

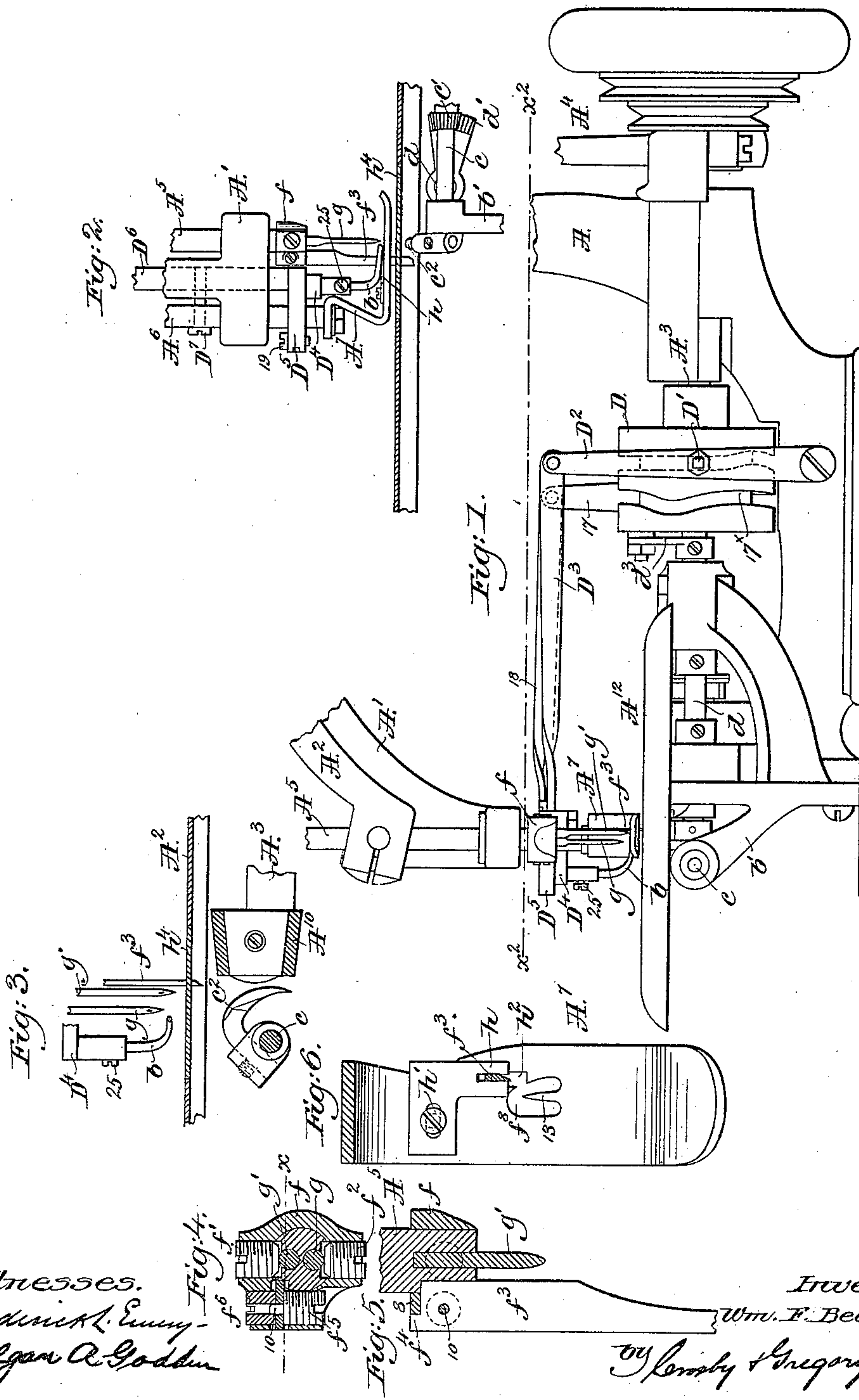
(No Model.)

4 Sheets—Sheet 1.

W. F. BEARDSLEE.
SEWING MACHINE.

No. 438,794.

Patented Oct. 21, 1890.



Witnesses.
Frederick L. Emery
Edgar A. Goddard

Inventor.

Wm. F. Beardslee,

by Lemley & Gregory attys.

