

No. 622,337

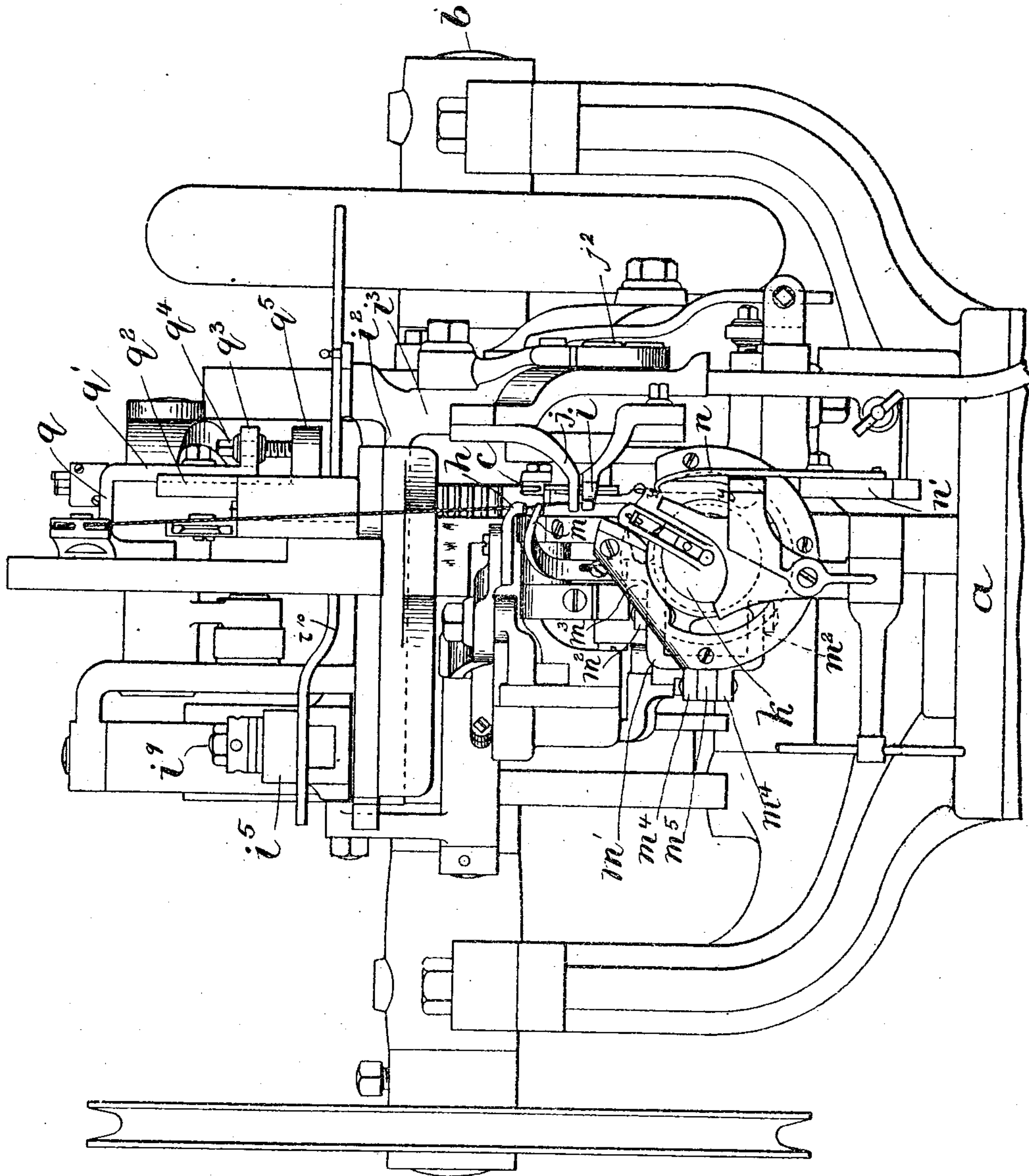
A. EPPLER, JR.
SEWING MACHINE.

Patented Apr. 4, 1899.

(No Model.)

(Application filed Feb. 21, 1898.)

3 Sheets—Sheet 1.



15

WITNESSES:

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25

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5 Sheets—Sheet 2.

