

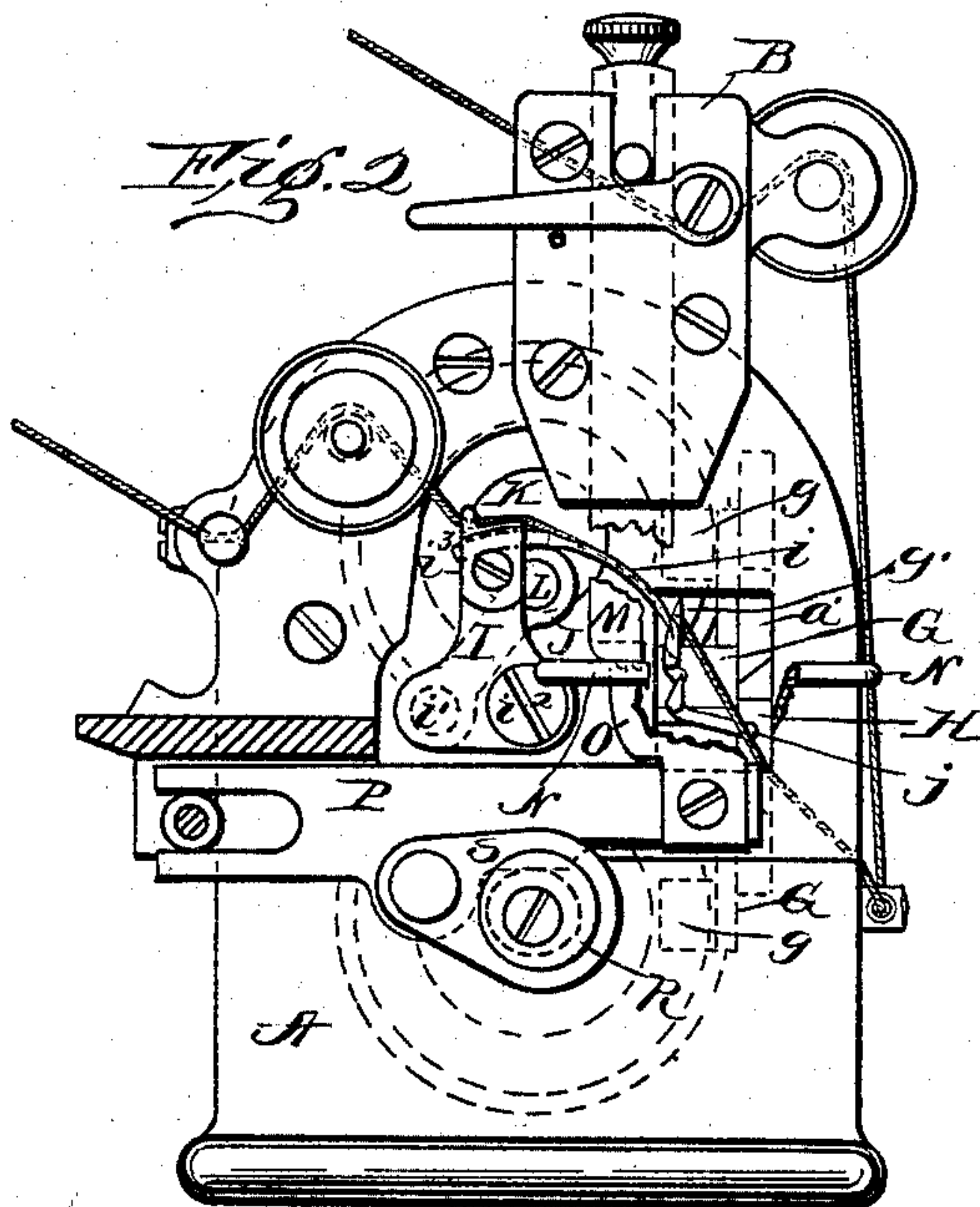
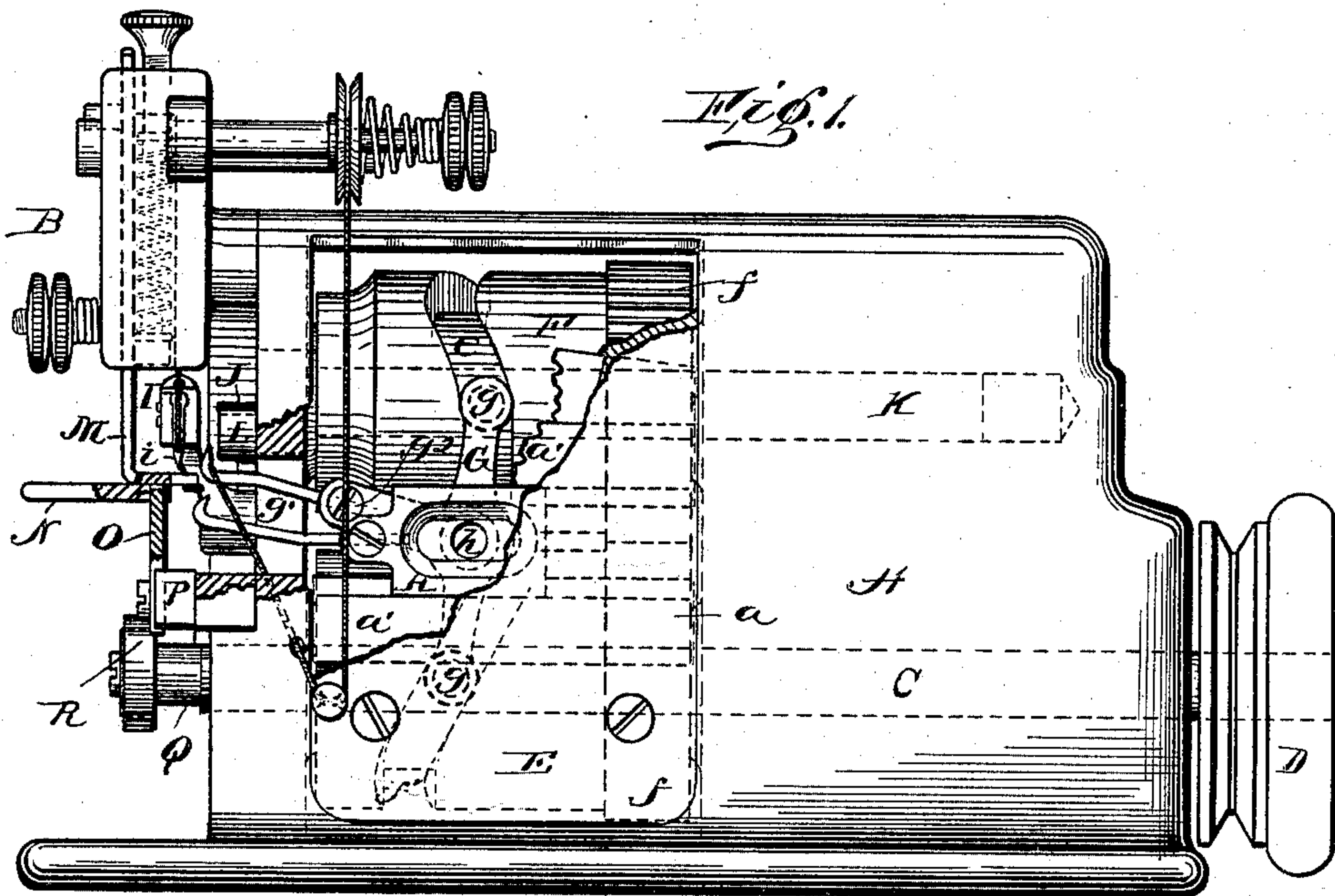
(No Model.)

2 Sheets—Sheet 1.

J. M. MERROW.  
OVERSEAMING SEWING MACHINE.

No. 591,049.

Patented Oct. 5, 1897.



witnesses:  
J. M. Fowler Jr.  
Elizabeth Gifford

Inventor:  
Joseph M. Merrow.  
by Church & Church  
his Attorneys.