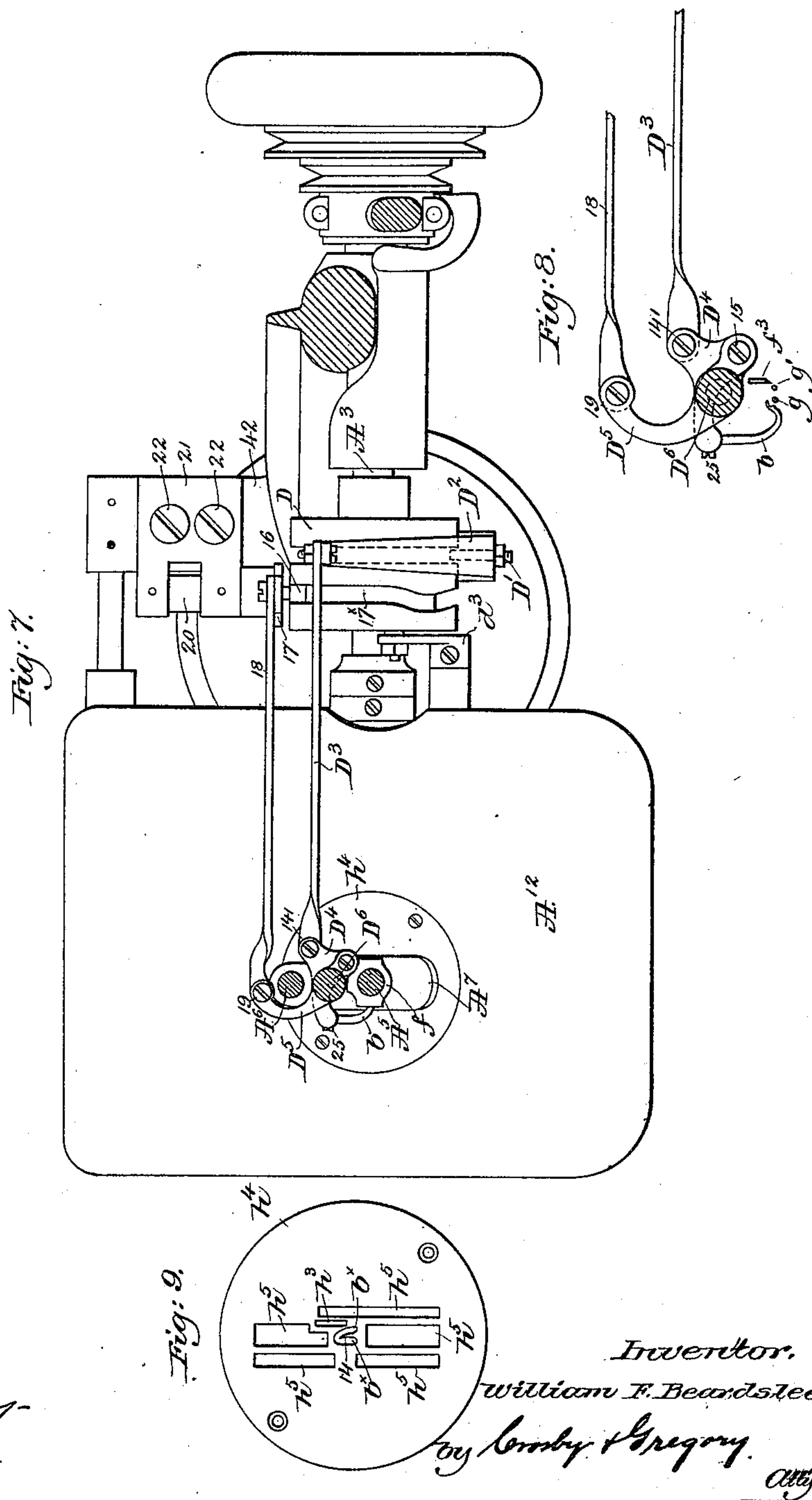
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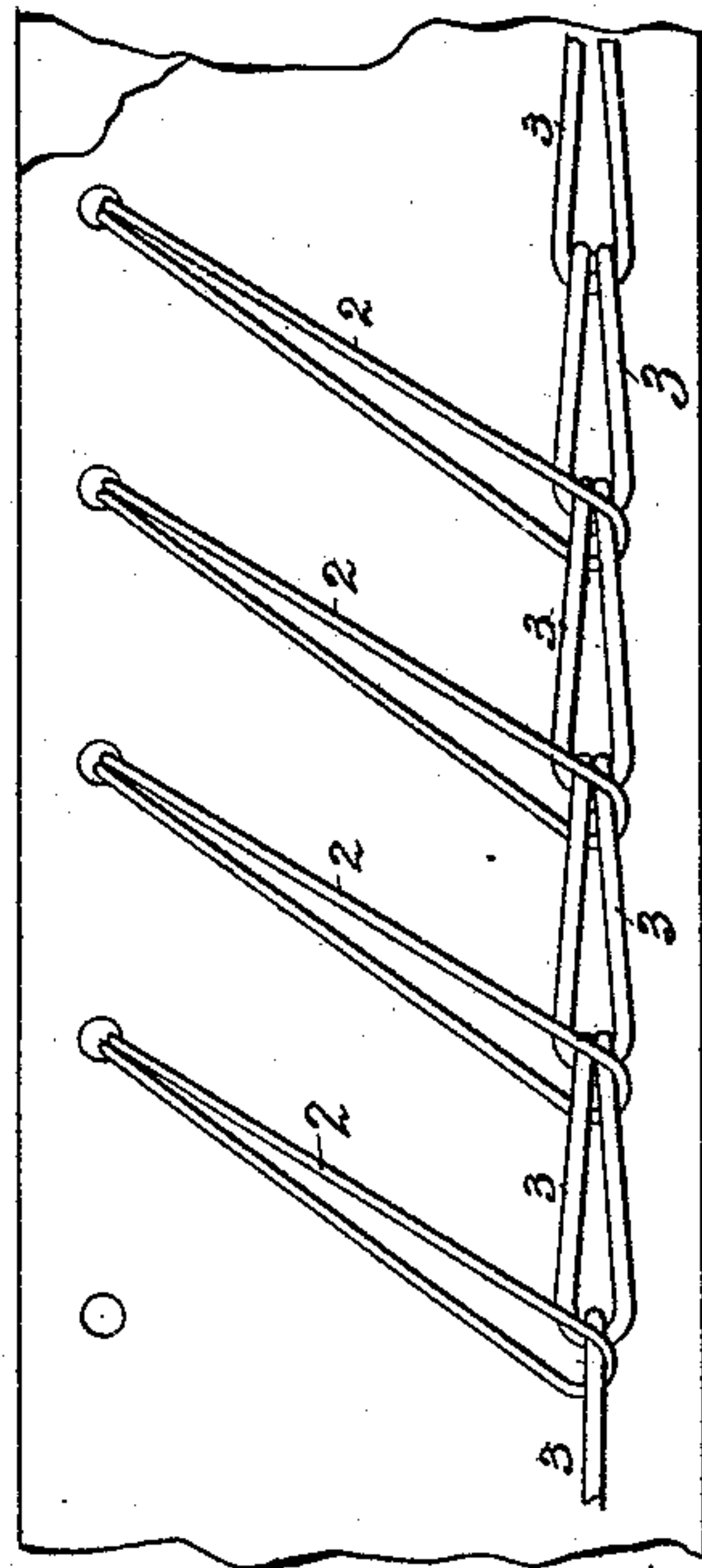
