

G. NIEDERMAYR.
TWO-THREAD OVEREDGE SEWING MACHINE.
APPLICATION FILED DEC. 28, 1904.

974,910.

Patented Nov. 8, 1910.

5 SHEETS-SHEET 1.

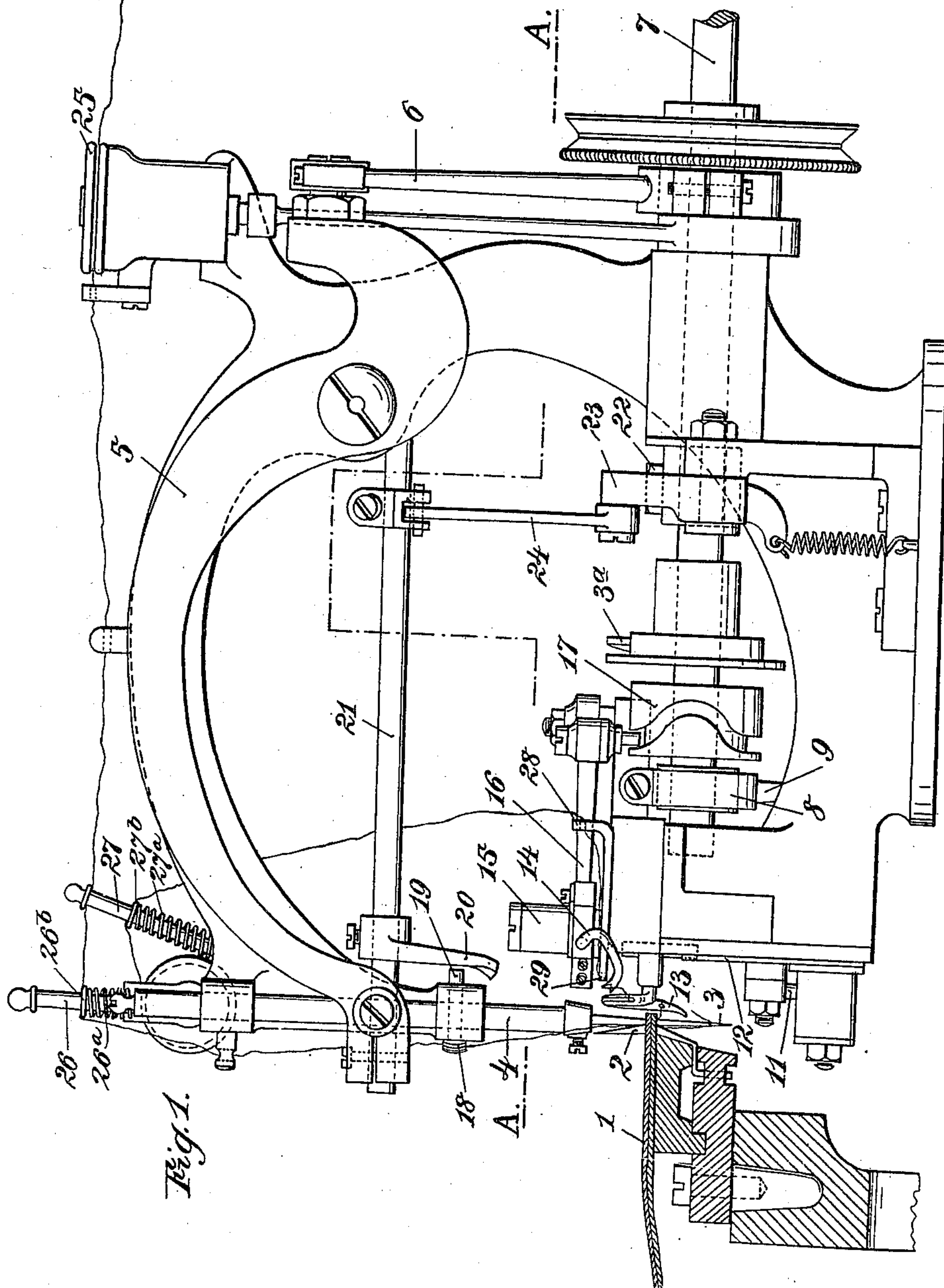


Fig. 1.