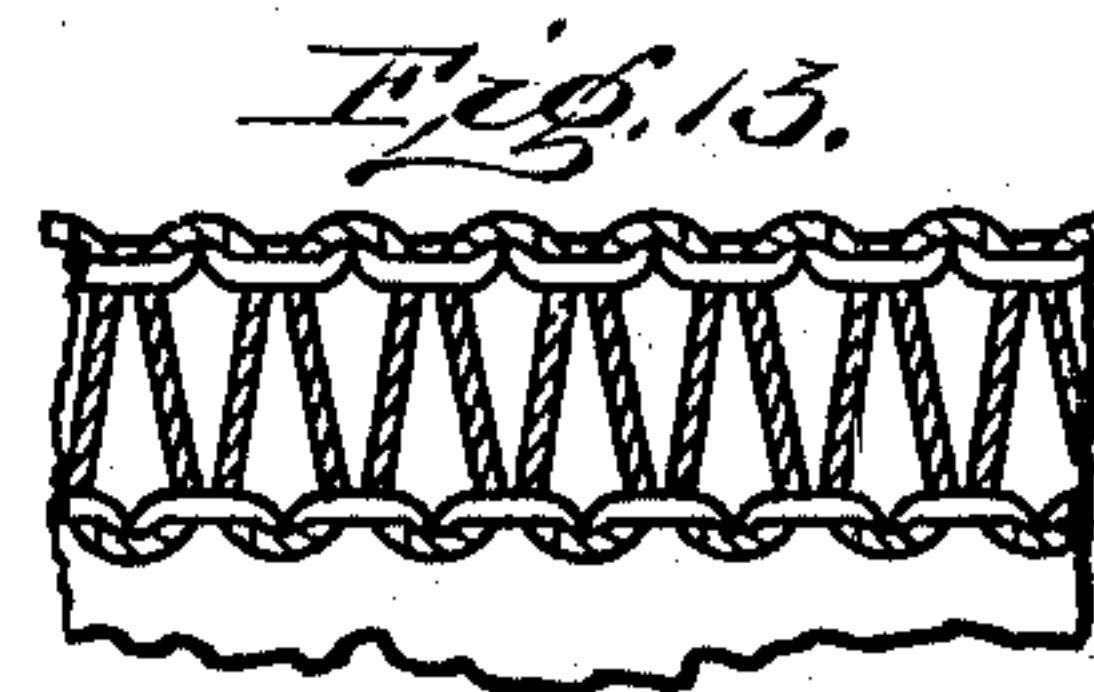
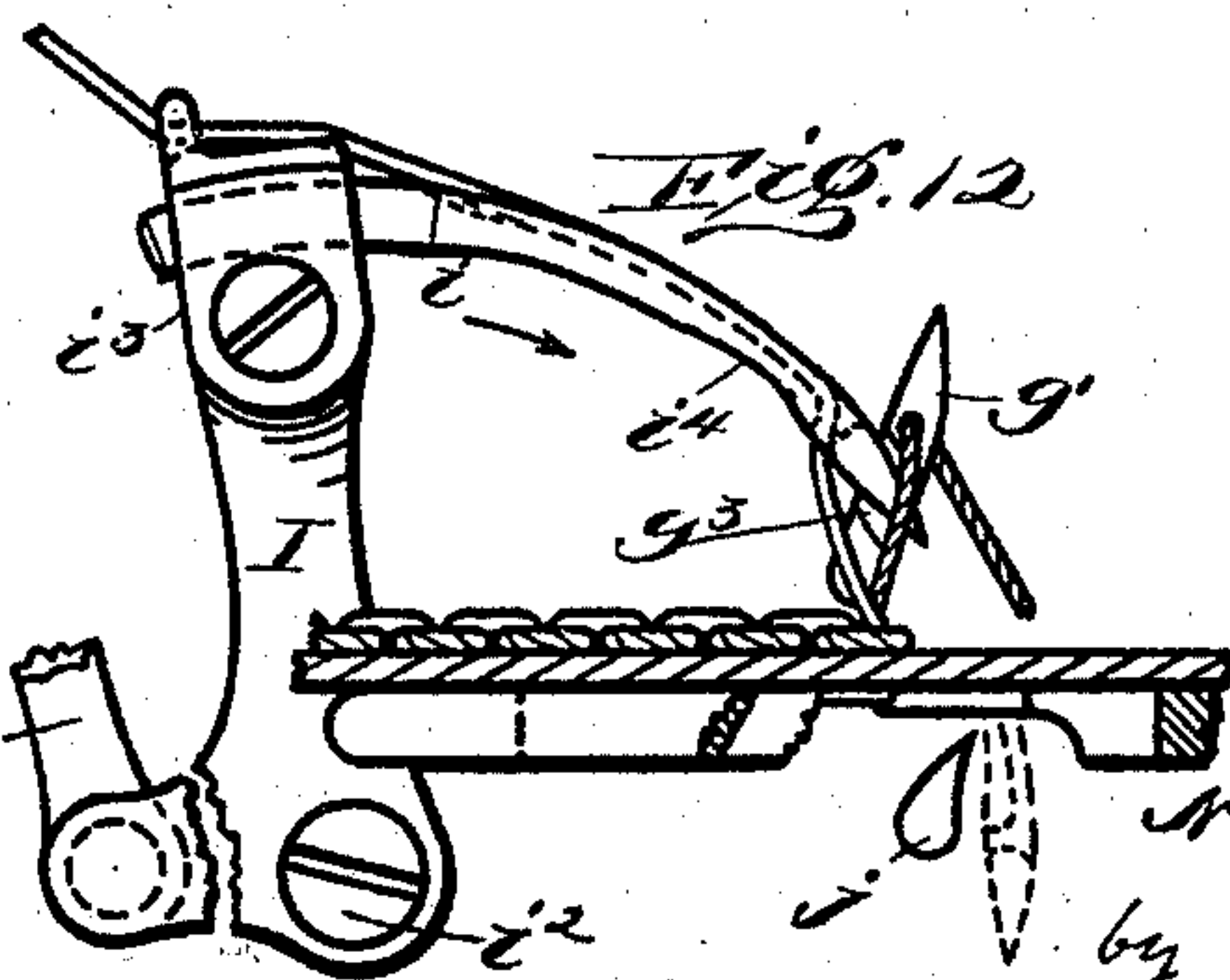
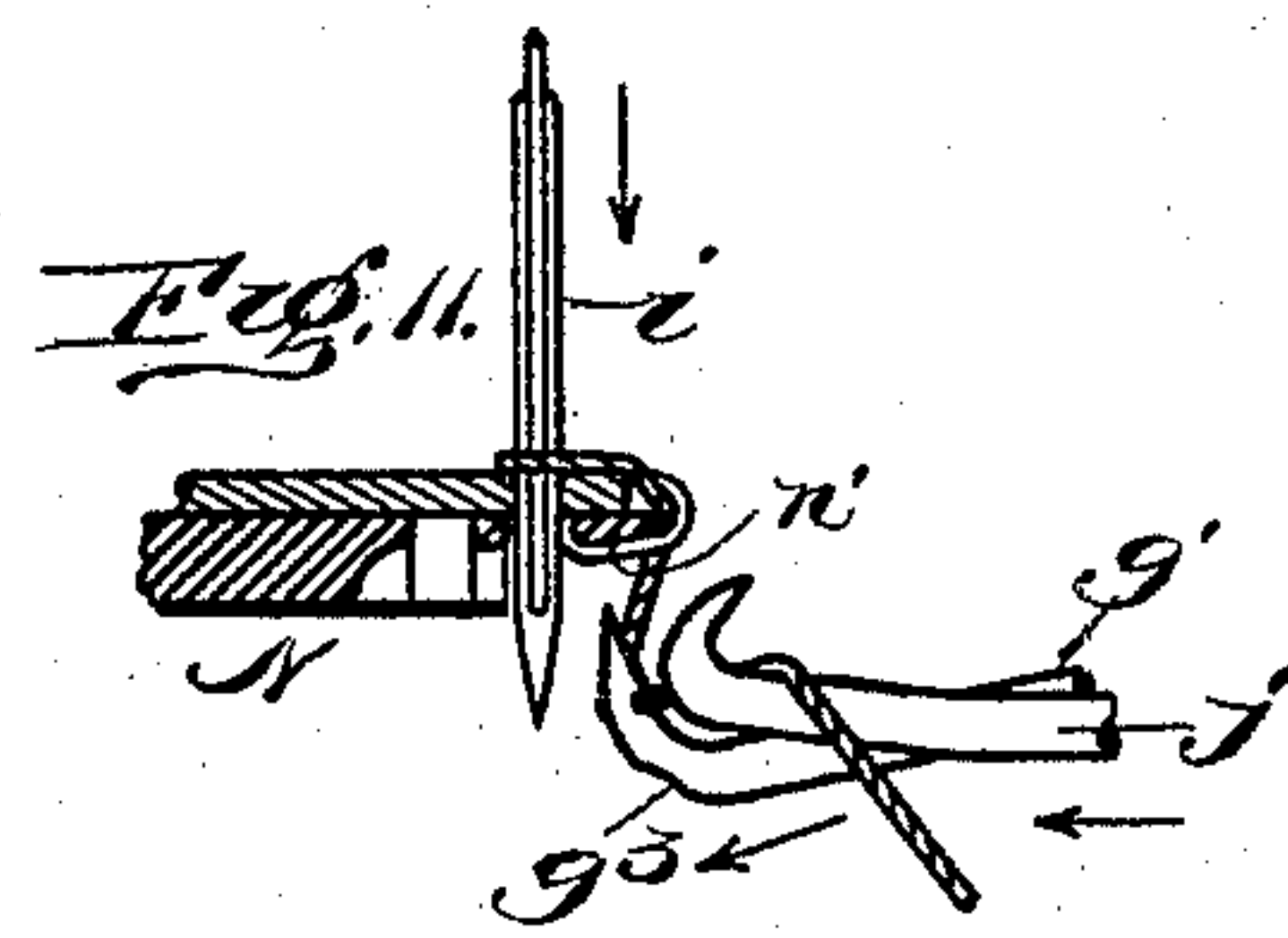