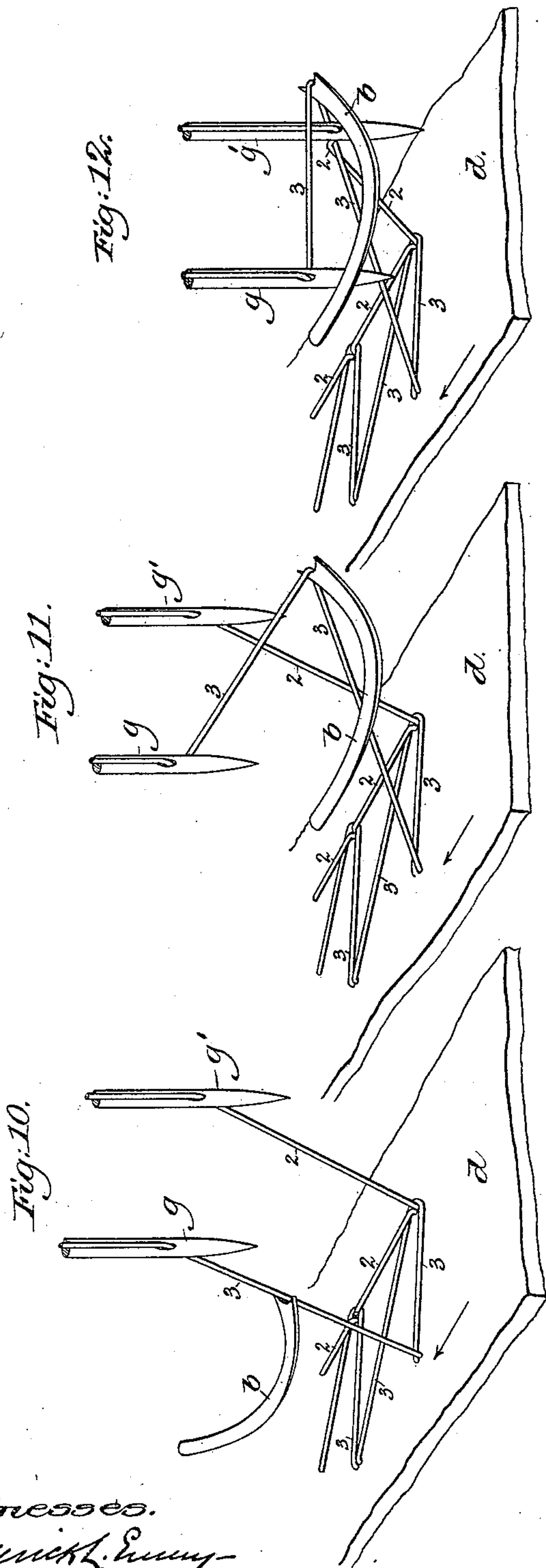
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(No Model.)