Witnesses.
Julius H. Lutz.
John Lotka

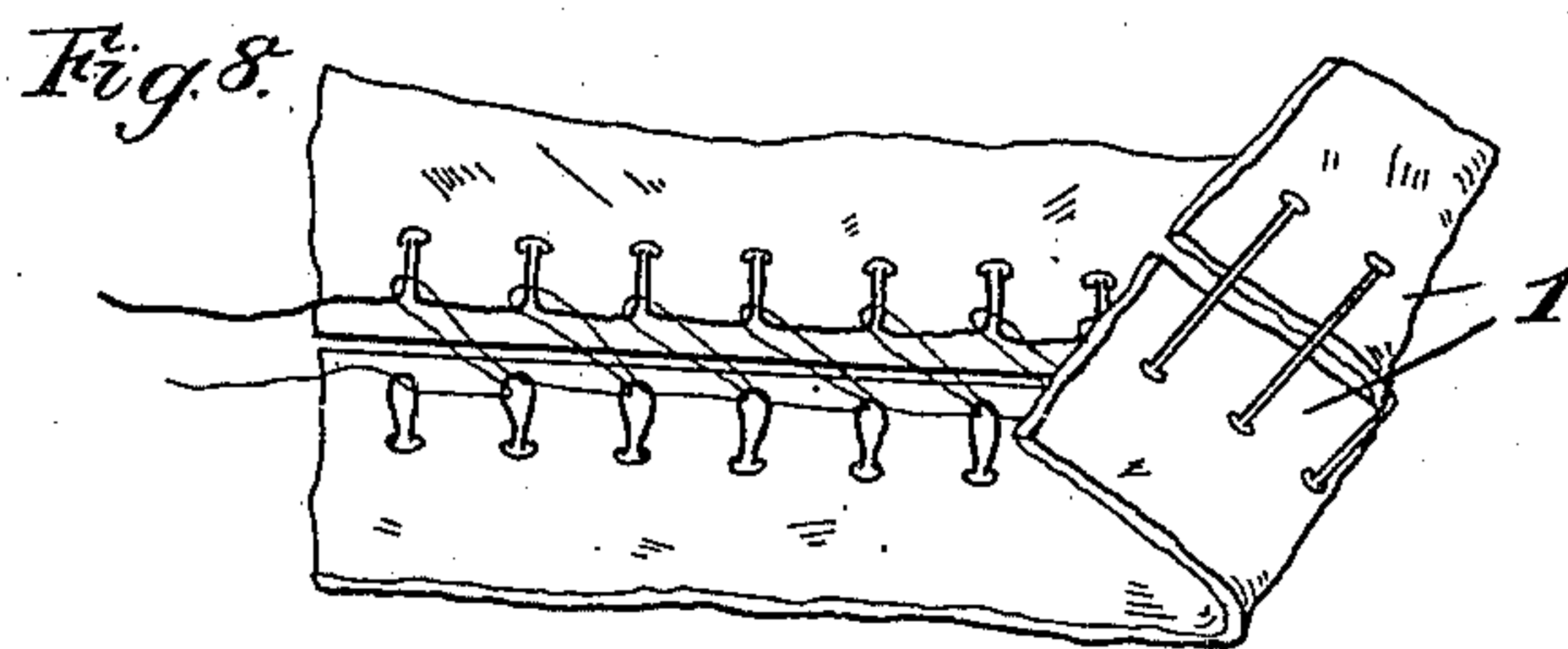
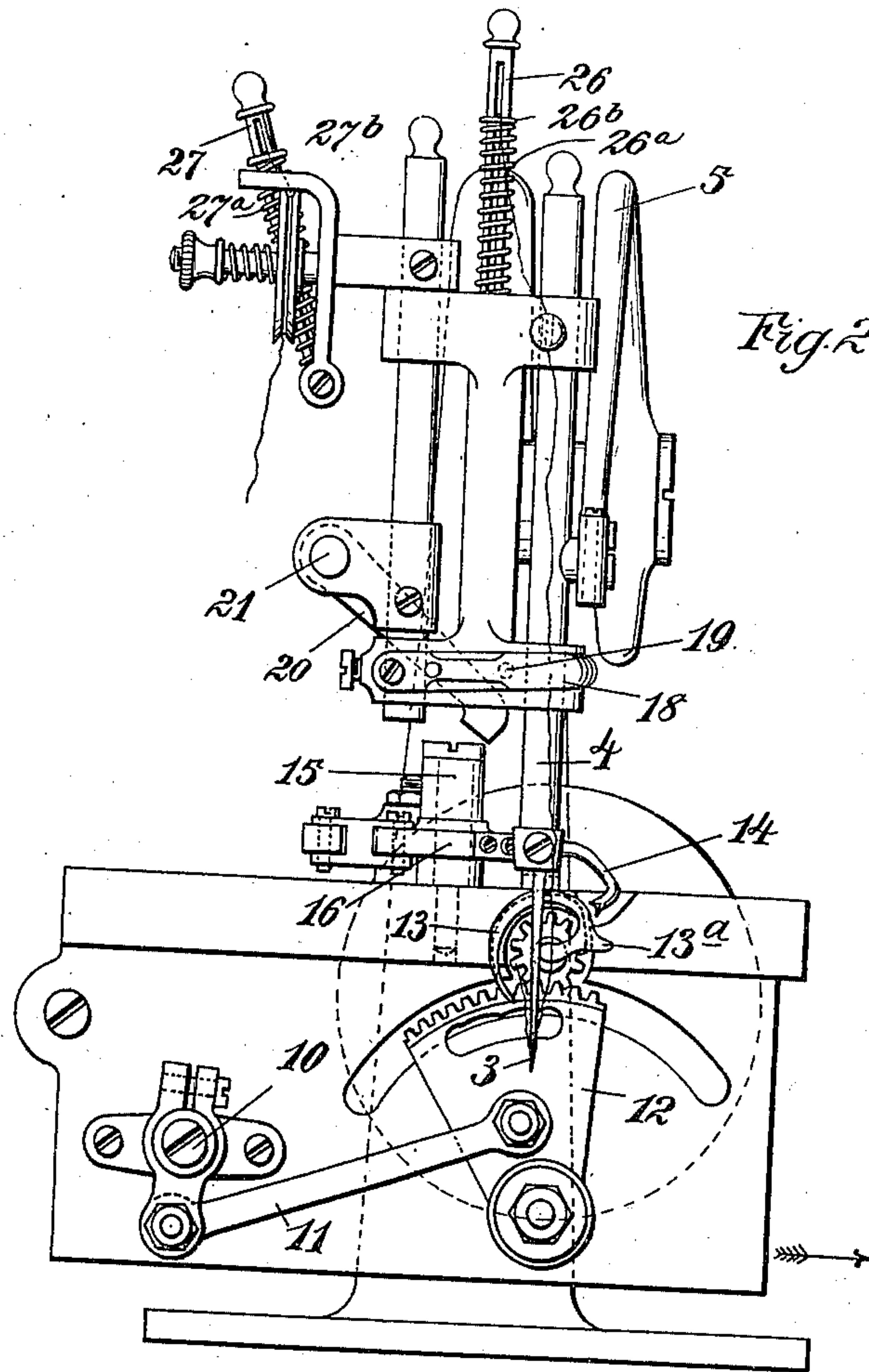
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John Lotka