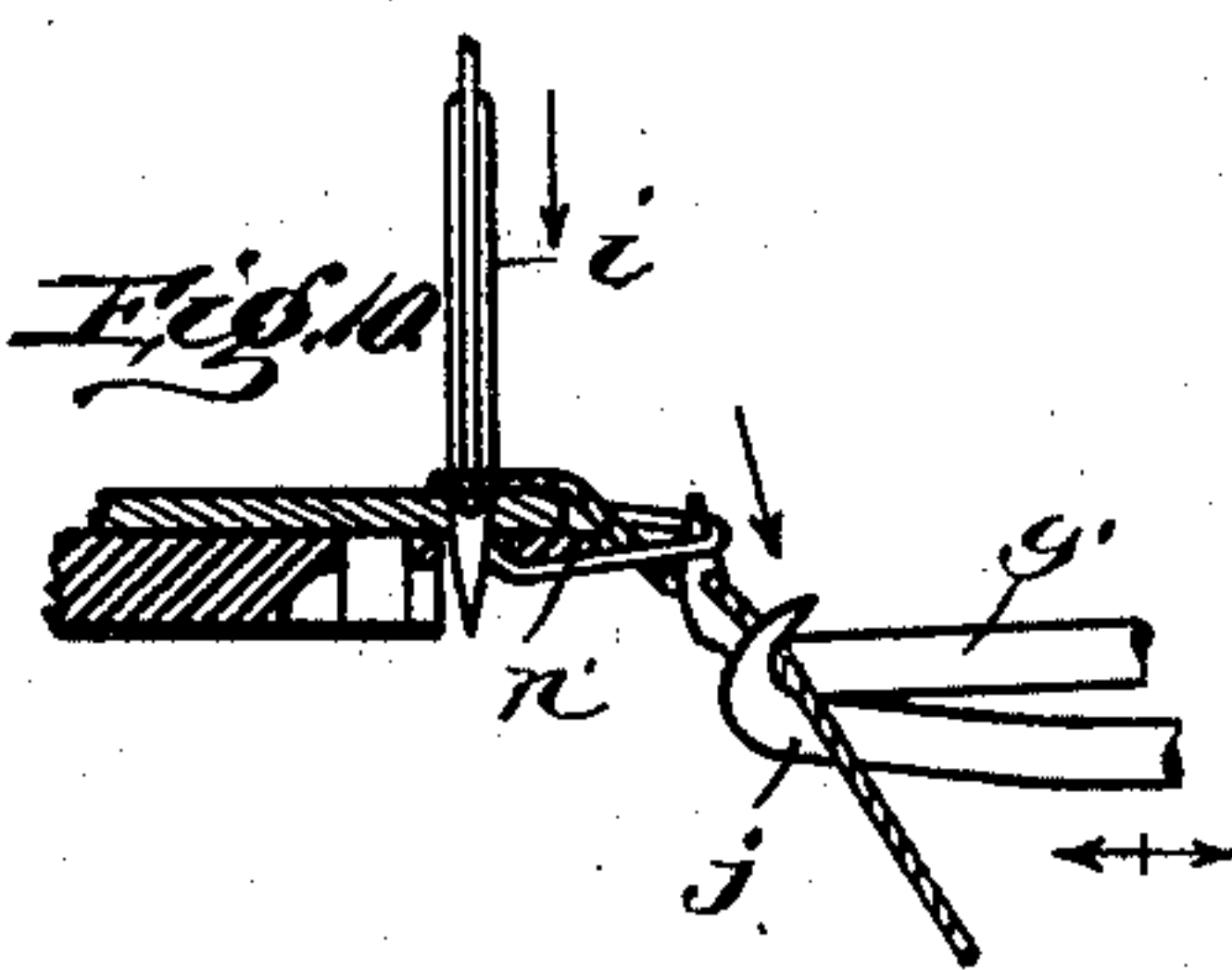
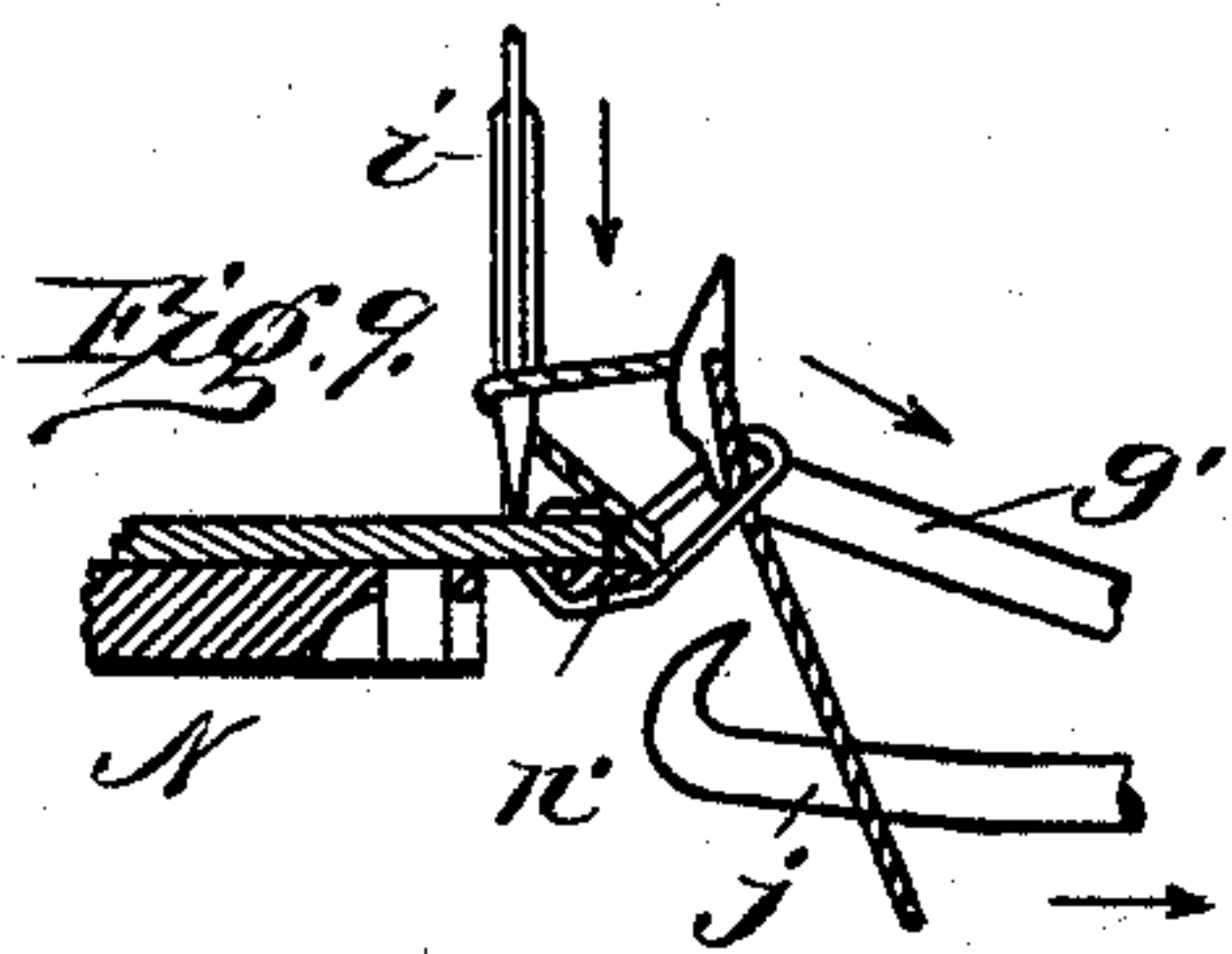