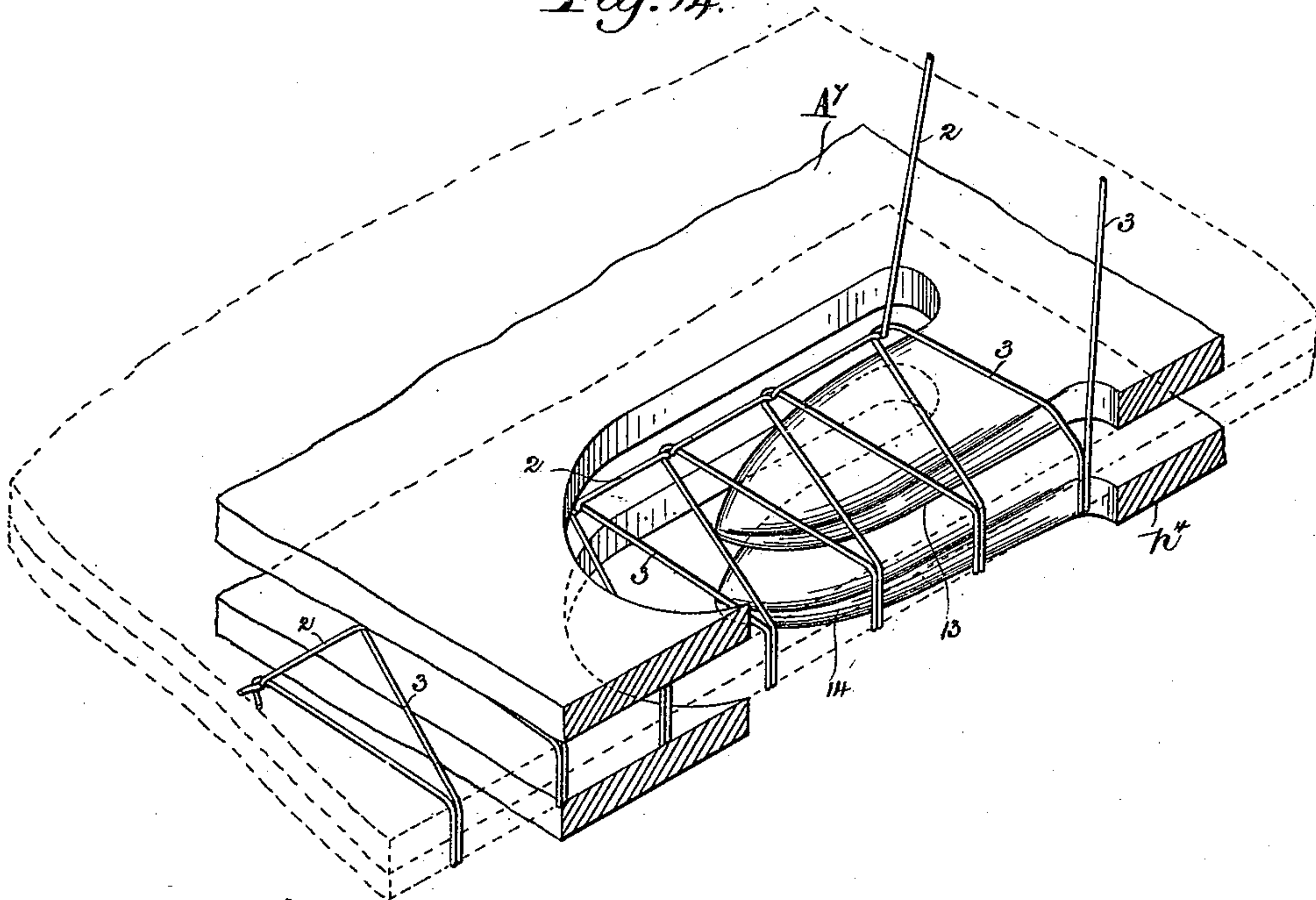
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Fig. 14.