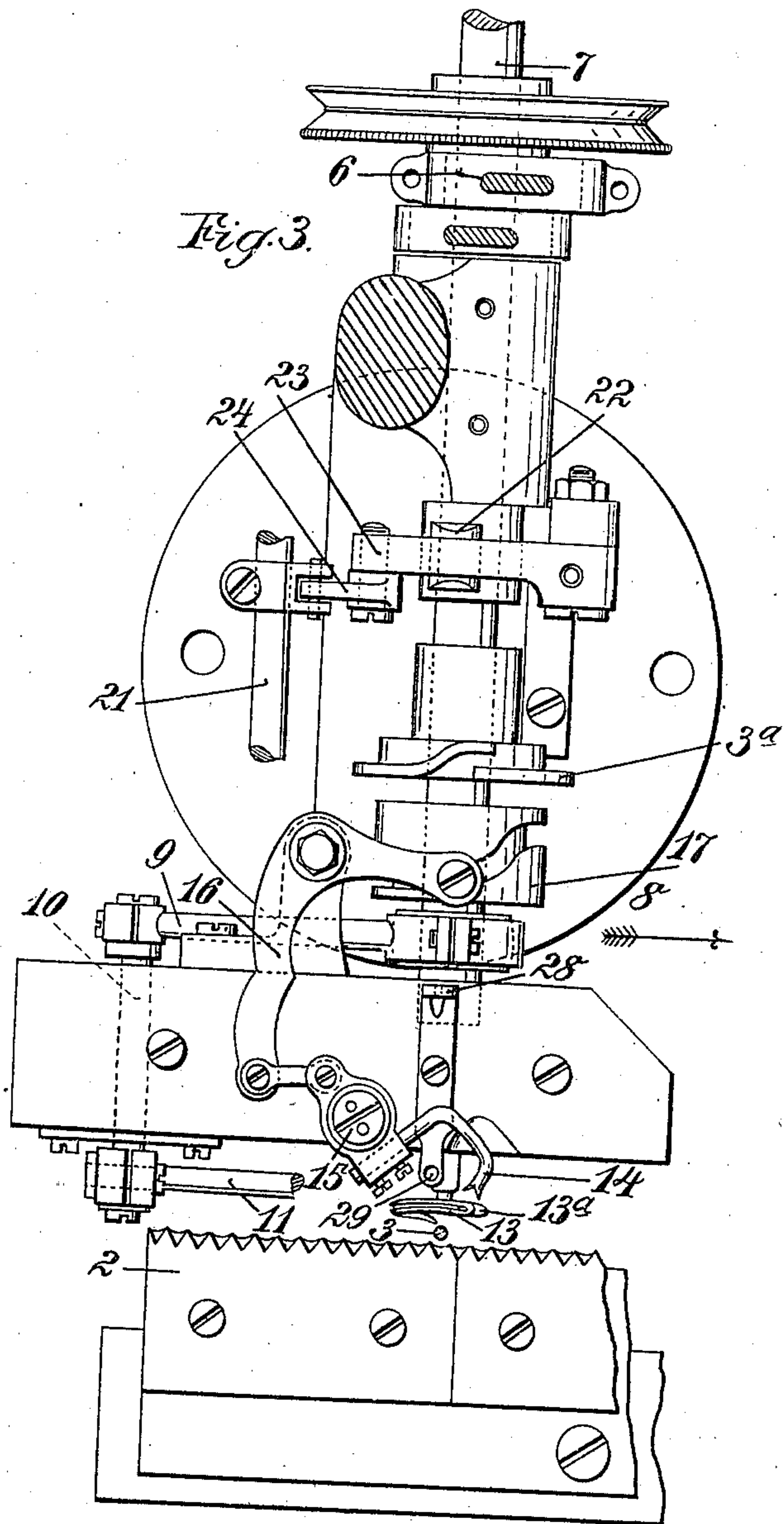
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Witnesses:
Julius H. Huber
John Lotka