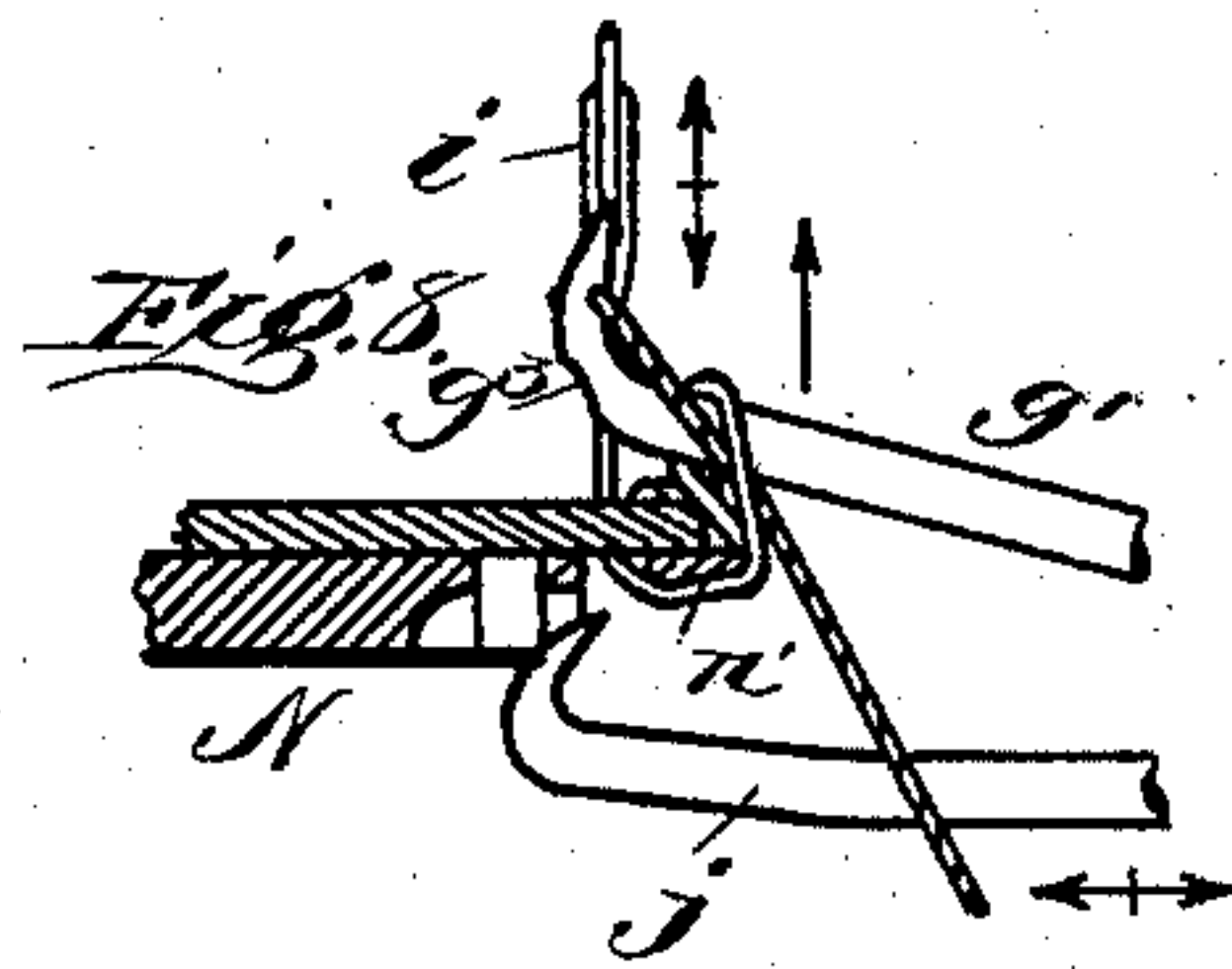
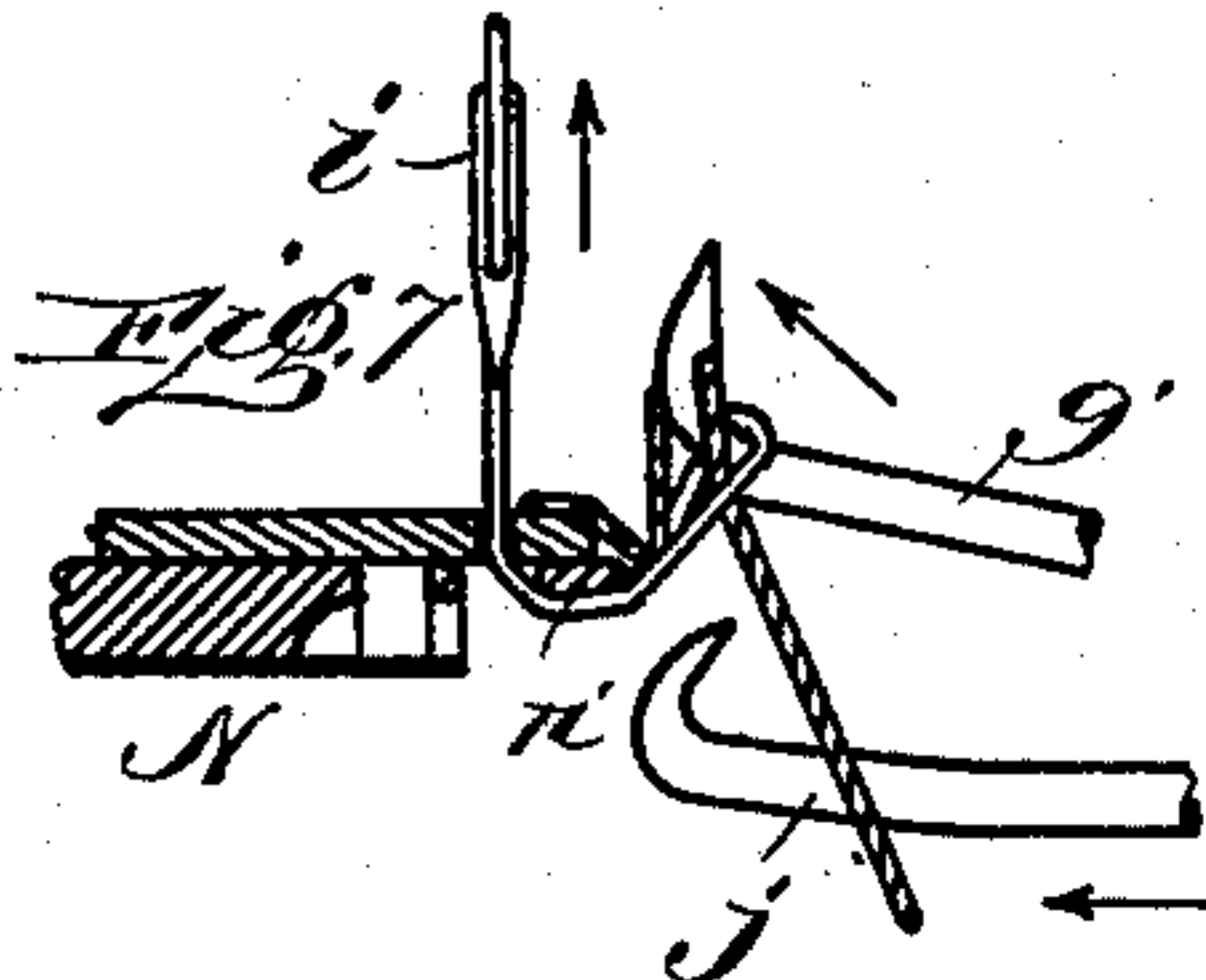
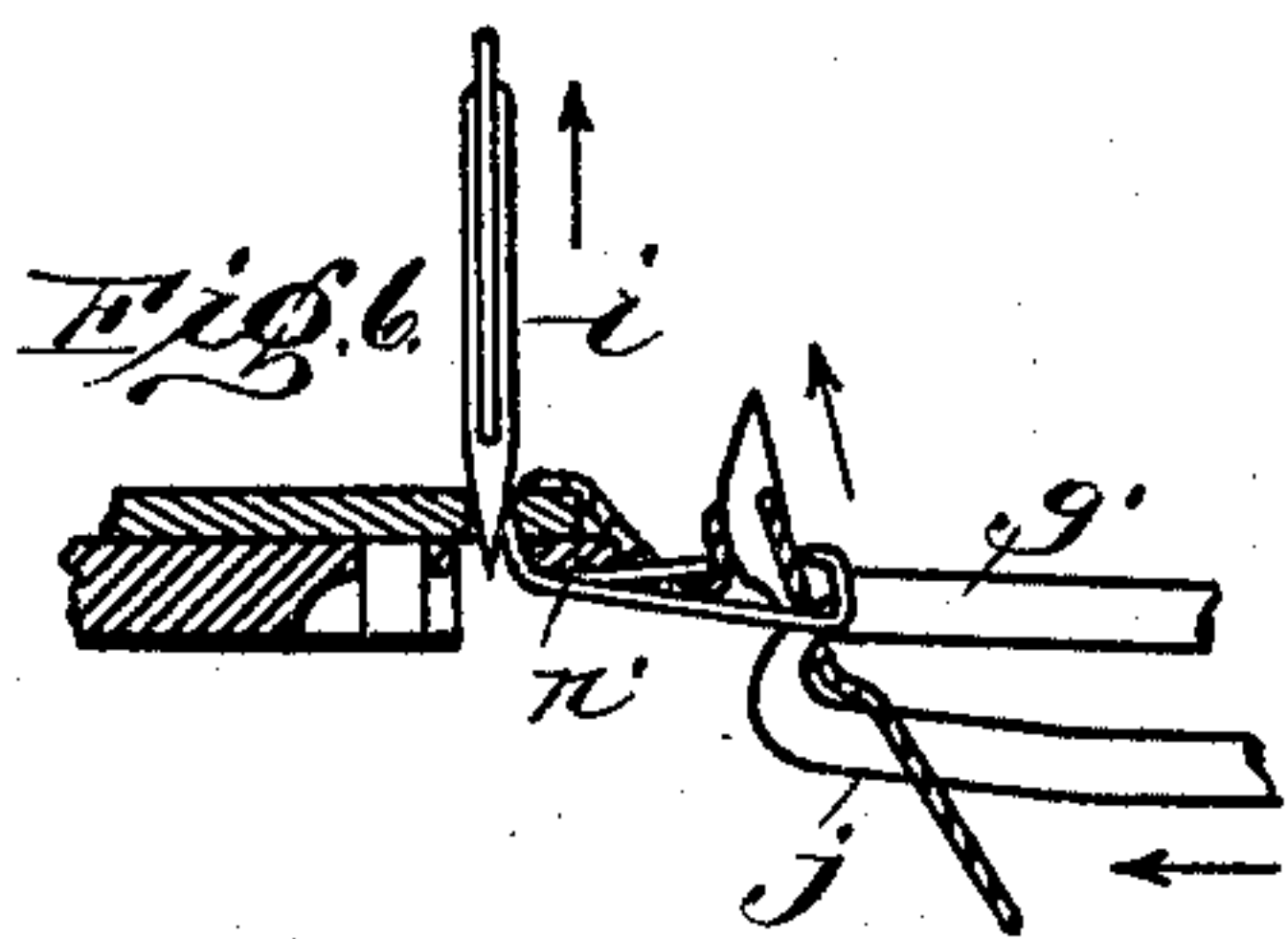