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UNITED STATES PATENT OFFICE.

WILLIAM F. BEARDSLEE, OF NEW YORK, N. Y., ASSIGNOR TO THE MANUFACTURER'S SPECIAL MACHINE COMPANY, OF DANBURY, CONNECTICUT.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 438,794, dated October 21, 1890.

Application filed March 7, 1890. Serial No. 342,978. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BEARDSLEE, of New York, county of New York, State of New York, have invented an Improvement in
5 Machines for Sewing and Trimming Material, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention has for its object the production of a novel sewing-machine by which to sew parallel seams by the employment of two threads carried by two eye-pointed needles located side by side, the said threads being
15 concatenated one with the other above the material and the other with the one below the material.

In the machine containing the stitch-forming mechanism referred to there is a presser-foot and a throat-plate, both of which are provided with two needle-holes, with a projecting rigid finger between, the needles referred to descending at each stitch, one at one and the other at the other side of the said fingers, they lying one directly above the other with
25 the two thicknesses of material to be united between them. The two threads comprising the stitch are concatenated, the first thread with the second thread above the material and the second thread with the first thread
30 below the material, and the said threads are crossed the one over the finger connected with the presser-foot and the other under the finger connected with the throat-plate, the said fingers, located as described, enabling the stitch to be drawn taut and to be subjected to very considerable tension without injuriously puckering the goods, the stitch so
35 formed having a definite amount of elasticity, so that when the two plies of fabric united by the peculiar stitch are trimmed substantially in the line of one of the lines of stitching the said fabric may be opened out flat, the threads where they crossed the fingers affording the necessary amount of slack for
45 such purpose. As the stitching progresses, the threads forming parts of the stitches and crossing the fingers are fed off the ends of the said fingers. With the stitch-forming
50 mechanism and the said fingers, one above and the other below the material, I have com-

bined a trimming mechanism which is adapted to trim the material parallel and close to or substantially in line with one of the rows of stitching, and the said material is trimmed
55 while the stitch is drawn taut and while the material is strained by the stitch, so that the trimming is close to the stretched threads, thus enabling the material when opened out flat to present a flat finished safe seam—one
60 especially desirable for use in connection with knitted material.

One part of my invention consists in a sewing-machine containing the following instrumentalities, viz: a throat-plate having two
65 needle-holes and an interposed finger, a presser-foot having two needle-spaces and an interposed finger, two eye-pointed thread-carrying needles, a looper located above the material, a looper located below the material,
70 and means to actuate the said loopers, the parts being adapted to operate substantially as described, whereby a stitch is formed from two threads carried by the said needles, the said threads being concatenated one with the
75 other above the material and the other with the one below the material, the stitch being formed about the said fingers, both above and below the material, to thus provide for a definite amount of elasticity in the stitch when
80 two thicknesses of material united by the stitch are opened out flat.

With the mechanism just enumerated I have combined a trimming mechanism which trims the material while the stitch is yet held
85 by the said fingers, whereby the material is trimmed substantially in the line of one of the rows of stitching, as will be described.

Other features of my invention will be hereinafter described in the specification and
90 specified in the claims at the end thereof.

Figure 1 is a partial side elevation of a sewing-machine embodying my invention, part of the machine being broken away to save space upon the drawing; Fig. 2, a partial
95 left-hand end elevation of the machine shown in Fig. 1; Fig. 3, a detail chiefly to show the two loopers, the bed-plate, the two needles, and the trimming blade or cutter. Fig. 4 is an enlarged sectional detail showing the lower
100 end of the needle-bar and the clamping device to hold the needles and cutter in place.

