

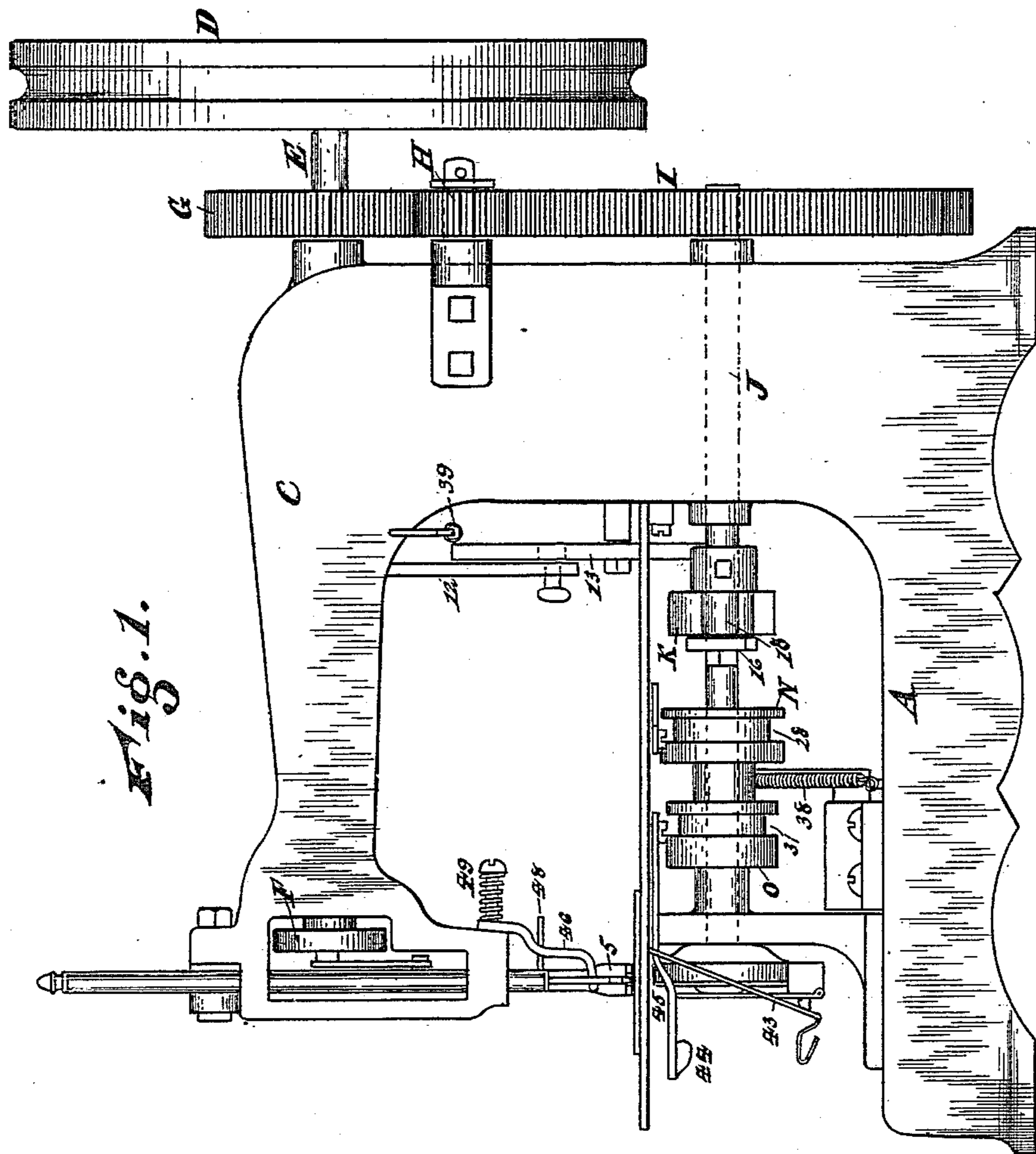
(No Model.)

5 Sheets—Sheet 1.

L. L. MILLER.
SEWING MACHINE.

No. 424,490.

Patented Apr. 1, 1890.



Attest

Walter Sims
T. Simmons

Inventor

Louis L. Miller.

By Wood & Bond
his Attorneys re

(No Model.)