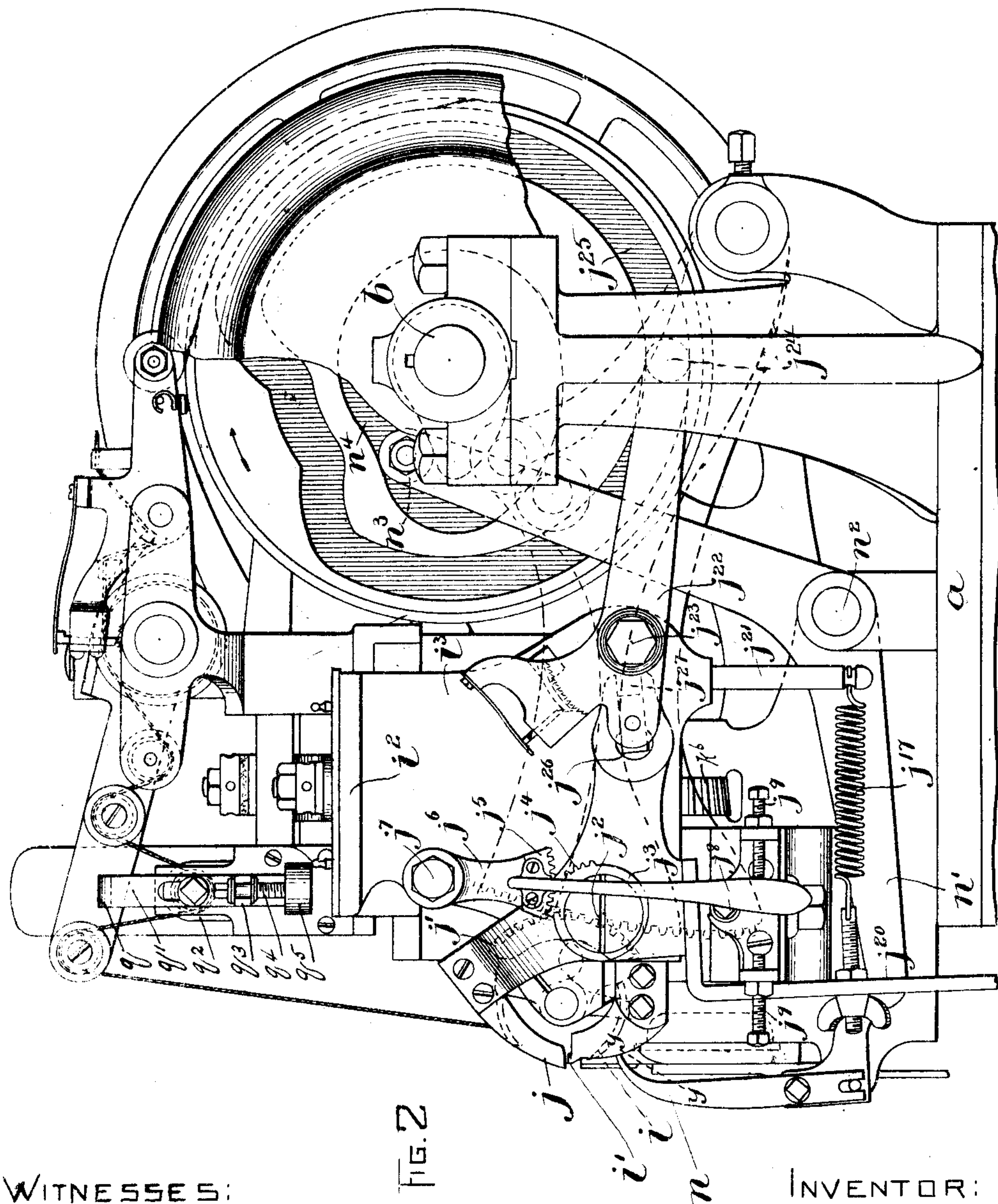


FIG. 2

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