Fig. 5 is a section of Fig. 4 in the line x , looking toward the screw f' , the said section-line cutting partially through the shank of the needle g' ; Fig. 6, an enlarged sectional detail showing the top of the presser-foot with the needle-hole and the adjustable cutter-guide attached to the said foot, the cutter being shown in section in place. Fig. 7 is a partial plan and section of the machine shown in Fig. 1, the section being below the line x^2 . Fig. 8 is a detail showing the upper looper, its actuating devices, the two needles, and the cutter in section; Fig. 9, an enlarged top view of the throat-plate, the scale being, however, smaller than that for Fig. 6. Figs. 10, 11, and 12 are diagrams showing the method of manipulating the thread of the needle g above the material, the said figures not, however, showing with particularity the exact shape of the looper b . Fig. 13 is an underside view, enlarged, of the material, showing the formation of the stitch. Fig. 14 is a diagram, much enlarged, chiefly to show the two fingers, one connected with the presser-foot and the other with the throat-plate, with the two threads drawn about them during the formation of the stitch.

The frame-work A , of which the overhanging arm A' forms a part, the needle-bar-actuating lever A^2 , (partially shown in Fig. 1,) the main shaft A^3 , (represented in Figs. 1 and 7,) the eccentric-strap A^4 , embracing an eccentric upon the said main shaft and in practice connected with and so as to vibrate the lever A^2 , the needle-bar A^5 , the presser-bar A^6 , the presser-foot A^7 , the arm d^3 , attached to the shaft d , the bearing b' for the shaft c , having the connected looper c^2 and oscillated by or through suitable gearing d' and c' from the rock-shaft d , the feed-dog carrier A^{10} , and the needles g g' are and may be all substantially as in United States Patent No. 355,053, granted to me December 28, 1886, to which reference may be had.

In this present invention I have provided the needle-bar A^5 with a clamping block or collar f , having two set-screws f' f^2 to act, respectively, upon the needles g g' and hold them in adjusted position in the needle-bar. This clamp also has at its rear side a suitable slot, (see Fig. 4,) in which is placed the upper end of the blade or cutter f^3 , the thickness of the cutter being considerably less than the width of the slot. This cutter has a projection f^4 at its upper end, which abuts against a projection 8, forming part of the clamp f , and the cutter has a hole for the reception of a teat 10, herein shown as projecting from the inner end of a clamping-screw f^5 , which is employed to hold the cutter in place. The clamp receives a second screw f^6 , which I call a "backing-screw," it being shown as adapted to be screwed in or out and form a backing for the cutter f^3 , the position of the backing-screw determining the distance from the line of stitching at which the cutter will trim the material being stitched. To enable the screws

to be moved while the cutter is being adjusted and prevent the cutter from dropping, the teat 10 is made to extend through the cutter and into a hole in the screw f^6 .

The lower end of the cutter is shown reduced in width and is extended through a guide h , attached in an adjustable manner to the presser-foot A^7 by means of a screw h' , the cutter below the said guide passing through a slot h^2 in the presser-foot and through a slot h^3 in the usual throat-plate h^4 , (shown separately in Fig. 9,) the said throat-plate having usual feed-slots h^5 and a double throat b^x b^y , separated by a finger 14. The plate h^4 rests in usual manner on the cloth-plate A^{12} .

The presser-foot has two needle holes or spaces f^8 , separated by a finger 13, the needles descending at opposite sides of the said finger 13, as well as the finger 14, connected to the throat-plate, the finger 13 lying directly above the finger 14 and being stationary, except that the finger 13 rises and falls vertically with the presser-foot, due to varying thicknesses of material under it and to the action of the usual feeding-dog against the material when feeding it forward. The threads 2 and 3, to be described, entering into the formation of the stitch, are carried across from one to the other eye-pointed needle alternately and below the material, as will be hereinafter more fully described, the said threads crossing the one over the finger 13 and the other under the finger 14 during the formation of the stitch, they occupying such positions when the stitch is drawn up taut or set, the threads crossing the said fingers being passed off the ends thereof by the action of the usual feeding device upon the material in feeding the same. These fingers, by their presence in the stitch when being finished, provide for a definite amount of slack thread to constitute elasticity for the seam, so that the material when trimmed may be opened out uniformly and leave its edges abutted together inside the concatenated threads. These fingers remain in the material while the same is being trimmed, the trimming-blade passing through a slot in the presser-foot and acting upon the material between the finger 13 and one side of the presser-foot, the stitches in the material and about the tongues straining the material from the sides of the presser-foot toward the tongue, thus enabling the trimming-blade to cut close to and substantially in the line of one of the lines of stitching.