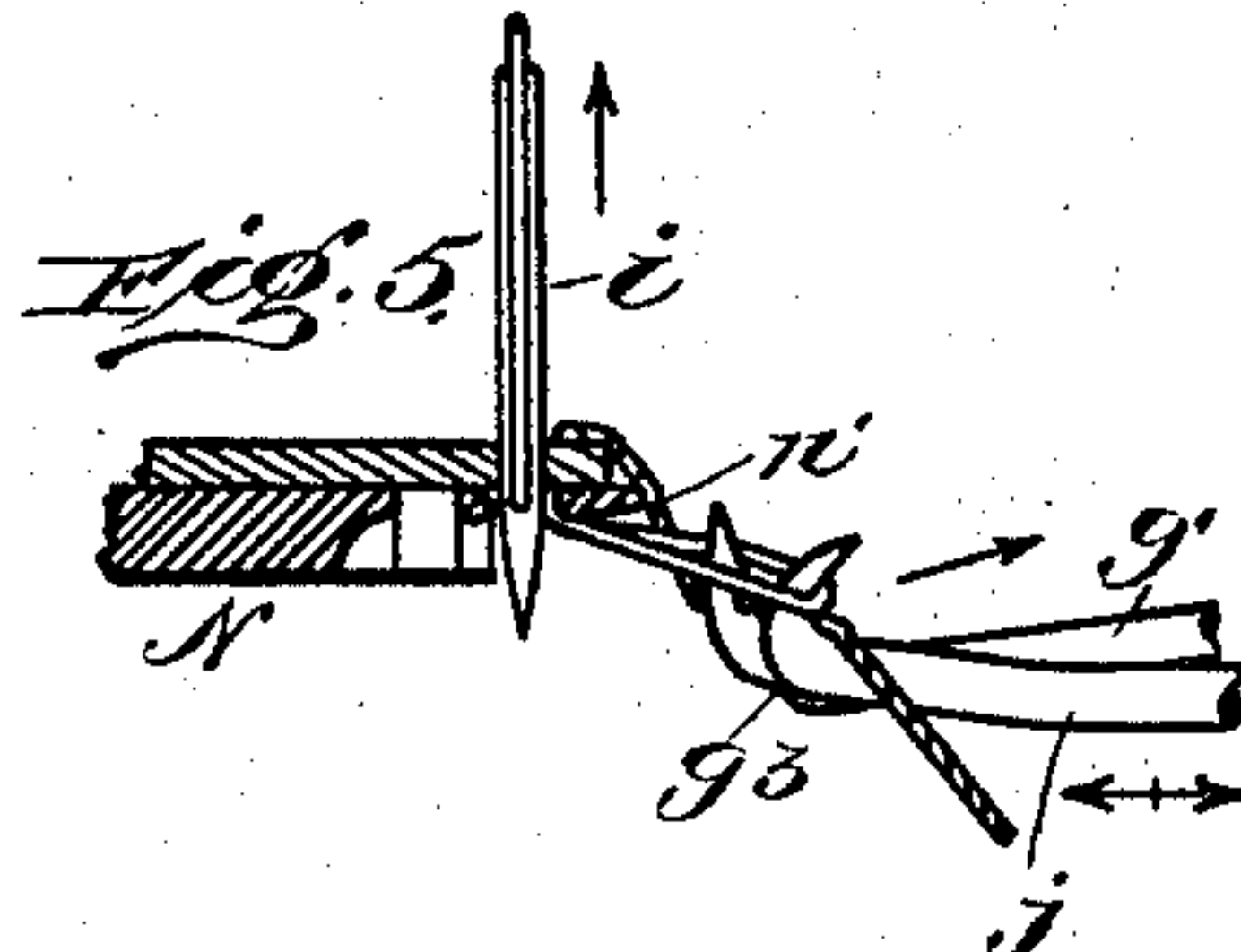
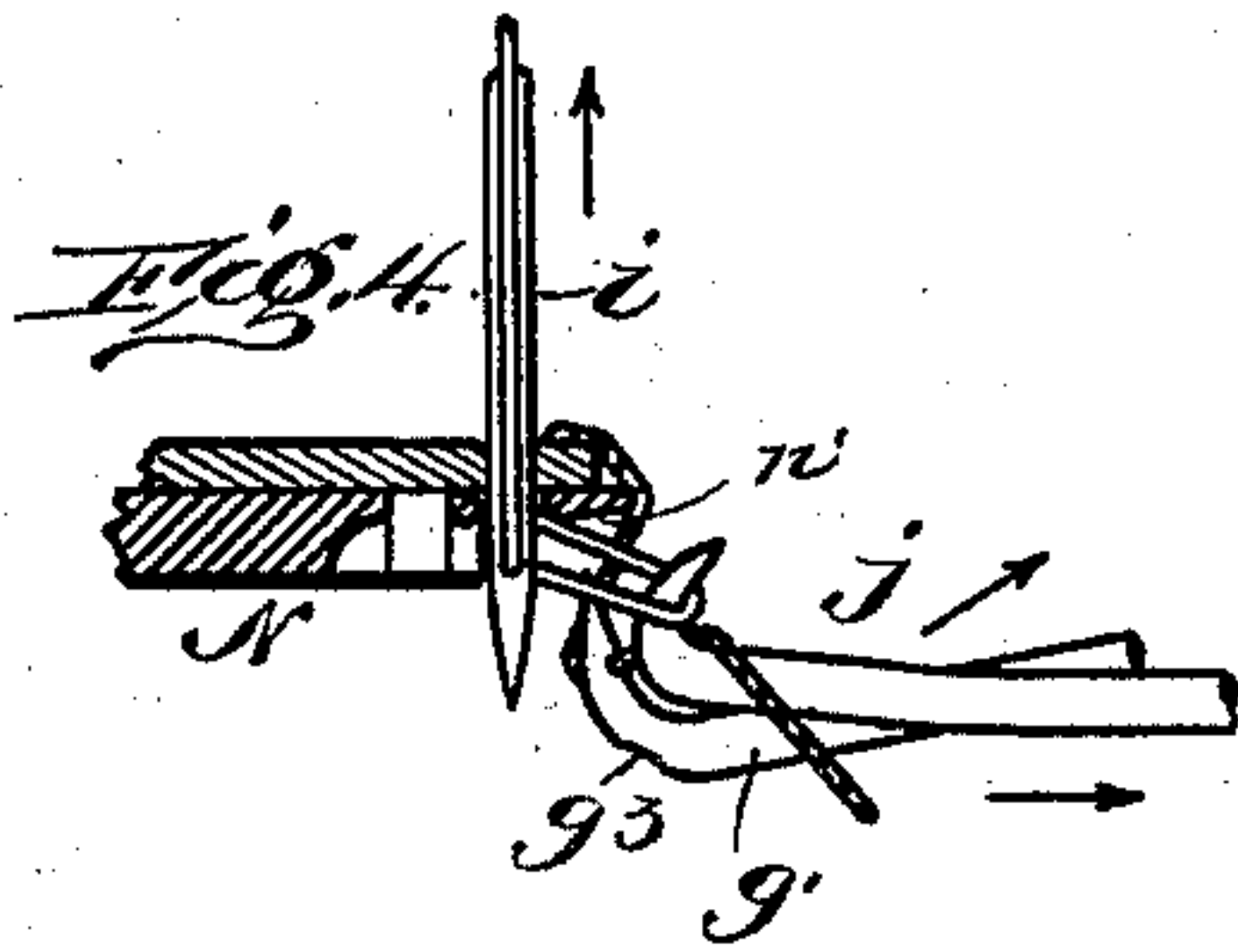
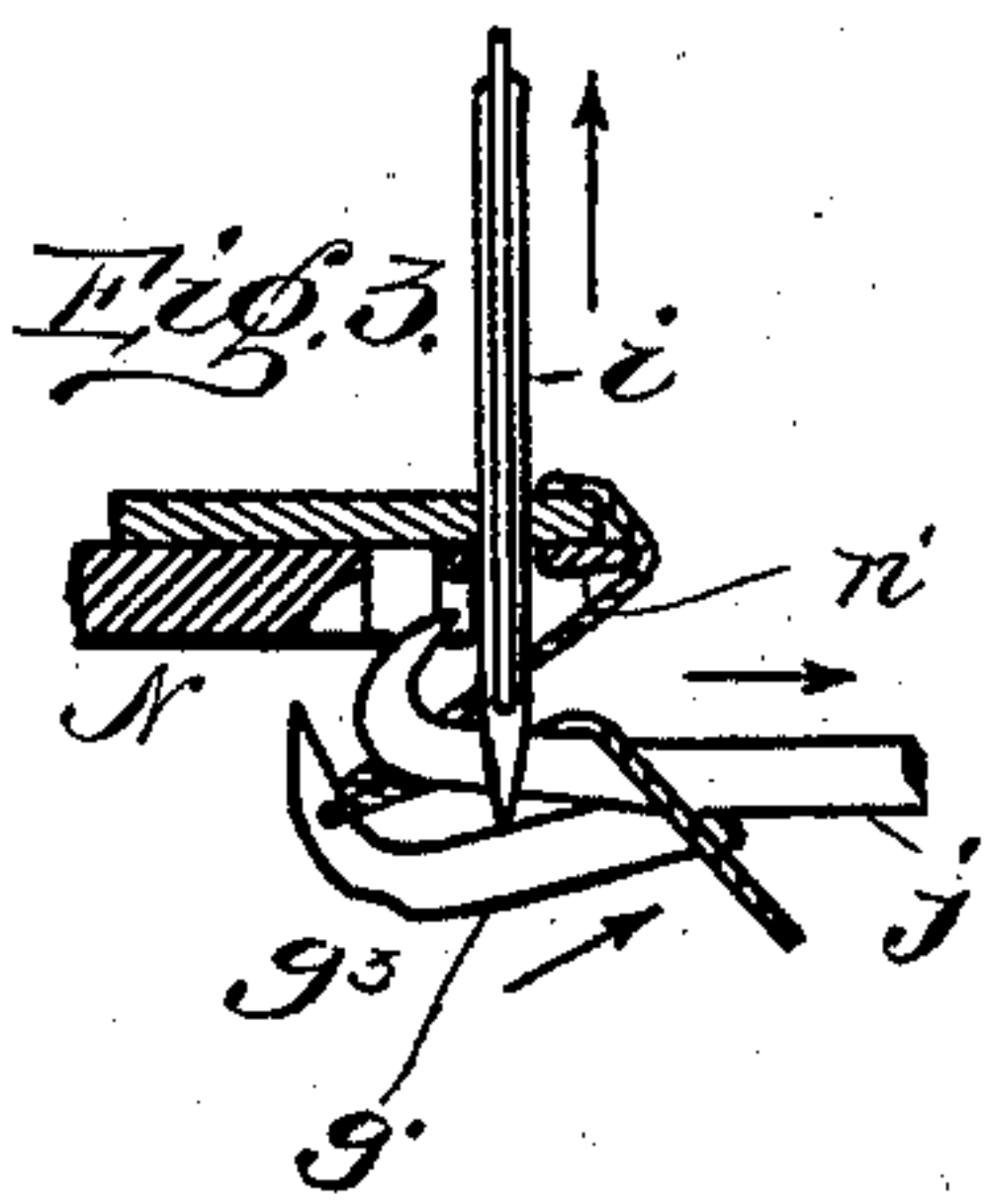
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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