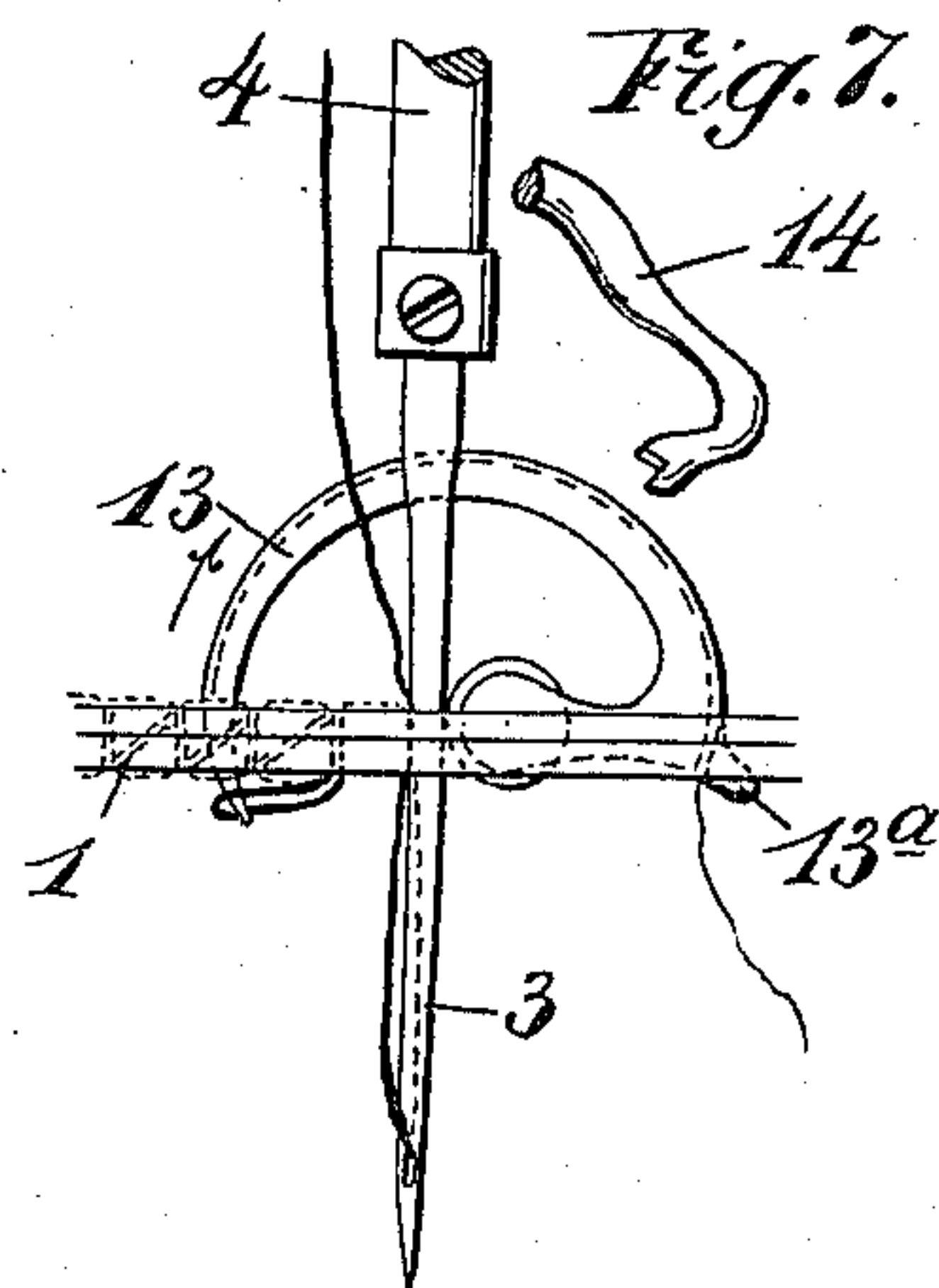
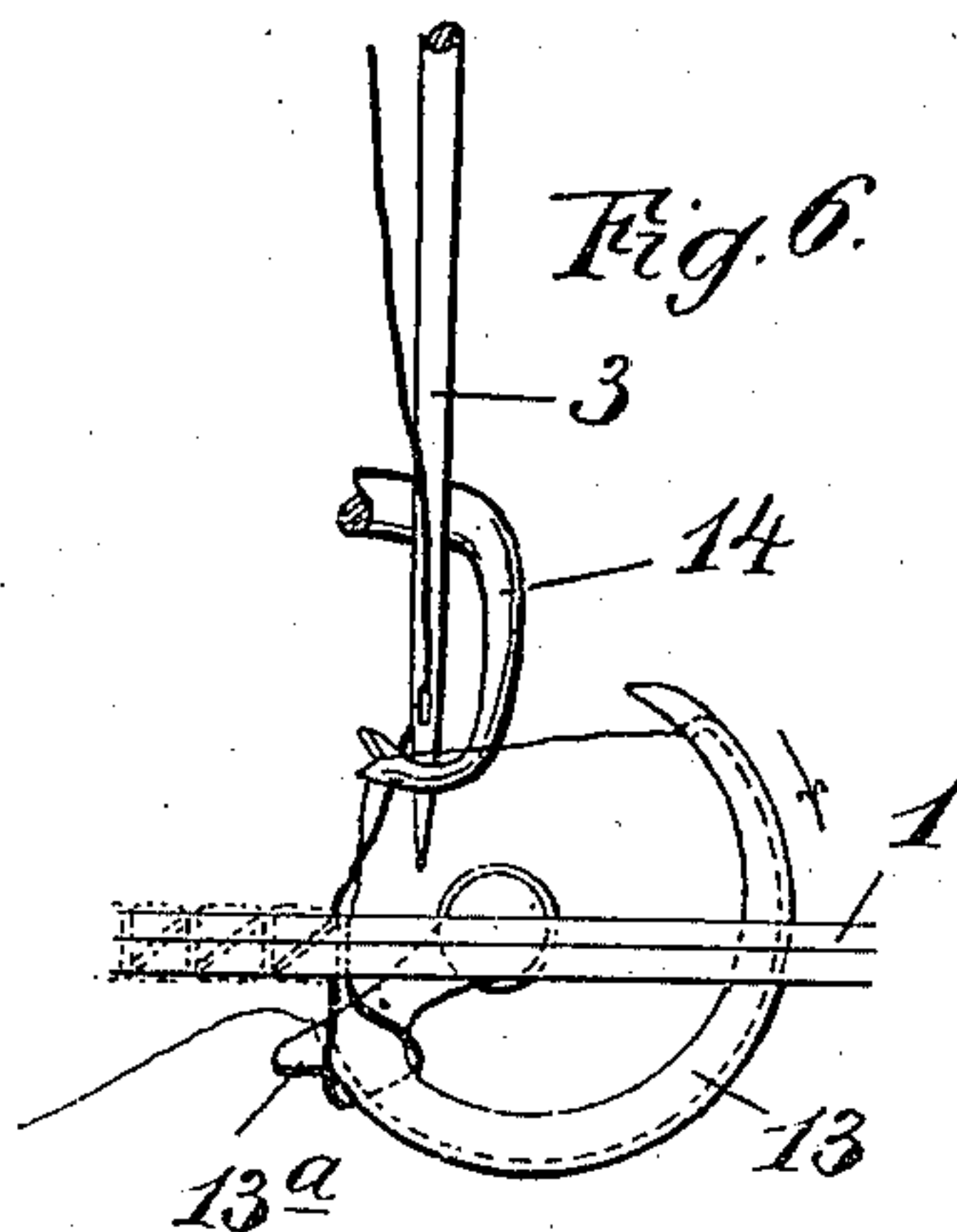
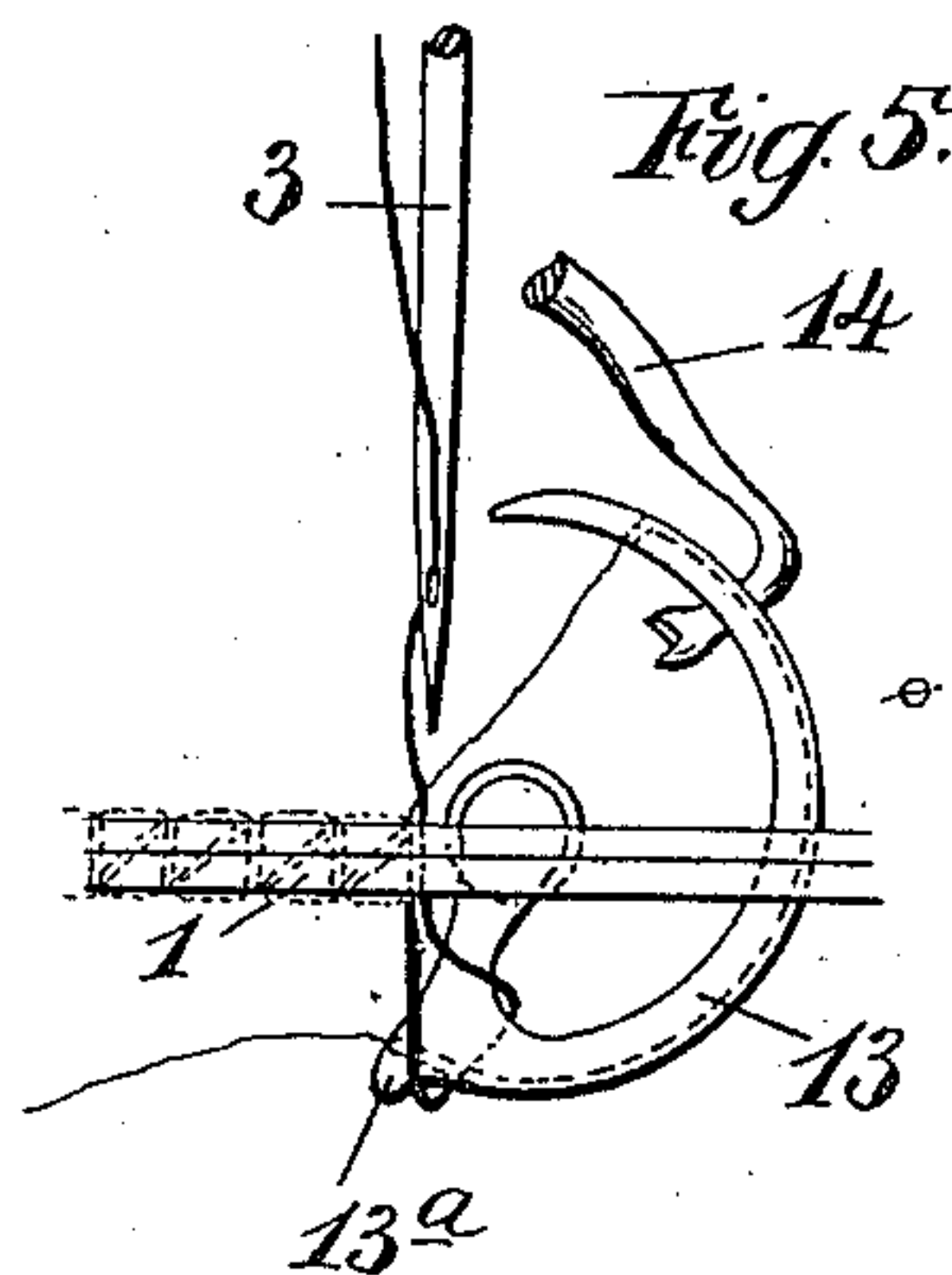