In practice, were the material to be exhausted between the presser-foot and the throat-plate, even then the machine would continue to form connected stitches about the two fingers as long as the presser-foot remains down. This feature is of especial importance because it enables one piece of knitted goods to pass from under the presser-foot without stopping the continuity of the stitches, and when another piece of knitted material is crowded or inserted under the toe of the presser-foot the stitching commences

therein as soon as it arrives in position under the needles, so that one stocking after another, the parts of which are to be sewed together, may follow in succession without stopping the machine.

With but one finger and with any stitch-forming mechanism known to me it would be impossible for the material to run out from under the presser-foot and have the stitching continued, and then insert a new piece of material under the toe of the presser-foot and continue the stitching, for when the presser-foot is lifted to insert the second piece the thread entering into the stitches formed without passing the thread through the material becomes slack and becomes entangled with the stitch-forming mechanism.

I have provided the main rotating shaft of the machine with a cam-hub D, having two irregular cam-grooves, one of which receives a suitable roller or other stud D', extended from a suitable lever D², the upper end of the said lever having jointed to it a link D³, which is jointed at 141 to a plate D⁴, having as its center of motion a screw or other stud 15, carried by a lever D⁵, having its fulcrum on a plunger or carrier D⁶, arranged in the head of the machine parallel to the presser-bar, (see Fig. 2,) and connected rigidly to the said presser-bar by a screw D⁷, so that the plunger and presser-bar rise and fall in unison. The plate D⁴ has connected to it by a screw 25 the looper b, suitably notched at its outer end, as best shown in Fig. 8, to engage the needle-thread 3 of one of the needles g, as will be hereinafter described. The other groove 17^x in the hub D receives in it a roller or other stud 16 of a lever 17, to the upper end of which is attached loosely a link 18, connected by screw 19 loosely to one end of the lever D⁵.

As will be understood, the lever D⁵ in its movements about the presser-foot will carry the stud 15 with it, and at the same time the plate D⁴, carrying the looper b, will be vibrated through the link D³ and lever D², so that the said looper is thereby made to travel in a somewhat irregular or elliptical or oval path, its movement being such as to engage the loop of thread 3 of the needle g between the material and the eye of the said needle when the latter is elevated, as in Fig. 10, and carry a bight of the said loop across to the line of stitching to be formed by the needle g' and its thread 2 and spread the same open under the said needle g', so that as the said two needles descend the needle g' will pass through the loop in the thread 3, then held spread by the looper b, as in Fig. 12, after which both needles in their further descent will pass through the material. The looper b retires after the needles g and g' have penetrated the cloth, so that the said looper may be again in position to engage the thread 3 when the needles again rise. After the needles g g' have descended below the material they rise a little to throw out loops of thread

from their eyes, and at the same time the looper c² enters both loops of needle-thread and in its backward stroke draws both loops of needle-thread aside with it, the looper taking the loop of thread 2 from the needle g' and carrying it across at the under side of the throat-plate and material to the line of stitching made by the needle g. Both needles are elevated above the material and the feed takes place while the looper holds both loops of needle-thread below the material, and at the next descent of the two needles the needle g passes a loop of its thread 3 through not only its own loop held by the looper c², but also through a loop of the thread 3, the said needle g' in its descent with the needle g, as before described, passing through a bight of the thread 3 coming from the needle g and laid upon the material by the looper b. This process of stitching is continued stitch after stitch, the feed taking place at the proper time, and two parallel rows of straight-ahead stitching are formed connected at bottom and top by loops of the threads 2 and 3 used in the two parallel rows of stitching, one thread in one parallel row crossing over to the other row of stitching at the top of the material and across the finger 13, while the other thread, which sews a straight row at the upper side of the fabric, is laid across from one to the other row of stitches at the lower side of the material and across the finger 14. The formation of the stitch will be understood by inspection of Figs. 10, 11, 12, and 13 of the drawings, and Fig. 14 shows the stitch about the said fingers.