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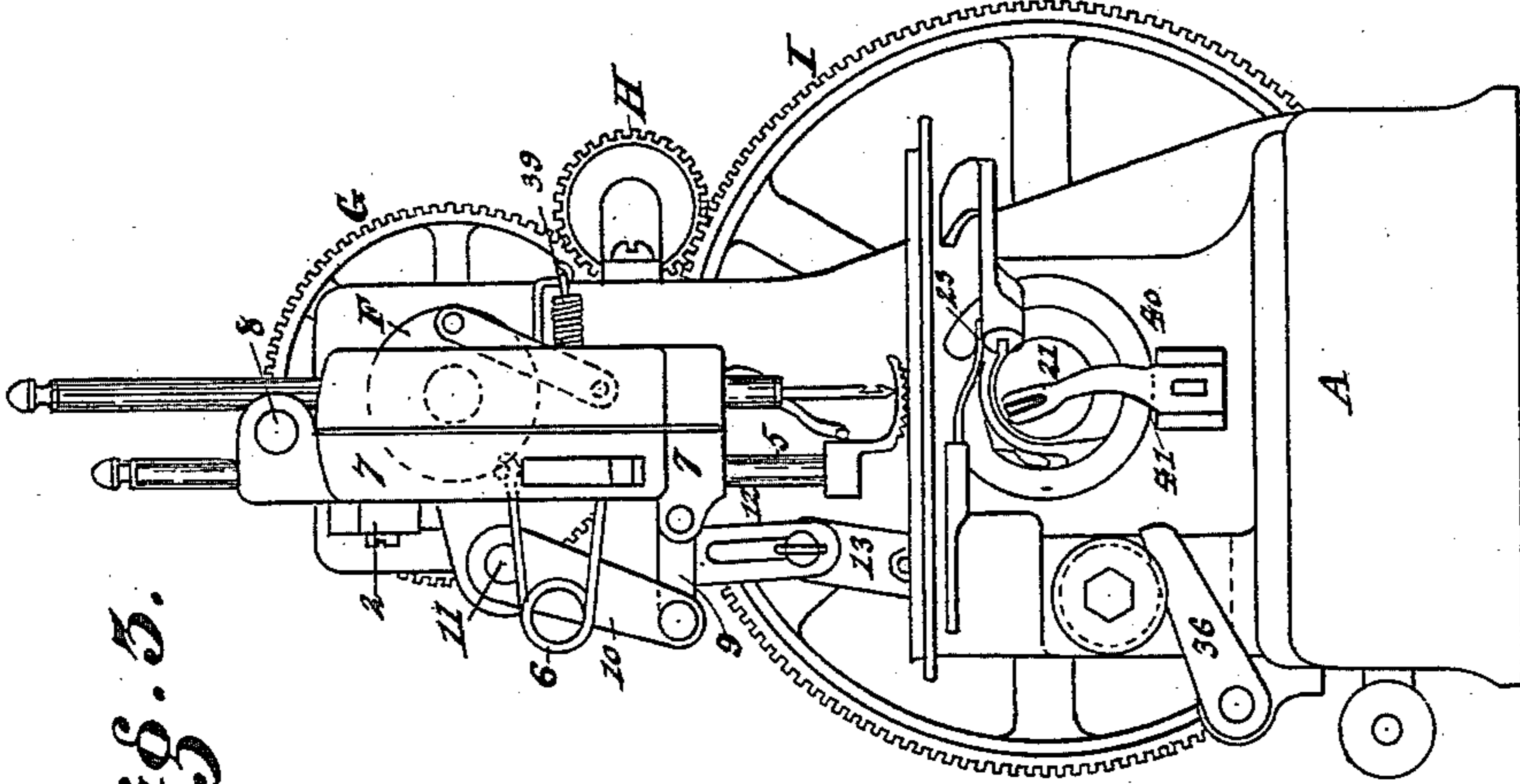


Fig. 3.