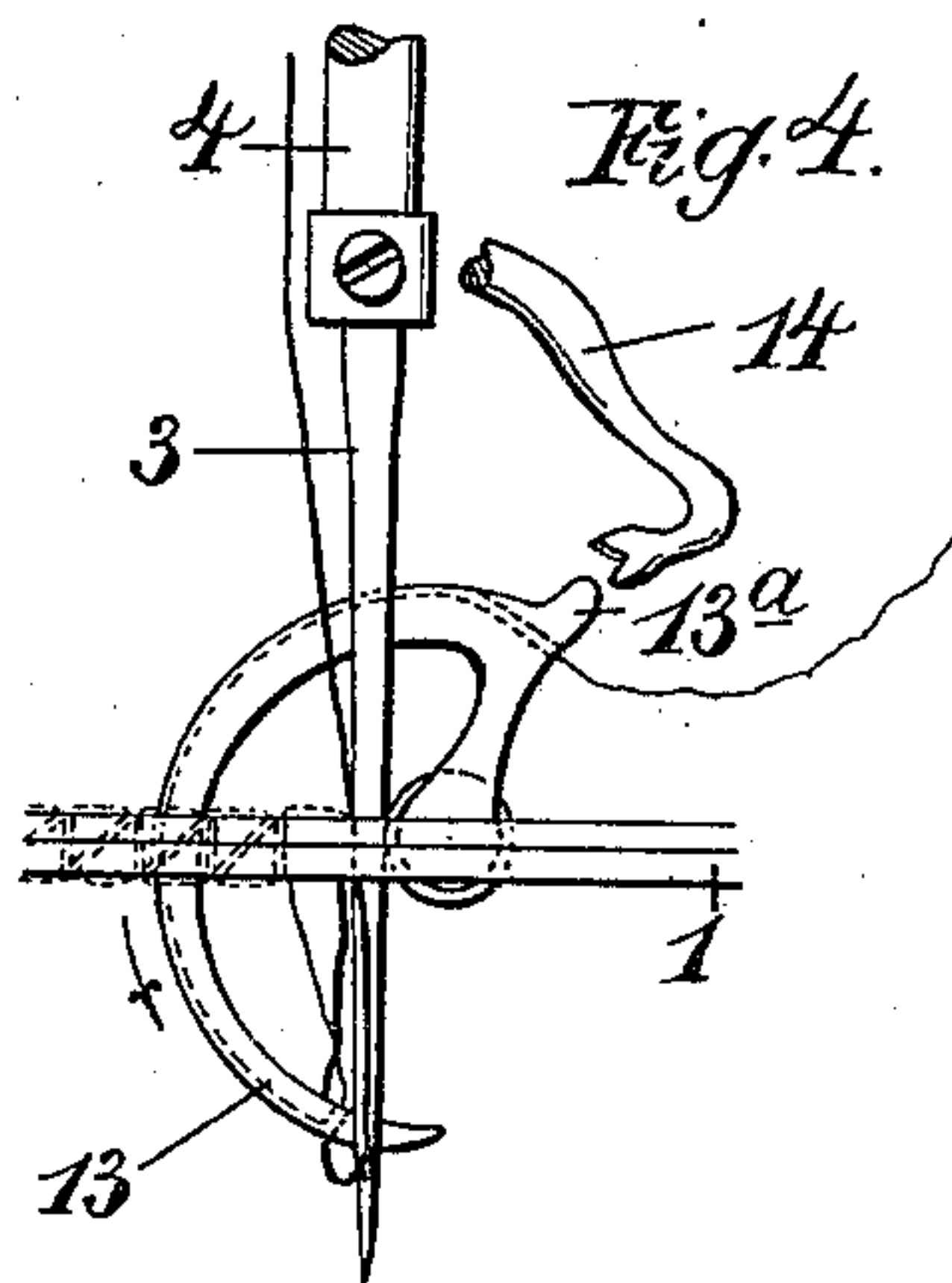
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5 SHEETS—SHEET 4.