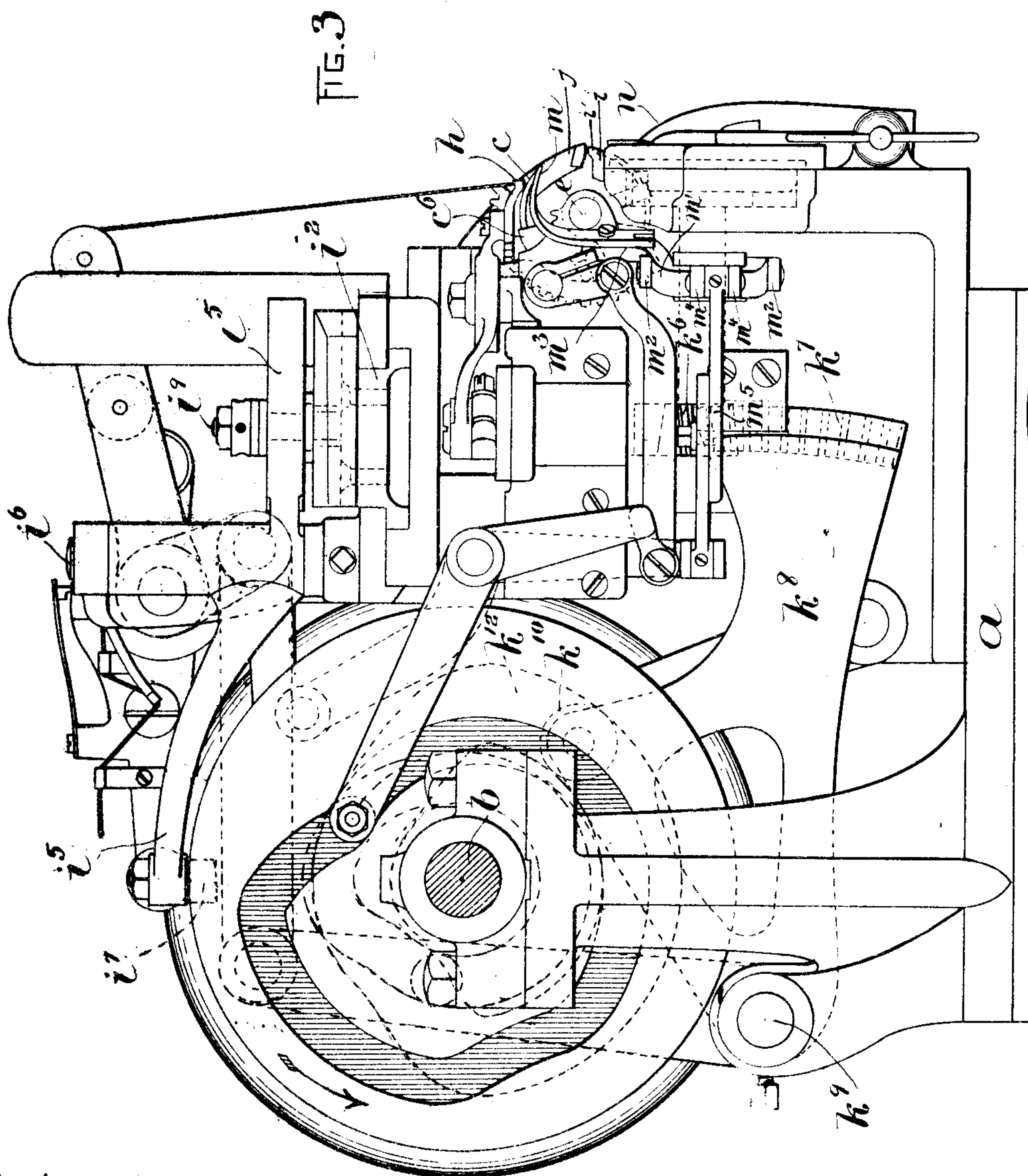
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5 Sheets—Sheet 3.