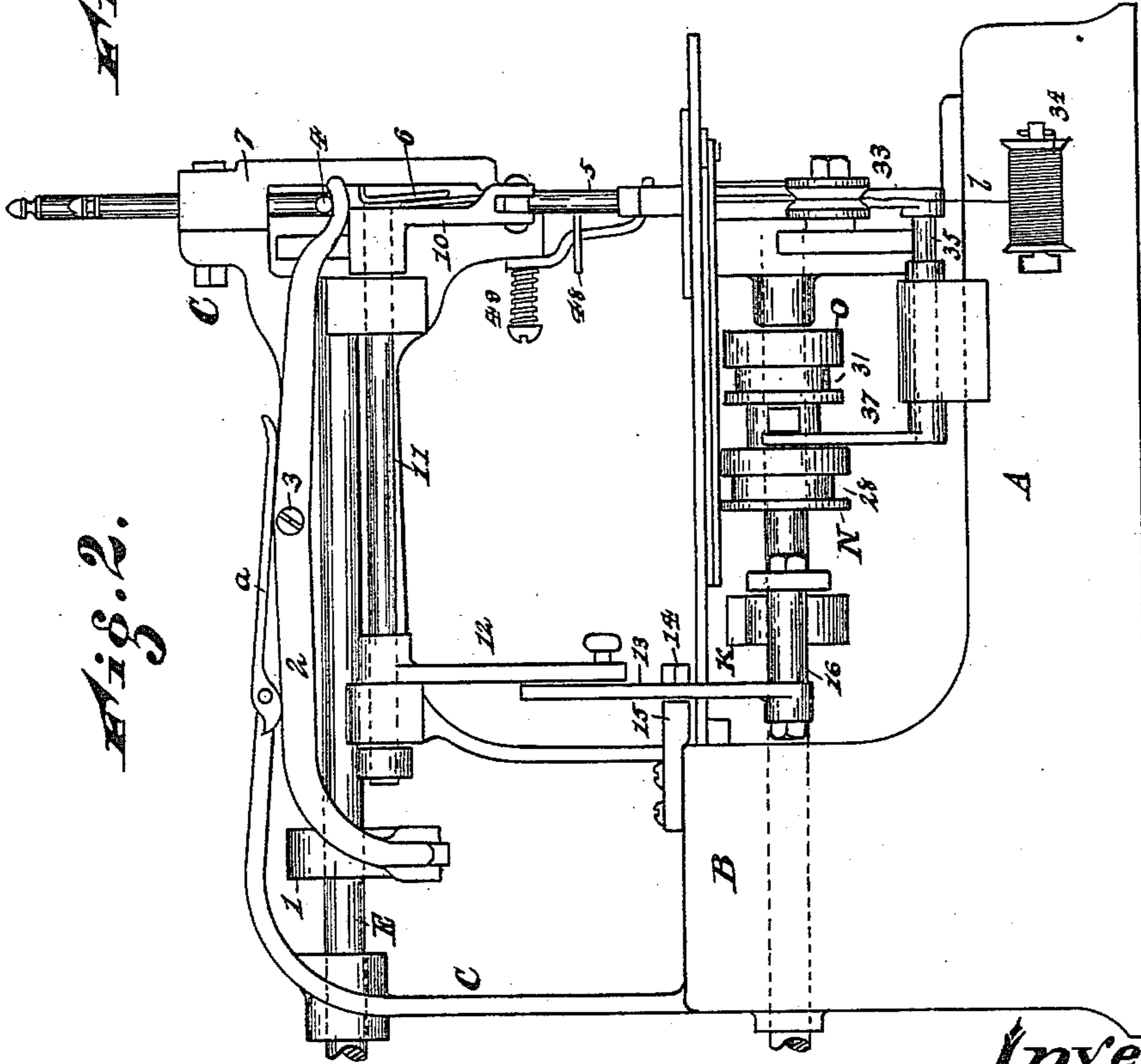


Fig. 2.

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Fig. 4.