JOSEPH M. MERROW, OF MANSFIELD, CONNECTICUT.

## OVERSEAMING SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 591,049, dated October 5, 1897.

Application filed October 23, 1896. Serial No. 609,791. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH M. MERROW, of Mansfield, (Merrow,) county of Tolland, State of Connecticut, have invented certain  
5 new and useful Improvements in Overseaming Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming  
10 a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in that class of overseaming-machines in which the looping or stitch-forming mechanism comprises three instrumentalities—viz., a thread-  
15 carrying fabric-penetrating needle, a loop-carrier, and a thread-carrying looper—said three instruments coöperating to form from two threads a finish or overseam of the variety known as the “buttonhole-stitch.”

The principal objects of my said improvements are the production of a machine capable of operating and being run at a very high speed, to provide for the ready and independent  
25 adjustment of the stitch-forming implements, and to adapt the stitch-forming implements for use in connection with an existing form of actuating mechanism, thus obviating the necessity for new or special forms  
30 of driving mechanism.

In the accompanying drawings, which form a part of this specification, Figure 1 is a front elevation of a machine embodying this invention, portions being broken away to display the looping mechanism. Fig. 2 is a view  
35 of the left-hand end of the machine with portions also broken away. Figs. 3, 4, 5, 6, 7, 8, 9, 10, and 11 are detached front views showing approximately the relative positions of the main needle, the loop-carrier, the thread-carrying looper, the fabric, and the two threads at different stages of the operations of forming the stitches. Fig. 12 is a detached  
40 view showing the main needle and its carrier, the ends of the loop-carrier and thread-carrying needle, the fabric, and a portion of the work-plate. Fig. 13 is a view of a piece of fabric with its edge provided with a variety of edge-finish or overseaming produced  
50 by this machine.

Similar letters of reference indicate like parts throughout the drawings.

In illustrating the preferred embodiment

of my present invention I have shown it applied to an actuating mechanism of the general type illustrated in Patents Nos. 414,234, 441,315, and 541,722, and before entering into a detail description of the novel features, which latter relate to the looping or stitch-forming devices, I will briefly explain the  
60 general construction and arrangement of said actuating devices.

A indicates the frame of the machine; B, the head; C, the main shaft; D, the hand-wheel; E, the lower main cam; F, the upper  
65 main cam; G, the carrier; H, the sliding block; I, the carrier for the main needle; J, the connecting-rod; K, the upper-cam shaft; L, the wrist-pin; M, the presser-foot; N, the work-plate; O, the feed-dog; P, the feed-carrier; Q, the feed-raising cam; R, the feed-eccentric; S, the feed-eccentric connection.

The main shaft C is journaled in the frame of the machine and carries the lower cam E and also operates the feed mechanism.

The upper cam F is supported upon and secured to its shaft K, which is journaled in the frame of the machine.

The two cams E and F are provided with spur-gears *f f*, attached thereto or made integral therewith, and these gears mesh so that both rotate together. One of said cams  
80 is provided with a groove *e* and the other with a groove *f'*, into which projects the pins *g g*, attached to the carrier G.

The carrier G is pivotally supported upon the cylindrical part *h* of the sliding block H, which latter is supported upon the door *a* and is arranged to slide longitudinally between the beveled gibs *a' a'*, secured to said  
90 door. The carrier G is provided with pins *g g*, which project into the cam-grooves *e f'*, and preferably said pins are provided with rolls.

From the foregoing description it will be seen that the actuating devices for the needle-carrier and the devices controlling the movements of the oscillatory reciprocating carrier G are substantially the same as those of the prior patents mentioned, and, further,  
100 that the latched needles and the backwardly-hooked looper of said patents have been omitted in order to receive the two instruments which are to coöperate with the needle in forming the stitch.

The two new instrumentalities of the stitch-



forming mechanism which characterize my present invention are the loop-carrier *j* and the thread-carrying looper *g'* in their coöperative arrangement with the main needle *i*.

5 The loop-carrier *j* is provided or formed with a pointed and upwardly-curved or somewhat hooked extremity and is secured to the reciprocating block H, preferably by means of a set-screw, as shown.

10 The thread-carrying looper *g'* has its operating end or point curved or bent upward and is provided with an eye for carrying a second thread, and the shank or body is suitably curved or bent, so as to stand out of the path of the loop-carrier. Said thread-carrying looper is adjustably secured to the carrier G, preferably by means of a set-screw, as at *g*<sup>2</sup>, so that it may be adjusted longitudinally or rotated axially.

20 The main needle *i* is curved longitudinally and is detachably secured to its carrier I by means of a clamp *i*<sup>3</sup> and its screw.

The main needle *i*, loop-carrier *j*, and thread-carrying looper *g'* each partake of and are controlled by the movements of the carriers to which they are respectively attached. Thus the needle *i* partakes of the reciprocating motions of the needle-carrier I, which latter is pivotally mounted on the frame by means of screws *i*<sup>2</sup> and is driven through connection 30 J from wrist-pin L on cam-shaft K. The thread-carrying looper *g'* partakes of the oscillatory reciprocating movements of its carrier G, the latter being pivotally supported upon the reciprocating or sliding block H and controlled in its movements both longitudinally and laterally in a vertical plane by the walls of the grooves *e* and *f'* in the rotating cams E F, acting upon pins *g g* on opposite 40 arms of the said carrier G, and the loop-carrier *j* partakes of the horizontal reciprocating movements of the sliding block H, to which it is attached, said reciprocating movements being derived from cams E F, acting through 45 carrier G upon said sliding support or block H.

The feed-dog or other feeding mechanism for advancing the fabric operates in the usual manner, and by preference the work-plate is or may be provided with a finger *n'*, of the 50 usual form, to support the fabric at the edge, and around or upon which the stitches may be formed. In applying or using my improvements in connection with this form of actuating mechanism I prefer to make the forms or curves of the grooves *e* and *f'* such that the outer or curved end of the thread-carrying looper *g'* will be reciprocated alternately above and below the work plate or finger—that is to say, so that its pointed end will be carried from below the work-plate around the edge thereof and forward and back above the work-plate, down around the edge, and again forward under the work-plate, thus completing a cycle of movements—while the loop-carrier *j* will reciprocate in a straight line below the work-plate.

It will be observed in this machine that al-

though the thread-carrying looper *g'* and the loop-carrier *j* derive their respective movements from the same cam-grooves *e f'* their 70 operating ends or points travel in different paths and at different speeds, the loop-carrier *j*, reciprocating in a straight line below the work-plate, remaining stationary, or nearly so, at two or more points of its travel, while 75 the thread-carrying looper *g'* has an additional movement imparted to it in a vertical plane.

Having described a practical embodiment of my present invention, I will now proceed to explain the way in which the three stitch-forming instruments coöperate in forming the well-known overseam or overedge finish sometimes called the "buttonhole-stitch." (Illustrated in Fig. 13.)

Referring more especially to Figs. 3 to 12, 85 inclusive, and following the movements and functions of the needle, the loop-carrier, and the thread-carrying looper, I deem it most convenient to commence with the needle at or near its lowest position, at which time the 90 thread-carrying looper and loop-carrier will be below the cloth and approximately in the relative positions shown in Fig. 3. As the needle moves upward, throwing out a loop of its thread or loosening said thread at the side 95 of said needle, the loop-carrier moves toward the right, its point passing between the needle and the loosened thread and carrying said thread in the form of a loop outward horizontally toward and beyond the edge of the 100 cloth, while at the same time the thread-carrying looper will also move toward the right and upward, so that its pointed end will be in position to enter the loop of main thread which has been spread by the increasing size 105 or taper of the end of the loop-carrier, and the needle, loop-carrier, and looper will be brought into relations approximately as represented in Fig. 4.

