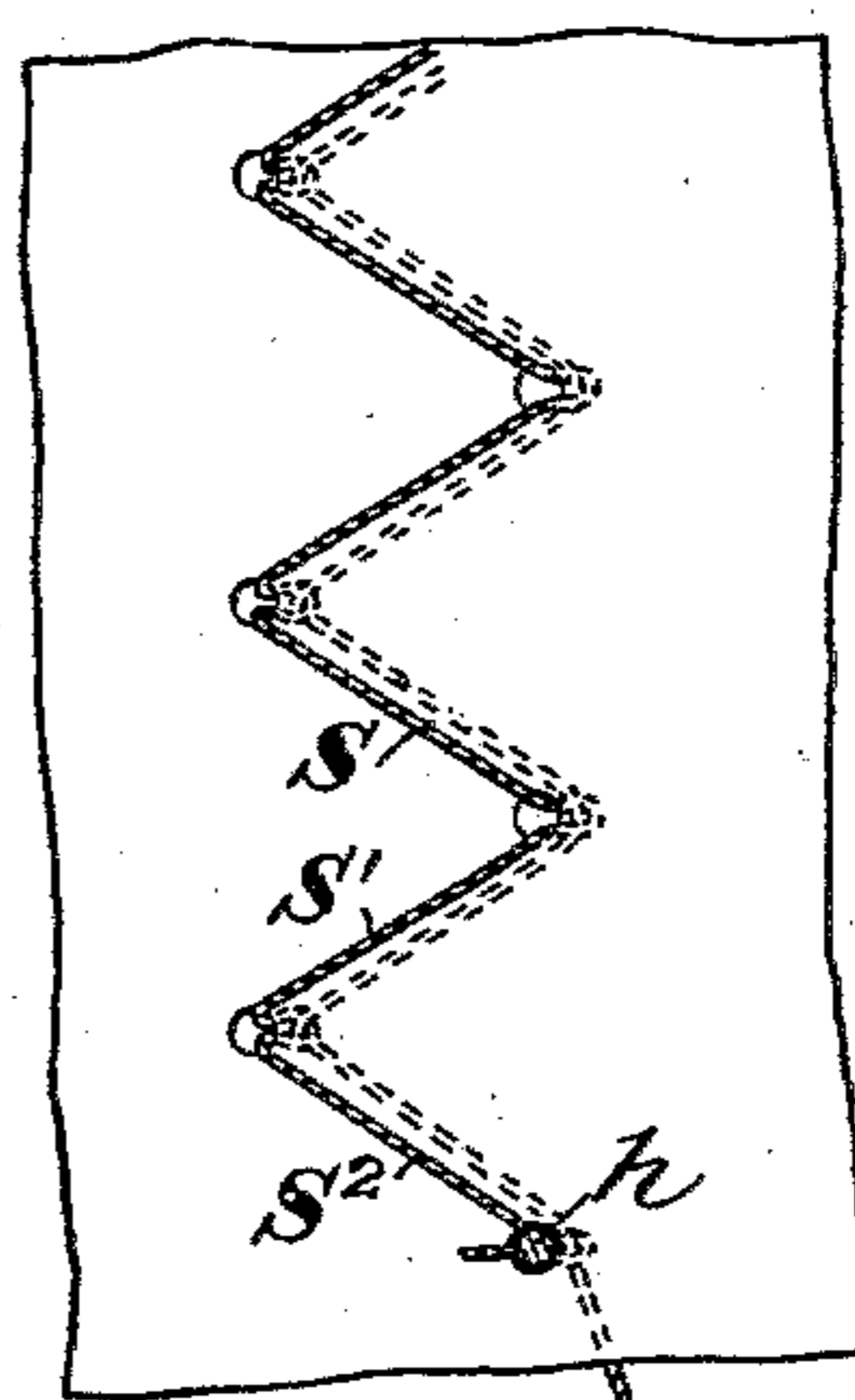


Fig. 9.



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Brown & Duvall

UNITED STATES PATENT OFFICE.

GEORGE W. WEISS, OF BROOKLYN, ASSIGNOR TO JOHN STEWART, OF NEW YORK, N. Y.

ZIGZAG-STITCH-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 552,941, dated January 14, 1896.

Application filed January 16, 1893. Serial No. 458,557. (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 work is reciprocated to give the stitch the lateral scope and the needle is caused to feed the fabric forward.

In the accompanying drawings, Figure 1 represents a portion of a sewing-machine in
15 side elevation, partly in section. Fig. 2 is a top plan view of the same. Fig. 3 is a view in end elevation with the face-cap removed. Fig. 4 is a partial end elevation showing the parts back of the needle-bar, and Figs. 5, 6, 7, 8,
20 and 9 show the positions of the needle and thread with relation to previously-formed stitches at intervals during the formation of two successive stitches.