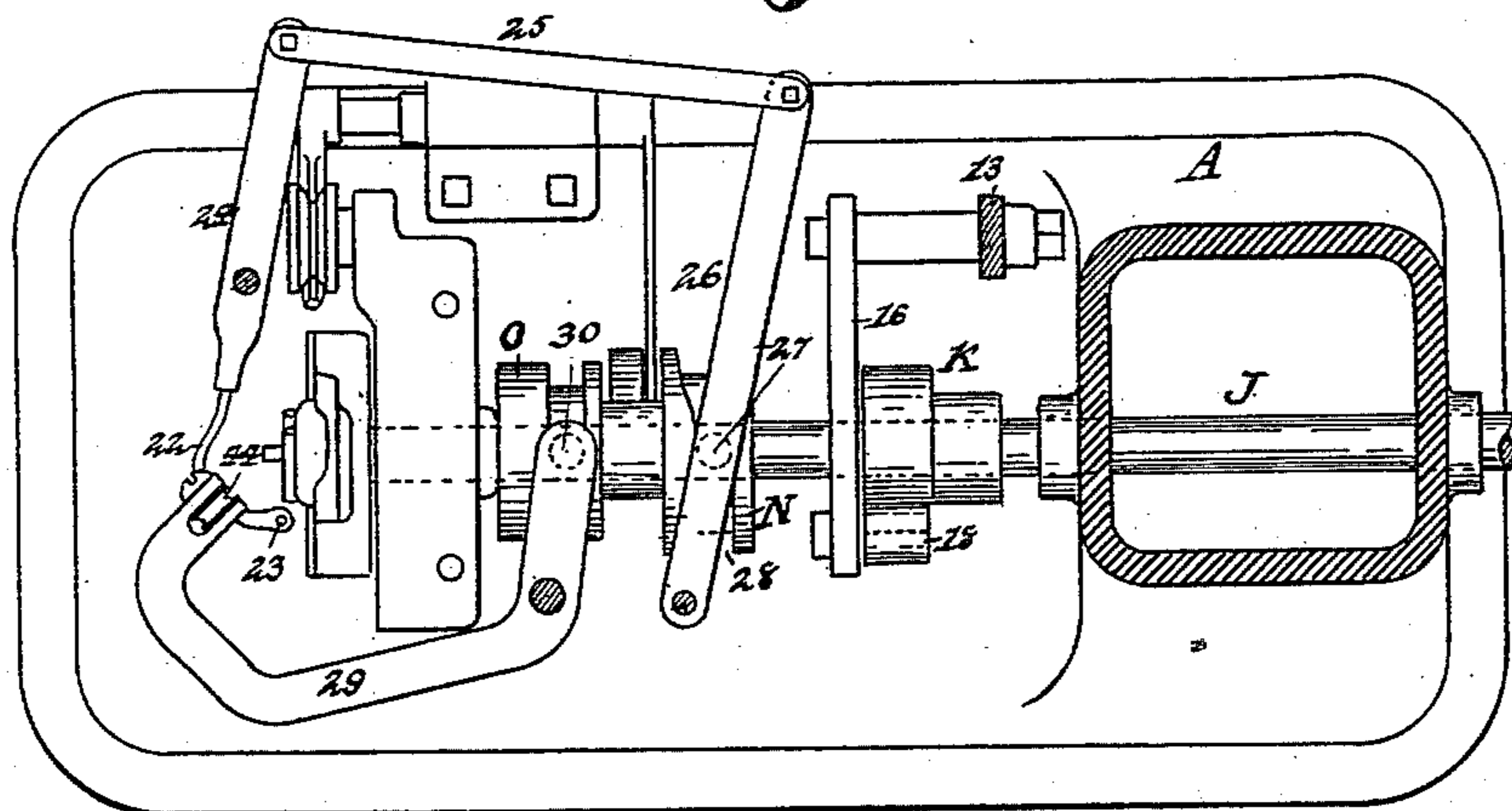


Fig. 5.

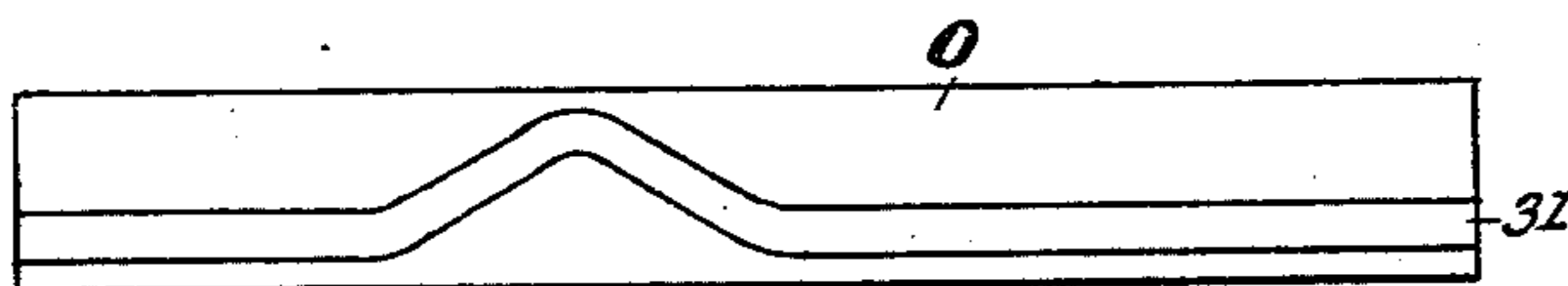


Fig. 6.