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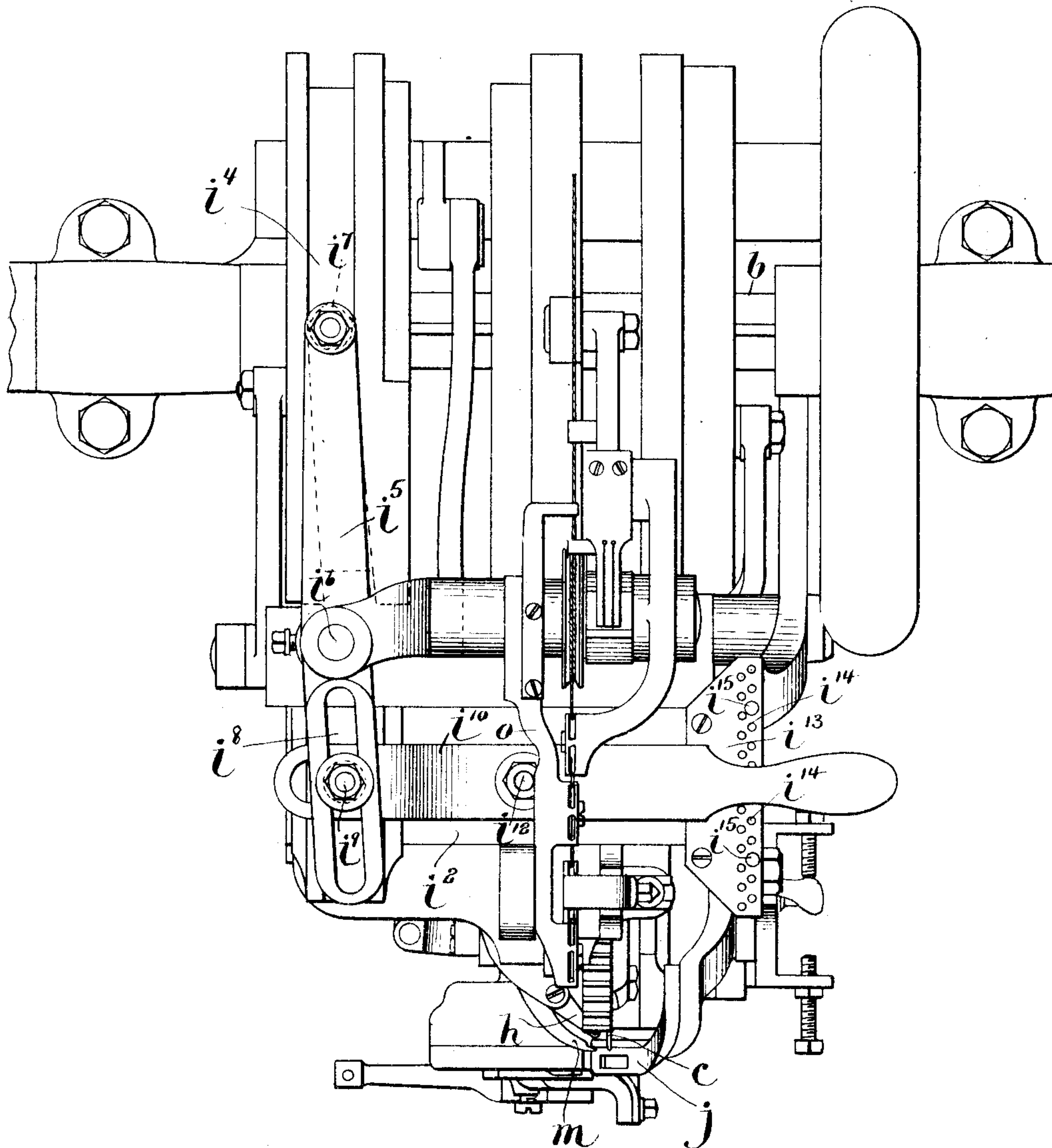
A. EPPLER, JR.
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(Application filed Feb. 21, 1898.)

(No Model.)

5 Sheets—Sheet 4.

FIG. 4.