The lower end of the lever 17 has a stud 20 projecting from it at right angles, which enters a bearing 21, connected to a stand 42 by a screw 22.

The feeding device in the machine herein described may be the same as in the said Patent No. 355,053.

The method of sewing herein described as an incident of the machine has been fully described in United States application Serial No. 342,979, wherein the said method of sewing has been made the subject of claim. The needle-threads may be subjected to tension, as in the patent referred to.

The cutter f³ trims the material parallel with and substantially in the line of stitching made by the needle g' so close as to just remove the material and not cut the threads, leaving the said threads exposed at the cut edge, so that when the material so cut is opened or laid out flat and subjected to a little strain the stitches, especially the loop portions thereof lying upon the upper and lower sides of the material, as fully described, which stitches were formed about the said fingers, will stretch across and cover the material at its upper and lower sides between the two lines of stitching, making a finished, safe, flat, and smooth seam especially adapted for knitted goods.

I do not desire to limit my invention to the

exact shape of the loopers b c^2 or to the exact mechanical devices employed to give to them their proper movements to co-operate with the threads of the two needles and form two parallel rows of stitching concatenated above and below, substantially as represented.

As an equivalent for the looper c^2 , I may employ looping devices, substantially such as employed in United States Patent No. 397,496, they acting to concatenate the two needle-threads at the under side of the material somewhat differently, but yet the full equivalent of that represented in Fig. 3.

It will be noticed that the stitch is produced from but two threads, each carried by an eye-pointed needle, said needles moving simultaneously in the same direction and approaching the material at the same time.

It will be understood in the machine herein described, as in United States Patent No. 355,053, heretofore granted to me, that the two eye-pointed thread-carrying needles and the under oscillating looper operate in like manner—that is to say, the loops thrown out from both the thread-carrying needles below the material will be caught and held by the looper while the needles ascend, the said looper holding both the said loops in such position while the feed takes place, and that both loops are entered by but one of the needles at the next descent of the two needles below the material.

The herein-described trimming-cutter and its holding and adjusting mechanism has been made the subject of an application, Serial No. 355,404, and is therefore not herein claimed.

I claim—

1. A sewing-machine containing the following instrumentalities, viz: a throat-plate having two needle-holes and interposed finger 14, a presser-foot having two needle-spaces and an intermediate finger 13, two eye-pointed thread-carrying needles, a looper located above the material, a looper located below the material, and means to actuate the said loopers, the parts being adapted to operate substantially as described, whereby a stitch is formed from two threads carried by the said needles, the said threads being concatenated one with the other above the material and the other with the one below the material, the stitch being formed about the said fingers both above and below the material to thus provide for a definite amount of elasticity in the stitch, as and for the purposes set forth.

2. A sewing-machine containing the following instrumentalities, viz: a throat-plate having two needle-holes and interposed finger 14, a presser-foot having two needle-spaces and an intermediate finger 13, two eye-pointed thread-carrying needles, a looper located above the material, a looper located below the material, means to actuate the said loopers, and a trimming-cutter, the parts being adapted to operate substantially, whereby a stitch is formed from two threads carried by the said needles, the said threads being concatenated each with the other alternately, substantially as described, above and below the material, the stitch being formed about the said fingers above and below the material and being trimmed close to the said fingers while the latter yet hold or control the stitches uniting the material, as and for the purposes set forth.

3. The presser-foot, its carrying-bar, the connected plunger D^6 , and a lever D^5 , having the said plunger as its center of motion, combined with a looper-carrier, an independent pivot therefor on the said lever, a looper attached to the said looper-carrier, and independent means to oscillate both the said lever and the said carrier, as and for the purposes set forth.

4. The presser-foot, its carrier-bar, the connected plunger D^6 , a lever D^5 , having the said plunger as its pivot, the looper-carrier pivoted on said lever, a looper attached to the said looper-carrier, and independent means to oscillate both the said lever and the said carrier, combined with two eye-pointed thread-carrying needles and a looper, to operate substantially as described.

5. A sewing-machine containing the following instrumentalities, viz: a throat-plate having a finger, a presser-foot having a finger located immediately above the finger of the throat-plate, and stitch-forming mechanism to form a stitch about the said fingers above and below the material grasped between them, combined with trimming mechanism to cut or trim the said material close to one side of the said fingers, as and for the purposes set forth.

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

WILLIAM F. BEARDSLEE.

Witnesses:

ALBERT C. MERRIAM,
ALFRED PARTRIDGE, Jr.