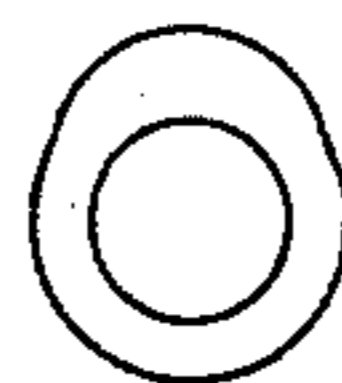


Fig. 7.

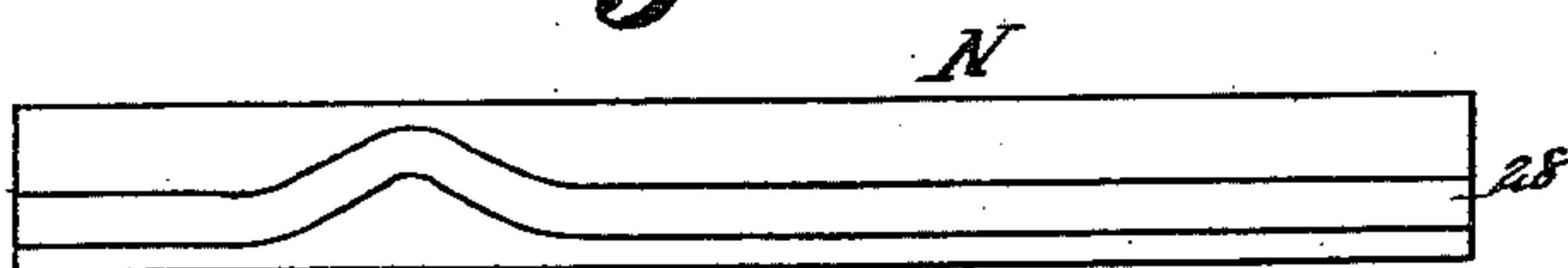


Fig. 8.

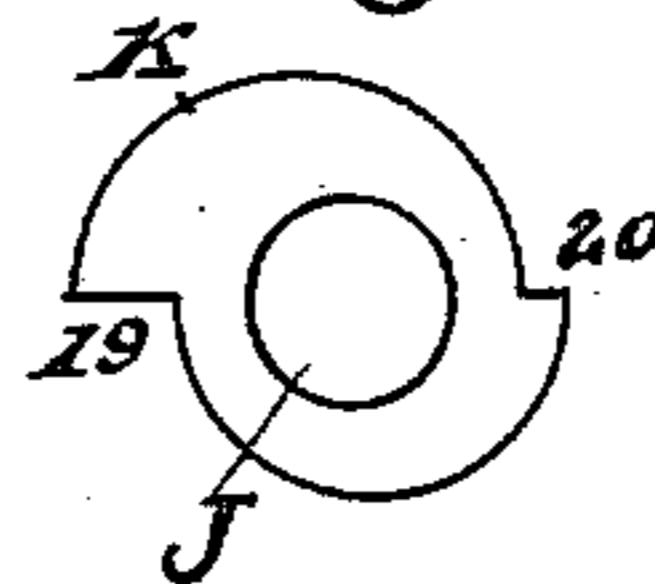
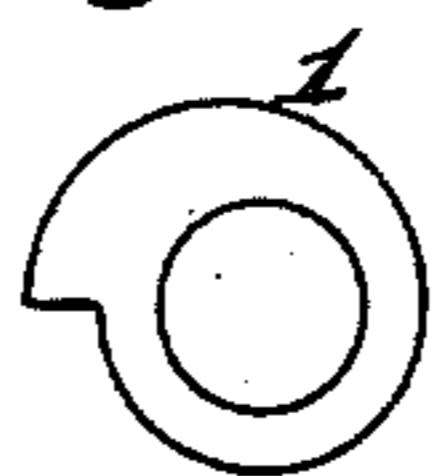


Fig. 9.



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Fig. 10.