I have chosen to illustrate my invention a
25 machine in which a rotary needle-operating shaft B is mounted in the overhanging arm a of a supporting-frame A fixed to a suitable base a' .

I have omitted to show a looper, as such
30 feature forms no part of my present invention, and it is to be understood that a looper of well-known form, either a rotary looper for a single-thread machine or a reciprocating shuttle for a lock-stitch machine, may be
35 employed.

The work-plate and presser-foot, between which the work is advanced by the swinging movement of the needle, are constructed to move together back and forth across the path
40 of the advancing work, carrying the work with them, the presser-foot having at the same time a vertically-yielding movement to release the work at the moment the needle swings to advance it.

45 The work-plate is denoted by C and is connected with a sliding bar D, shown in the present instance as seated in a dovetail groove a^2 in the base a' . The bar D is connected with one end of a vibrating arm or
50 lever E, pivotally secured to a bracket a^3 on the frame A. The opposite end of the arm

or lever E has an engagement with a cam b on the rotary shaft B, by which the arm or lever E is vibrated as the shaft B is rotated, and the bar D, and hence the work-plate C, are recip-
55 rocated. The pivotal connection of the lever E with the bracket a^3 is conveniently effected by inserting a pivotal bolt e through elongated slots e' and a^4 formed respectively in the lever and bracket, by means of which the po-
60 sition of the fulcrum relatively to the ends of the lever may be varied to increase or diminish the movement of the plate C.

The vertically-movable bar F for imparting to the presser-foot its vertical movements
65 toward and away from the work to be held has a bearing f in it, in the present a dovetail bearing in which a dovetail block f' has a sliding movement transverse to the movement of the bar F'. The presser-foot f^2 is attached
70 to the sliding block f' , and said block is connected with the sliding bar D by an arm G, preferably of curved form, as shown, to carry it up out of the way of the work, and having sufficient resiliency to yield to the vertical
75 movements of the bar F and yet sufficiently rigid to cause the block and presser-foot carried thereby to move back and forth in unison with the movement of the work-plate C.

It will thus be seen that the work-plate and
80 presser-foot constitute a combined cloth clamp and feed, one member of which has a vertical reciprocation and both members of which have a lateral vibration or feed movement in a direction at a right angle to the
85 feed movement of the needle-bar H and feed-bar M.

The needle-bar H is supported to rock freely upon the crank-pin b' in the face of the cam-disk I fixed on the end of the rotary shaft B.
90 The cam portion i of the disk I is adapted to bear against one end of a lever K, fulcrumed at k , and thereby tilt the lever K and rock an angle-lever L, pivoted at l , so as to bring one of its arms l' against the edge of the needle-
95 bar H to swing the bar and needle h carried thereby over in the direction in which the goods are to be fed. Such swinging movement of the needle-bar is against the tension of a spring h' , which tends to throw the nee-
100 dle back to its rearward position as soon as the cam i releases the lever K.

Alongside the needle-bar H there is located a needle-guide and feed-bar M, having a foot m somewhat broader than the width of the needle-slot in the work-table through which the needle passes and which serves in connection with the needle to advance the work. The needle-bar moves throughout the greater portion of its vertical stroke independently of and without moving the bar M, but it is connected with the bar M by an arm n of an angle-lever N pivoted to the bar M, the connection being made by a stud h^2 on the bar H, which extends into an elongated bent slot n' in the arm.

The slot n' is arranged with reference to the length of the vertical stroke of the needle-bar, so that the bar M will be lifted a short distance at the latter part of the upward stroke of the needle-bar and depressed by the spring-actuated bar F at the latter part of the downward stroke of the needle-bar.

Another arm n^2 of the lever N is slotted to receive a stud f^3 on the presser-foot bar F, and the bend in the slot n' is such that the lever N will be rocked on its pivot as the stud h^2 travels up and down in the slot, thereby causing the lifting of the presser-foot as the needle approaches the limit of its downward movement and permitting it to fall as the needle leaves the work on its upward stroke.

The feed movement of the needle-bar and feed-bar is regulated by an adjusting-screw 10, Fig. 3, which passes through the frame of the head of the machine and contacts with the arm C' of the lever L. The position of this adjusting-screw manifestly will determine the backward stroke of the needle-bar, and consequently the point of beginning of the feed movement of said bar, and thus, according to such position, will determine the amount of feed given the work.