Witnesses.
Julius H. Katz
John Lotka

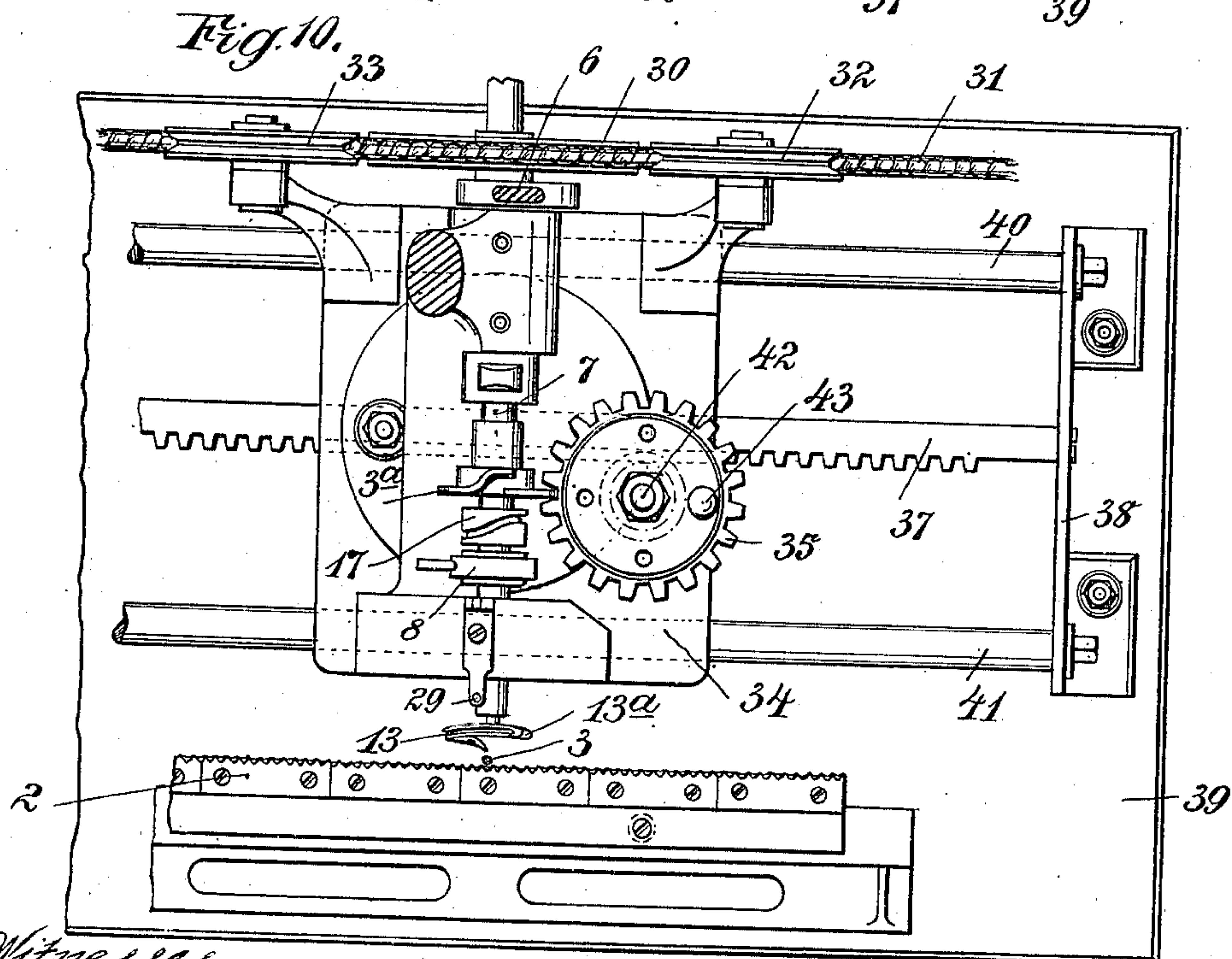
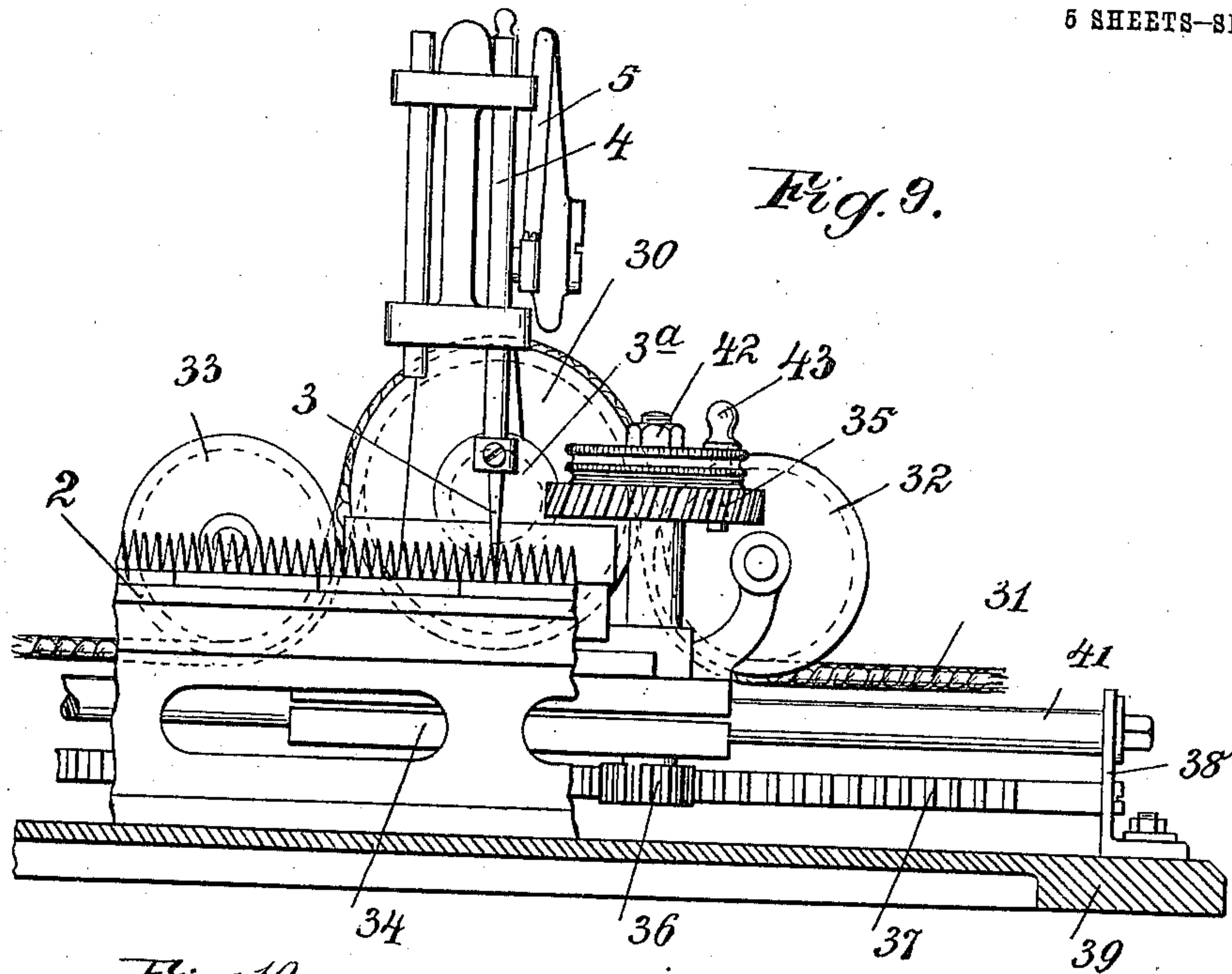
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5 SHEETS-SHEET 5.