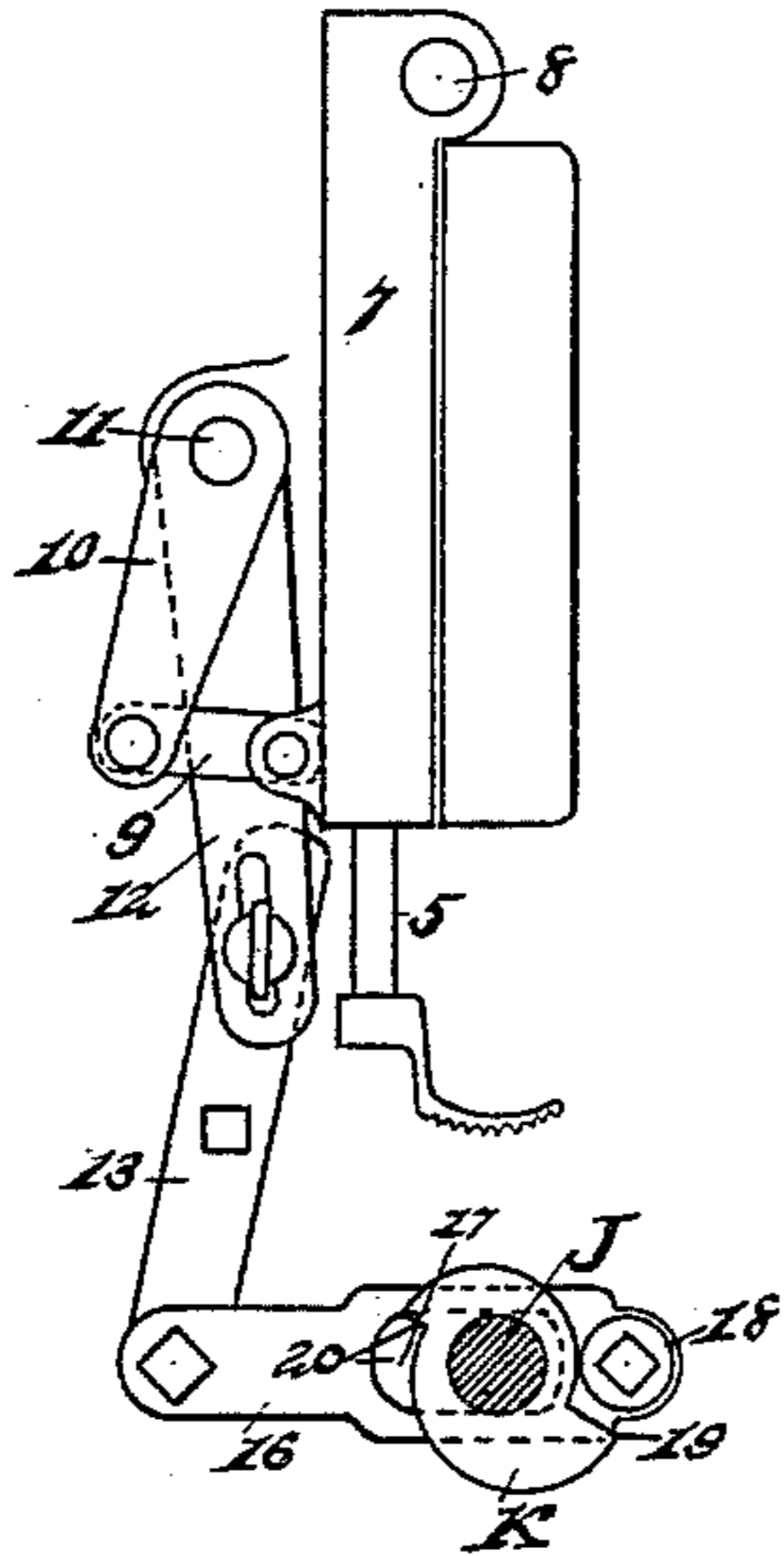


Fig. 11.