The needle continuing to rise the loop-carrier 110 continues its course and the end or point of the thread-carrying looper follows the loop-carrier and at the same time rises farther and is caused to enter the loop of main thread still held by the loop-carrier in a manner 115 substantially as shown in Fig. 5. At or about this position the loop-carrier remains stationary, while the other two coöperating elements continue their movements, the thread-carrying looper passing its thread doubled 120 through the loop on the loop-carrier, which latter begins to move toward the left at about this period, as indicated in Fig. 6. The needle continues to rise, the thread-carrying looper continues to tilt upward and to move 125 forward toward the needle above the cloth, and the loop-carrier also moves toward its first position, approximately as shown in Fig. 7, during which movements the loop of main thread is transferred from the loop-carrier to the 130 thread-carrying looper. The needle continues to rise, but very slowly, relatively to the movement of the thread-carrying looper, which latter continues its course until it has



carried the second thread far enough through the loop of main thread to hold it slightly beyond the path of the needle, much as shown in Fig. 8. From this position the thread-carrying looper is preferably tilted upward slightly while the needle descends, the point of the needle passing between the second thread and the side of the thread-carrying looper just below its eye, much as shown in Fig. 12. The needle continues to descend. The thread-carrying looper, after having tilted slightly upward, moves to the right and downward toward the edge of the cloth, the second thread embracing the needle and the main thread embracing the thread-carrying looper and its thread in a manner similar to that represented in Fig. 9. The needle continues to descend and the thread-carrying looper continues to move in a curved path away from the needle and downward, drawing some of its thread through the loop of main thread previously carried from below the fabric and laying its thread over the loop-carrier, as shown in Fig. 10. The needle further descends, carrying its thread doubled through the cloth and through the loop of second thread, while the thread-carrying looper tilts downward and travels toward the left, shedding off the previously-mentioned main-thread loop, which is deposited upon the edge of the fabric with the second thread passing through it and around the needle, as shown in Fig. 11. Continuing the operations a little further will bring all parts of the mechanism back to the starting-point, having finished one complete cycle of operations. Repeating the operations and feeding the fabric a suitable distance during each cycle of operations of the stitch-forming mechanism, a series of stitches will be formed along and around the edge of the fabric or other material operated upon. It will be noticed that after the loop-carrier has let off the loop of main thread, the same having been taken by the thread-carrying looper, the said loop-carrier travels forward and back horizontally under the cloth, while the thread-carrying needle performs its functions above the cloth.

The needle is preferably slabbled, as at  $i^4$ , Fig. 12, to facilitate the passage of the point of the loop-carrier between said needle and its thread below the cloth. The point of the loop-carrier is preferably turned somewhat toward the slabbled portion of the main needle, as will be seen in Fig. 12, the location of the needle when at or near its lowest position being shown in dotted lines below the cloth. The thread-carrying looper is also preferably slabbled at  $g^3$ , near its eye, for the passage of the needle.

The body or shank of the thread-carrying looper is so formed that it can pass the loop-carrier vertically without collision, and the pointed end of the thread-carrying looper is turned somewhat, so that it will certainly enter the loop of main thread carried, spread, and held by the loop-carrier. I usually pre-

fer to use a finger on the work-plate to support the edge of the fabric, and the stitches formed around the edge of the fabric also embrace the finger and pass off as the fabric is fed along, as is common in overseaming-machines. Any known feed mechanism adapted to the purpose may be employed. It will be seen that the loop-carrier takes the main thread from one side of the needle below and carries it beyond the edge of the fabric, at the same time spreading or opening said loop, and that the thread-carrying looper takes this loop from the loop-carrier, passes the second thread through the main-thread loop, and presents the second thread to the needle above the fabric. The usual tensions are employed, and I sometimes find it convenient to employ take-ups for the threads.

While I have described the movements of the stitching implements with some degree of minuteness, it may be noted that considerable variation can be made from the description and yet produce substantially the same results through the same mode of operation.

By varying the movements of the thread-carrying looper I can cause it to exert a greater or less strain upon the loop of main thread surrounding it and thus act more or less as a take-up for said thread.

The loop-carrier may be made to carry the loop of main thread to a greater or less distance away from the needle according to requirements, and the thread-carrying looper may be tilted upward earlier or later in relation to the time of its movement toward the needle above the work-plate, so that the loop of main thread may be transferred from its loop-carrier to the thread-carrying looper earlier or later in relation to the movements of the needle or loop-carrier. The thread-carrying looper may be tilted to a position lower or higher than shown, as may be most advantageous under different conditions, and the thread-carrying looper may be carried to a greater or less distance under the fabric to exert a greater or less pull upon its thread and for a greater or less time, thus acting as a take-up for the second thread.

As will be apparent, any suitable known mechanism may be employed for giving the loop-forming instruments movements substantially as described, but I prefer for various reasons to employ such as is shown and described herein.

Having thus described my invention, what I claim as new is—

1. In an overseaming-machine, and in combination with a work-support and a reciprocating thread-carrying needle, a horizontally-reciprocating loop-carrier, an oscillatory reciprocating thread-carrying looper, moving around the edge of the work-support in a vertical plane, intersecting the path of the loop-carrier below, and of the needle above, the work-support and mechanism for reciprocating the loop-carrier and for reciprocating and oscillating the looper, said loop-carrier being



arranged to draw a loop of the main-needle thread horizontally beneath and toward the edge of the fabric, the looper passing through said loop and advancing upward and laterally therethrough toward the main needle, to deliver the second thread; substantially as described.

2. In an overseaming-machine the combination with the work-support and main-thread-carrying and longitudinally-reciprocating needle, of a longitudinally-reciprocating loop-carrier provided with an upturned point or extremity, and a thread-carrying looper provided with a horizontal shank and upturned point, said looper reciprocating longitudinally of its shank in a plane parallel with the movement of the loop-carrier and oscillating vertically to cross the path of the loop-carrier and traverse alternately on opposite sides of the work-support; substantially as described.

3. In an overseaming-machine, the combination with a fabric-penetrating thread-carrying needle, of a horizontally-reciprocating loop-carrier having an upturned hooked and pointed extremity engaging said needle-thread to draw a loop horizontally beneath the fabric, a thread-carrying looper provided with an upturned point, and actuating mechanism for the needle, loop-carrier and looper, said looper reciprocating alternately on opposite sides of the fabric and passing around the edge thereof in a path intersecting the loop on the loop-carrier below the fabric and the path of the fabric-penetrating needle above the fabric, substantially as described.

4. In an overseaming-machine the combination with a reciprocating main-thread-carrying needle, a horizontally-reciprocating loop-carrier mounted upon a reciprocating support, and a thread-carrying looper pivotally mounted upon the reciprocating support of the loop-carrier to reciprocate in unison

with the loop-carrier and oscillate independently thereof; substantially as described. 45

5. In an overseaming-machine the combination with a work-support and a reciprocating thread-carrying needle, of a horizontal loop-carrier provided with upturned point and mounted upon a reciprocating support, and a horizontal thread-carrying looper provided with an upturned point and pivoted upon the reciprocating support of the loop-carrier, whereby said looper and the loop-carrier are caused to reciprocate horizontally in unison and the said looper is permitted to oscillate independently in a vertical plane and traverse around the edge of the work-support; substantially as described. 50 55

6. In an overseaming-machine the combination with the main or fabric-penetrating needle and its actuating mechanism, of a reciprocating loop-carrier attached to a movable block or support, a thread-carrying looper attached to a carrier pivotally mounted upon said block or support, and actuating devices, such as cams, engaging said carrier to reciprocate both the loop-carrier and looper and to oscillate the latter; substantially as described. 60 65 70

7. In an overseaming-machine the combination with the main or fabric-penetrating needle, its actuating mechanism and a work-plate or fabric-support, of a loop-carrier reciprocating beneath the work-support and secured to a block movable in guides, an oscillatory reciprocating thread-carrying looper secured to a carrier pivotally attached to said movable block or support, and two cams operating upon said carrier to control the movements of the loop-carrier and looper; substantially as described. 75 80

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