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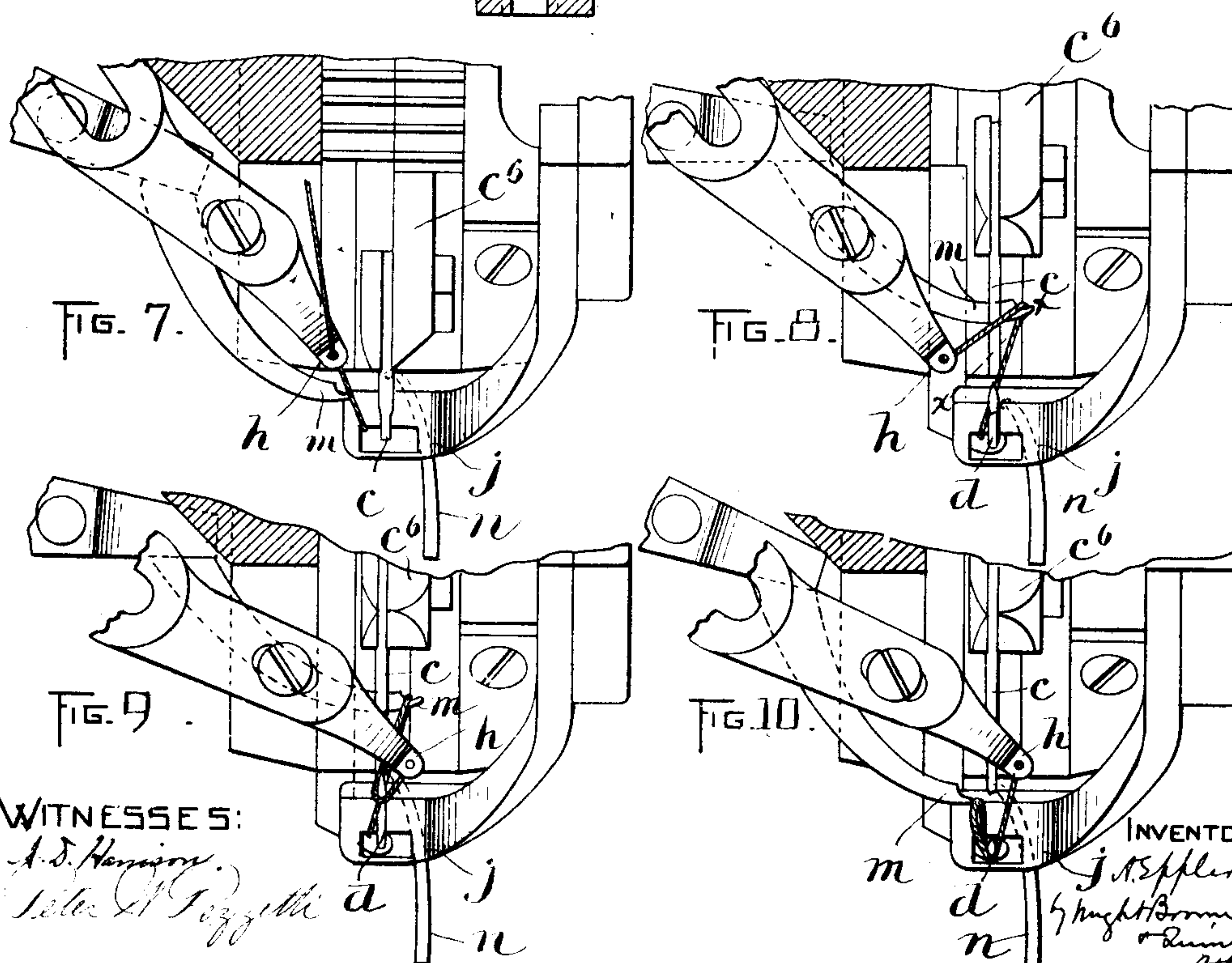
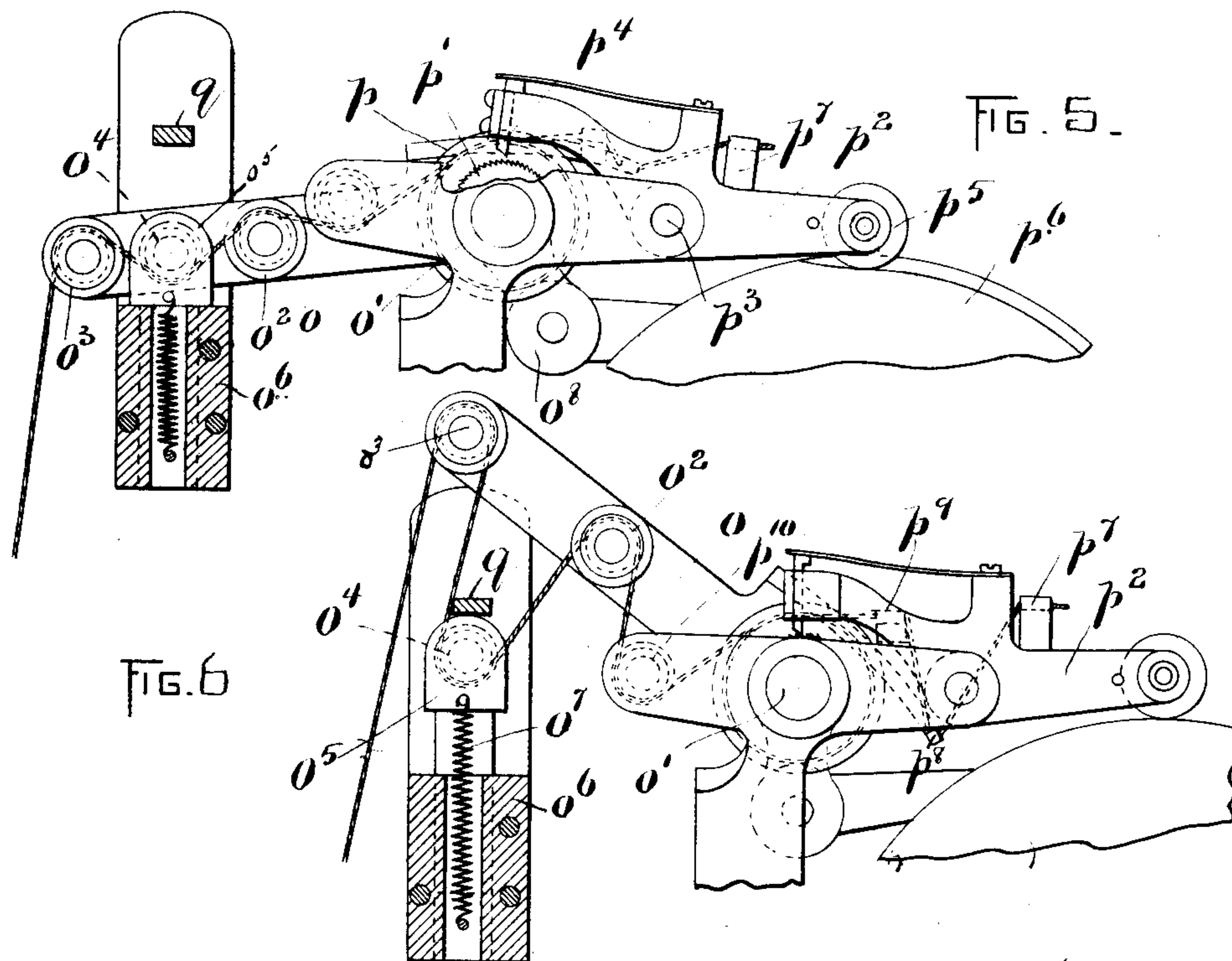
Patented Apr. 4, 1899.