Witnesses.
Julius H. Huber
John Lotka

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UNITED STATES PATENT OFFICE.

GEORG NIEDERMAYR, OF HATTERSHEIM-IN-THE-TAUNUS, GERMANY, ASSIGNOR TO
AARON VAIL ROWLEY, OF FRANKFORT-ON-THE-MAIN, GERMANY.

TWO-THREAD OVEREDGE SEWING-MACHINE.

974,910.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed December 28, 1904. Serial No. 238,642.

To all whom it may concern:

Be it known that I, GEORG NIEDERMAYR, engineer, residing at 1 Hofheimerstrasse, Hattersheim-in-the-Taunus, German Empire, have invented certain new and useful Improvements in Two-Thread Overedge Sewing-Machines, of which the following is a specification.

In over edge sewing machines with upper and under threads, as at present constructed, the sewing frame, or the sewing machine proper, is stationary, and the fabric is moved forward by the feed motion, with which arrangement a cloth presser is necessary. In this old construction, the stitch or seam is produced by means of a needle carrying the upper thread, a reciprocating threaded looper carrying the lower thread, and a spreader situated above the cloth, the arrangement being such that a nose situated near the point of the threaded looper carries the loop of the upper thread to the upper side of the cloth, while the spreader applies the thread of the threaded looper over the place through which the needle passes. With sewing machines arranged in this manner, with cloth presser and feed motion, the fabric is very easily distorted, and in particular when working rapidly, creases are formed in the fabric, so that the speed of sewing has to be comparatively small. According to the present invention these disadvantages are obviated by so constructing the mechanism of the sewing machine, that in forming the over-edge stitch the loop of the upper thread remains below the cloth, so that the known arrangement of sewing machines for other kinds of stitching can be utilized in which the cloth remains stationary and the sewing frame moves along the cloth and in which no cloth presser is required. The output of the sewing machine is, by this means, increased about four-fold that of the usual over-edge sewing machines, and a perfectly uniform and faultless seam is obtained. This result is obtained by employing in place of the before mentioned threaded looper with nose, a smooth threaded looper of circular curvature movable about an axis eccentric to its outline, and having a nose or projection at the rear end of the curved part near the pivot of said looper so that the looper needle can pass through the loop of the upper thread without carrying it upward.

A special arrangement of this sewing machine is rendered particularly applicable for knitted fabrics, by causing the upper thread before entering the eye of the needle, to pass through a clamping device which holds it during the time of forming the loop, as with knitted fabrics, the friction of the upper thread within the fabric is not sufficient for insuring a perfect loop formation.

I will describe my said invention with reference to the accompanying drawings, in which—

Figure 1 shows a side view of the sewing machine. Fig. 2 a front view, Fig. 3 a sectional plan on line A—A of Fig. 1, while Figs. 4, 5, 6 and 7 show to an enlarged scale the mode of forming the stitches, Fig. 8 shows the stitching or seam produced; Fig. 9 is a side elevation, with parts in section, illustrating chiefly the mechanism for moving the sewing frame; and Fig. 10 is a plan of the parts shown in Fig. 9.

The fabric 1 to be sewn is so placed upon the cloth plate 2 provided with vertical teeth, that the two edges to be sewn together are situated under the needle 3 of the sewing machine frame. The latter is arranged to slide parallel to the cloth plate in a guide in the direction of the arrow, its motion being made quicker or slower according to the size of the stitches to be produced.

The longitudinal motion of the sewing frame is effected along a toothed rack 37, situated parallel to the cloth plate 2, a toothed pinion 36 on the sewing frame being engaged with the said rack and being driven by means of a worm wheel 35 connected thereto, with which is engaged the driving worm 3^a carried by the sewing frame.

The rack 37 is secured to two cross bars 38 one of which is shown in Figs. 9 and 10, said bars being fastened to the frame or table 39, and being connected by rods 40, 41 which also serve as guides for the slide forming part of the sewing frame. In suitable bearings upon this movable frame, are journaled grooved rollers 30, 32, 33, engaged by a belt or rope 31 which travels to turn the wheel 30 and through it the shaft 7 on which said wheel is rigidly secured. The belt also engages two wheels (not shown) which are journaled on the stationary frame 39, the run which is engaged by the wheels 30, 32, 33, being substantially straight and parallel to the rack 37, as shown, so that the

wheel 30 may travel freely with the frame 34 and yet be driven by the rope or belt 31 at any point. In order that the machine may be stopped and brought back to its starting point, the worm wheel 35 is mounted loosely on the shaft 42 to which the pinion 36 is secured rigidly, and a coupling pin normally connects said shaft to rotate with the worm wheel 35. If, however, the pin 43 be lifted out of engagement with the worm wheel 35, the latter will rotate without actuating the shaft 42, and the operator can then turn the shaft 42 by hand in the opposite direction to bring the slide 34 and the parts carried thereby, back to their original position.

The needle 3 is carried by the needle bar 4, which is actuated by the elbow lever 5, and connecting rod 6 from the driving shaft 7. The latter carries an eccentric 8 which by means of connecting rod 9, crank shaft 10 and connecting rod 11 imparts a to-and-fro motion to a toothed sector 12, which in its turn imparts the requisite to-and-fro motion to the threaded looper 13 by means of a toothed pinion connected thereto.