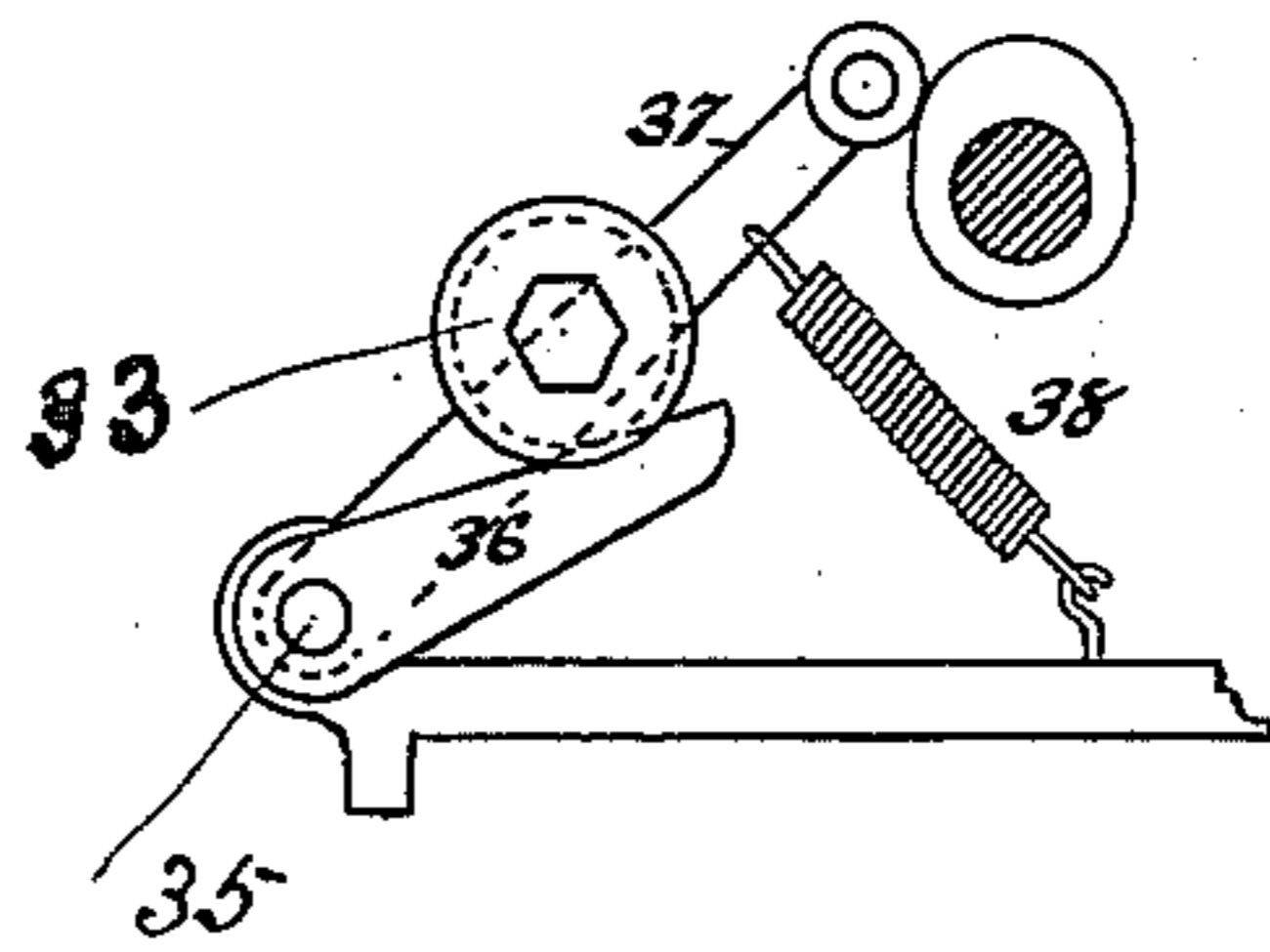


Fig. 12.