A. EPPLER, JR.
SEWING MACHINE.

(Application filed Feb. 21, 1898.)

(No Model.)

5 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

ANDREW EPPLER, JR., OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
EPPLER WELT MACHINE COMPANY, OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 622,337, dated April 4, 1899.

Application filed February 21, 1898. Serial No. 571,048. (No model.)

to all whom it may concern:

Be it known that I, ANDREW EPPLER, JR., of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

This invention relates to a curved-needle double-thread sewing-machine of the type shown in Letters Patent of the United States No. 533,639, such machine being adapted for stitching outer soles to welts of welted boots and shoes.

The invention has for its object to provide certain improvements in a machine of this character with a view of increasing its usefulness and efficiency.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a sewing-machine embodying my invention. Fig. 2 represents a side elevation of the same. Fig. 3 represents an elevation from the side opposite that shown in Fig. 2. Fig. 4 represents a top plan view. Figs. 5 and 6 represent views of parts of the machine and illustrating the take-up device. Figs. 7, 8, 9, and 10 are plan views of parts of the machine, illustrating the operation of the thread finger and looper.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents the supporting-frame, having bearings for the driving-shaft *b*, which is provided with a series of operating-cams and disks having cam-grooves adapted to give motion to the various parts of the machine.

c represents the curved awl, and *d* the curved needle. Said awl and needle are affixed to arms which oscillate on a fixed stud *e*, the awl and needle being in the same plane and neither having any lateral movement, so that when they are oscillated the awl follows the needle, and vice versa, as in the machine set forth in said Letters Patent No. 533,639. The mechanism for operating the awl and needle may be as shown in said patent, to which ref-

erence may be had for a description of said mechanism.

h represents the looper, which presents the upper thread to the needle and is operated in the manner and preferably by the mechanism described in said patent.

i represents the work-supporting channel-guide, which is preferably provided with a protuberance *i'*, Fig. 2, adapted to enter the channel in the under surface of the outer sole of a welted shoe, said support being arranged to cooperate with the presser-foot *j* in holding the work in the path of the awl and needle. The channel-guide and presser-foot have a back-and-forth motion across the path of the needle, so that they feed the work as described in the said Patent No. 533,639. I have, however, improved the mechanism for imparting the back-and-forth movements to said parts by substituting for the oscillating head or holder, shown in said patent as the carrier for the channel-guide and presser-foot, a slide *k*, movable horizontally in guides on the frame of the machine and provided at one end with a vertical flange *k'*, to which the channel-guide *i* is rigidly secured, the presser-foot *j* being attached to a lever *l*, mounted to oscillate on a stud *l'*, affixed to said flange. The slide *k* is reciprocated by means of a cam-groove *m* in a disk on the driving-shaft and a lever *n*, mounted to oscillate on a fixed vertical stud *n'*, one arm of said lever having a trundle-roller *o* entering said cam-groove, while the other arm has a stud *n''*, which connects the lever with a link-lever *p*, pivoted at *p'* to the slide *k*. The channel-guide and presser-foot are therefore given a rectilinear back-and-forth movement instead of an oscillatory movement, so that they feed the work more advantageously. The link-lever *p* is preferably adapted to swing on its pivot *p'* to adjust the stud *n''* in a slot *q* in the lever *n*, thus varying the length of the feed movement imparted to the slide. A plate *r* is affixed to the frame under an extension of the link-lever *p* and has a series of orifices *r'*. Stop-pins *s* and *s'* are inserted in two of said holes at opposite sides of the outer end of the link-lever and limit the swinging movements of the latter.