The spreader 14, which is formed with a notch at its free end, is pivotally mounted on a vertical stud 15 and is actuated by means of an elbow lever 16, engaged with a cam drum 17 on the driving shaft. In addition, there is provided a thread-clamp 18, which holds the upper thread passing through it, when its pin 19 is actuated by means of the bent lever 20, mounted on a counter shaft 21, which receives a rocking motion from the main shaft by means of an arm or tappet 22 and levers 23 and 24. As the lever 20 rocks, its wedge-shaped end portion will at certain times engage the right-hand end of the pin 19 and force it against the spring 18 so as to relieve the pressure of said spring on the thread.

The upper thread passes from the thread reel through the tension disk 25, through the rod 26 fitted with a tension spring and through the thread clamp 18 into the eye of the needle 3, while the under thread passes from the reel over the rod 27 likewise fitted with a tension spring, and through the eyes 28 and 29 to the threaded looper 13. Each of the rods 26, 27, is slotted, as shown in Fig. 2, for the passage of the thread, and springs 26^a, 27^a, press upward against collars 26^b, 27^b sliding on the said rods. The thread is thus held under tension.

The threaded looper 13 is of a perfectly semi-circular form and is provided in the well-known manner with two eyes and a groove for the reception of the under thread. The center of said semicircle does not, however coincide with the looper's (horizontal) axis of oscillation, but the distance from said axis to the looper increases toward the free end of the looper. Owing to this eccentric

arrangement the looper exerts practically no upward pull on the loop of the needle thread and allows said loop to remain undisturbed. In addition the looper has at the rear end of the semicircle a nose 13^a, which prevents the loop of the upper thread from sliding off. The nose 13^a is located near the pivot of said looper and owing to this fact and to the spiral form of said looper (in edge view) the said nose does not exert a pull on, or, in other words, does not stretch the needle loop as is the case in constructions where the nose is located near the point of the looper. The danger of breaking the thread and of crumpling or of detaching the fabric from the fabric holding means is thus done away with.

The formation of the stitches by this machine is as follows:—When the needle 3 has pierced through the two cloth edges, there is formed on the upward motion thereof a loop of the upper thread below the cloth, into which loop the threaded looper 13 then enters as at Fig. 4. This loop remains below the cloth while the needle continues to ascend, and the threaded looper advances as shown at Fig. 5, the nose 13^a preventing the loop from sliding off the threaded looper. Before the needle again descends and the threaded looper moves back again, the spreader 14 passes by the threaded looper as at Fig. 6, seizes the lower thread, and spreads it out so that at the next stitch the under-thread passes around the needle. When the needle again passes below the fabric as at Fig. 7, the first-named loop of the upper thread slides off the point of the threaded looper, so that on the upward motion of the needle, a fresh loop is formed into which the threaded looper enters and thus the stitch formation is repeated. The peculiarity of the stitch formation therefore consists in that the loop of the upper thread always remains underneath the cloth, so that no cloth-presser is necessary, whereby the above-mentioned advantages are obtained.

The thread clamp 18 holds the upper thread during the first part of the upward motion of needle 3, so that the loop formation is not merely dependent upon the friction of the upper thread in the cloth, which friction would only be very small in the meshes of knitted goods and would not be sufficient for insuring the proper formation of the loop, particularly when working at great speed.

With knitted goods the material is so placed that the stitching is effected in the direction of its width, so that the needle can enter the meshes at the edge of the fabric.

The mechanism herein shown and described for moving the sewing frame is substantially the same as that disclosed in Neveux's Patent 786,833, of April 11, 1905, and I lay no claim to any of the specific features shown in said patent.

Now what I claim and desire to secure by Letters Patent is the following:

1. In a two-thread over-edge sewing machine, the combination of a toothed plate for holding the fabric, and a frame movable along the fabric, with sewing mechanism carried by said frame and comprising a needle arranged to form a thread loop, a threaded looper of circular curvature mounted to swing about an axis eccentric to its outline so as not to stretch the needle loop and provided with a nose adjacent to its pivot, and a spreader.
2. In a two-thread over-edge sewing machine, the combination of means for holding the fabric, and a frame movable along the fabric, with sewing mechanism carried by said frame and comprising a needle, a threaded looper of circular curvature mounted to swing about a horizontal axis transverse to the direction of travel of said frame and provided with a loop-retaining nose adjacent to its pivot, and a spreader mounted to oscillate about a vertical axis.
3. In a sewing machine the combination of a vertically reciprocating needle arranged to pierce the cloth and form a thread loop, an oscillating threaded looper of symmetrical circular curvature arranged to pass alternately above and below the cloth and provided with a loop-retaining nose adjacent to its pivot and a spreader which remains permanently above the cloth.
4. In a sewing machine the combination of a vertically reciprocating needle arranged to form a thread loop, a threaded looper of symmetrical circular curvature mounted to oscillate about an axis transverse to the direction in which the sewing progresses and provided with a loop retaining nose adjacent to its pivot and a movable spreader which remains permanently above the cloth.
5. In a sewing machine the combination

of a reciprocating needle arranged to form a thread loop, a symmetrically curved threaded looper arranged to oscillate adjacent to the needle and to pass above and below the cloth, said looper being provided with a loop-retaining nose adjacent to its pivot and a spreader to move above the cloth.

6. The combination in a sewing machine of a stationary frame having means for holding the work and a movable frame arranged to travel lengthwise of the workholder, a needle, a symmetrically curved threaded looper and a spreader carried by said movable frame, the needle being arranged to reciprocate up and down, the threaded looper to oscillate about an axis transverse to the direction of travel of said frame and being provided adjacent to its pivot with a loop-retaining nose and the spreader being arranged to oscillate above the cloth.

7. The combination, in a sewing machine, of a stationary frame having means for holding the work, and a movable frame arranged to travel lengthwise of the workholder, a needle, a threaded looper, and a spreader carried by said movable frame, the needle being arranged to reciprocate up and down through the fabric, the threaded looper to oscillate about an axis transverse to the direction of the frame's travel, and the spreader being arranged to oscillate above the cloth about a vertical axis.

In testimony, that I claim the foregoing as my invention I have signed my name in presence of two witnesses, this seventh day of December 1904.

GEORG NIEDERMAYR.

Witnesses:

EVA SATTLER,
CARL WERKE.