The movements of the parts are timed relatively to one another as follows: Suppose the needle to be approaching the limit of its downward stroke, as shown in Fig. 1, and at the end of a stitch. (Denoted by S, Figs. 5 to 9.) The engagement of the stud h^2 with the lower portion of the bent slot n has rocked the lever N and raised the presser-foot f^2 from the work, while the latter is held at the limit of its outward movement by the engagement of the arm E with the annular portion of one of the grooves in the cam b . As the needle completes its downward stroke the feed-foot m is caused to descend into engagement with the work by the stress of the springs surrounding the bar F, and will then, together with the needle, be swung forwardly to feed the work by the engagement of the cam i with the lever K. Such advanced position of the work is represented in Fig. 6. As the needle leaves the work on its upward stroke the stud h^2 passing into the upper portion of the bent slot n' permits the presser-foot bar F to drop, clamping the work between the cloth-plate C

and the presser-foot f^2 . As the needle approaches the limit of its upward stroke the stud h^2 engages the arm n at the upper end of the slot n' and lifts the feed-foot m from the work. At this moment the connection between the lever E and the cam b has reached the oblique portion of the groove in the cam b and the work is shifted bodily inward by the simultaneous movement of the work-plate C and presser-foot f^2 under the control of the bar D and its operating-lever E. The position of the needle at this point relatively to the stitch S is shown in Fig. 7. The needle now descends, lifting the presser-foot and permitting the feed-foot to drop, and again feeds the work along into the position shown in Fig. 8, completing an additional stitch S'. The needle then rises, the presser-foot drops, and the feed-foot is lifted, while the work is bodily carried outwardly into the position shown in Fig. 9, and a second additional stitch S² is formed.

What I claim is—

1. In a sewing machine, the combination with a vertically reciprocating and laterally vibrating needle-bar and needle, of a combined needle-guide and feed-bar having a vertical reciprocation and lateral vibration, a vertically reciprocating and laterally vibrating presser-foot, a laterally vibrating cloth-plate, mechanism for giving the requisite movements to the parts named and for causing the lateral movements of the presser-foot and cloth-plate to take place simultaneously, and in a direction at a right-angle to the lateral movements of the needle and feed-bar, and such mechanism including means for causing the vertical reciprocations of the presser-foot and feed-bar to occur alternately, and complementary stitch-forming mechanism; substantially as described.

2. In a sewing machine, the combination with a vertically reciprocating and laterally vibrating needle-bar and needle, of a combined needle-guide and feed-bar having a vertical reciprocation and lateral vibration, a combined cloth-clamp and feed, one member of which has vertical reciprocations and both members of which have lateral vibrations at a right-angle to the vibrations of the needle and feed-bar, mechanism for imparting the requisite movements to the parts named comprising a coupling between the members of the cloth-clamp, whereby their lateral movements will occur simultaneously, and comprising means for causing the vertical reciprocations of the presser-foot and feed-bar to occur alternately, and complementary stitch-forming mechanism; substantially as described.

3. In a sewing machine, the combination with a vertically reciprocating and laterally vibrating needle-bar and needle, of a combined needle-guide and feed-bar having a vertical reciprocation and lateral vibration, a combined cloth-clamp and feed, one mem-

ber of which has vertical reciprocations and both members of which have lateral vibrations at a right-angle to the vibrations of the needle and feed-bar, mechanism for imparting the requisite movements to the parts named, mechanism for regulating the feed-movements of the needle-bar and feed-bar and of the cloth-clamp and feed, and complementary stitch-forming mechanism; substantially as described.

4. In a sewing machine, the combination with a vertically reciprocating and laterally vibrating needle-bar and needle, of a combined needle-guide and feed bar having a vertical reciprocation and lateral vibration, a combined cloth-clamp and feed, one member of which has vertical reciprocation and both members of which have lateral vibration at a right-angle to the vibration of the needle and feed-bar, mechanism for imparting the requisite movements to the parts named, comprising a coupling between the members of the cloth-clamp, said coupling including a resilient bar arched vertically, and complemen-

tal stitch-forming mechanism; substantially as described.

5. In a sewing machine, the combination of a vertically reciprocating and laterally vibrating needle-bar and needle, of a combined needle-guide and feed-bar having a vertical reciprocation and lateral vibration, a combined cloth-clamp and feed, one member of which has vertical reciprocation and both members of which have lateral vibration at a right-angle to the vibration of the needle and feed-bar, mechanism for imparting the requisite movements to the parts named comprising a coupling between the members of the cloth-clamp, whereby their lateral movement will be simultaneous, and a vibratory actuating lever, and complementary stitch-forming mechanism; substantially as described.

GEORGE W. WEISS.

Witnesses:

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