The presser-foot is given up-and-down movements, so that it alternately grasps and releases the work and is pressed yieldingly toward the channel-guide during the backward movement, as described in the above-mentioned patent. The details of the presser-foot operating mechanism here shown (see Fig. 2) differ from those shown in the said patent, but operate in the same way. They comprise a holding-down spring j^{17} , adjustably secured at one end to an arm j^{20} on the lever j' and attached at the other end to a pin j^{21} on the slide-flange i^3 , a lever j^{22} , mounted to oscillate on a stud j^{23} on the said flange, said lever having at one end a pivoted block j^{26} , engaged with a slot j^{27} in the lever j' , and a cam-groove j^{25} in a disk on the driving-shaft, receiving a trundle-roll j^{24} on the other end of the lever j^{22} . The presser-foot serves as a guide to bear against a lasted shoe and is movable in and out to vary the distance of the stitches from the upper of the shoe by means of a loose eccentric collar j^3 on the stud j^2 , said collar constituting the bearing for the lever j' . The collar may be partially rotated to vary the position of the presser-foot by means of an arm j^6 , pivoted at j^7 to the flange i^3 and having a gear-segment j^5 , meshing with a gear-segment j^4 on the collar j^3 . A handle j^8 , affixed to the arm j^6 , plays between adjustable stops j^9 .

k represents the oscillating shuttle, which may be of the form shown in Patent No. 533,639, and is mounted in a suitable carrier on a shaft k^5 , which is oscillated by suitable connections with the driving-shaft, said connections, as here shown, comprising a bevel-gear k^6 , affixed to the shaft, and a gear-segment k^7 (shown in dotted lines in Fig. 3) on a lever k^8 , which is pivoted at k^9 and has a trundle-roll k^{10} entering a cam-groove k^{12} . The shuttle oscillates in a plane at right angles to the plane of the needle and cooperates with the needle in forming the stitches in the manner described in the above-mentioned patent, the shuttle being, however, preferably in a vertical plane instead of being inclined, as shown in said patent.

m represents a thread-finger which is adapted to engage the needle-thread at one side of the path of the needle, as shown in Fig. 7, and to move diagonally across the path of the needle, as indicated by the dotted line xx in Fig. 8, thus carrying the thread across the needle-path and holding it while the looper moves from the position shown in Figs. 7 and 8 to that shown in Fig. 9, the finger remaining in its thread-holding position until the needle engages the bight of thread and then returning to its starting-point and releasing the thread, as shown in Fig. 10.

The means here shown for oscillating the finger m comprise a yoke m' , Figs. 1 and 3, pivoted to fixed ears m^2 m^2 and provided with an arm m^3 , to which the finger m is attached. The yoke has ears m^4 m^4 , to which a connecting-rod m^5 is pivoted, said rod being con-

nected with a lever which is oscillated by a cam-groove. The center of oscillation of the finger m is in the ears m^2 m^2 .

The described diagonal movement of the thread-finger across the path of the needle enables the finger to cooperate with the looper in supplying loose thread to the needle between the work and the needle in such manner that the bight of thread nearly surrounds the needle while the barb is engaging it, as shown in Fig. 9. The engagement of the needle with the thread is thus rendered more certain than it would be if the thread-finger did not thus cross the needle-path, and the looper is enabled to accomplish its function by a shorter movement than heretofore.

n represents a thread-dividing finger, which enters the needle-loop and holds it in position to receive the point of the shuttle. Said finger is affixed to a lever n' , Fig. 2, which is pivoted at n^2 to a fixed support and has a trundle-roll n^3 entering a cam-groove n^4 . The arrangement is such that the thread-engaging end of the finger n moves diagonally across the path of the point of the shuttle, as indicated by the dotted line yy , Figs. 1 and 2, without intersecting or coming within said path, so that there is no liability of contact between the finger and the shuttle.

The machine has an auxiliary take-up which comprises an arm o , affixed to a rock-shaft o' and provided with sheaves o^2 o^3 , which are separated by a space adapted to receive a sheave o^4 , which is journaled in a slide o^5 . Said slide is vertically movable in a fixed guide o^6 and is held down yieldingly by a spring o^7 . The arm o is oscillated vertically by means of an arm o^8 , affixed to the rock-shaft o' , and suitable connections between said arm o^8 and the driving-shaft. A tension-wheel p is mounted to rotate loosely on the rock-shaft o' and has a ratchet p' affixed to it. A lever p^2 , pivoted at p^3 to a fixed support, has at one end a spring-pressed dog p^4 , adapted to engage the ratchet and lock the tension-wheel. The other end of the lever p^2 has a trundle-roll p^5 bearing on a cam p^6 on the driving-shaft, said cam being formed to alternately raise the dog p^4 , as shown in Fig. 5, and depress the same, as shown in Fig. 6, thus locking the tension-wheel.

The thread passes from the source of supply first through a guide p^7 on the lever p^2 , then through a guide p^8 on the arm o , then through another guide p^9 on the lever p^2 , then around the tension-wheel p , and then under a sheave p^{10} on a fixed support to the sheave o^2 , from whence it passes under the sheave o^4 and over the sheave o^3 to the looper. When the arm o is depressed, the yielding sheave o^4 is held by its spring in the position shown in Fig. 5, and when said arm is raised the sheave o^4 yields until the slide o^5 strikes a stop q , which is vertically adjustable on the frame of the machine. When the sheave o^4 is thus arrested, the stitch is set, the tension-wheel having been previously locked. The

point at which the thread is locked in the work is therefore determined by the position of the adjustable stop q . Said stop is formed on a slide q' , movable vertically in a fixed guide q^2 and provided with an ear q^3 , in which is journaled a rod q^4 , the lower portion of which is screw-threaded and engaged with a threaded socket in a fixed ear q^5 , the rotation of the rod adjusting the stop q .

It will be seen that the take-up is composed of two sections, the arm o with its attachments constituting a positively-operated section, while the slide o^5 and sheave o^4 constitute a yielding section.

The operation is as follows: The edge of the shoe-bottom is inserted between the channel-guide and presser-foot, and after the formation of each stitch the guide and foot move to the left, as viewed in Fig. 1, feeding the shoe before the awl advances to penetrate the work. At the end of the feed movement the awl pierces the material and the presser-foot then rises and moves back with the channel-guide while the awl is in the material. The awl then retracts and the needle follows it through the same hole. While the needle is advancing the thread-finger m moves diagonally inward, taking thread from the supply end and holding the thread behind the needle. Then the looper moves partly around the needle, the finger and looper forming a long bight, nearly encircling the needle and insuring its engagement with the barb of the needle. The take-up then releases the thread and the needle is retracted, the thread-finger at the same time swinging outward and dropping the loop, the finger swinging out of the plane of the needle and awl. The thread-dividing finger n then engages the loop and carries it into the path of the point of the shuttle, so that the shuttle can enter and pass through said loop in the usual manner, the thread-divider moving diagonally across the plane of the path of the point of the shuttle without intersecting said path, so that said thread-divider cannot strike the shuttle. The shuttle takes the loop while the divider is

rising. When the shuttle has carried the thread to the lowest point, the tension locking device locks the thread, the locking taking place just before the take-up rises and before the needle commences to retract. The take-up then rises and sets the stitch, the point at which the threads are interlocked in the material being determined by the position of the adjustable stop q , as above stated.

I claim—

1. In a sewing-machine of the character specified, the combination with a curved needle and a curved awl both oscillating in a constant given path, of a looper and suitable cooperating parts, and a slack-forming thread-finger, as m , movable in a single horizontal plane diagonally across the path of the needle, said finger being arranged to draw off the needle-thread between the needle and the work to aid in forming a bight of slack thread between the work and the needle.

2. In a lock-stitch sewing-machine, the combination with the reciprocating curved needle, and a shuttle, and suitable cooperating parts, of a take-up comprising a positively-operated thread-drawing section and a yielding thread-drawing section, and an adjustable stop for said yielding section, whereby the lock of the threads may be located at any desired point in the thickness of the material.

3. In a lock-stitch sewing-machine of the character specified, the combination with the reciprocating curved needle and a shuttle, and suitable cooperating parts, of a take-up comprising a positively-operated arm o provided with sheaves o^2 o^3 , a slide having a sheave o^4 , a spring for exerting a yielding downward pull on the slide, and an adjustable stop for limiting the upward movement of the slide.

In testimony whereof I have affixed my signature in presence of two witnesses.

ANDREW EPPLER, JR.

Witnesses:

MARCUS B. MAY,
A. D. HARRISON.