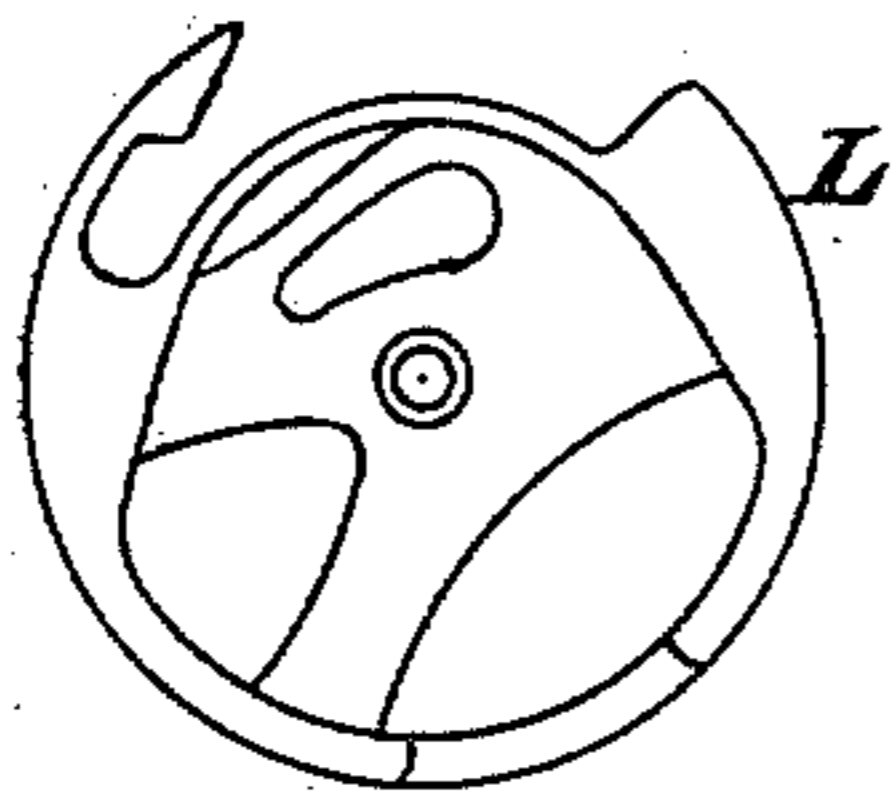


Fig. 14.

Fig. 15.

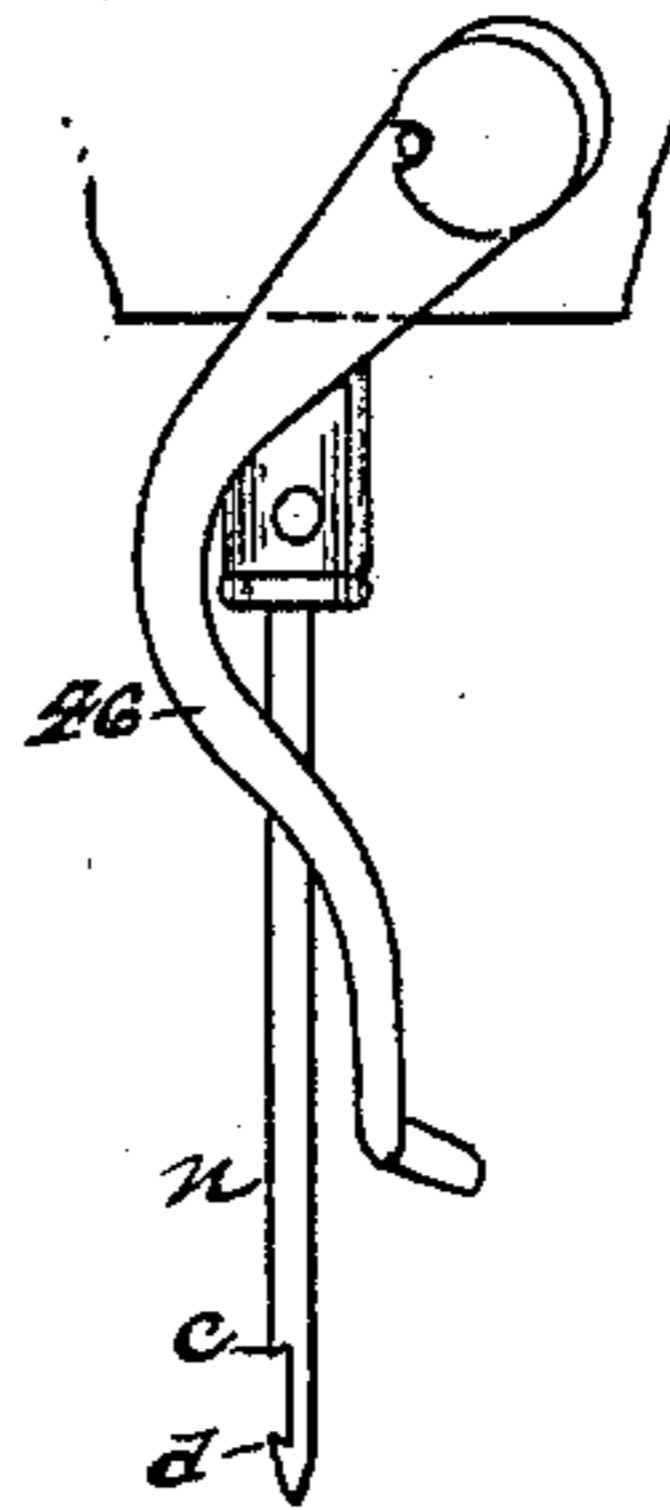
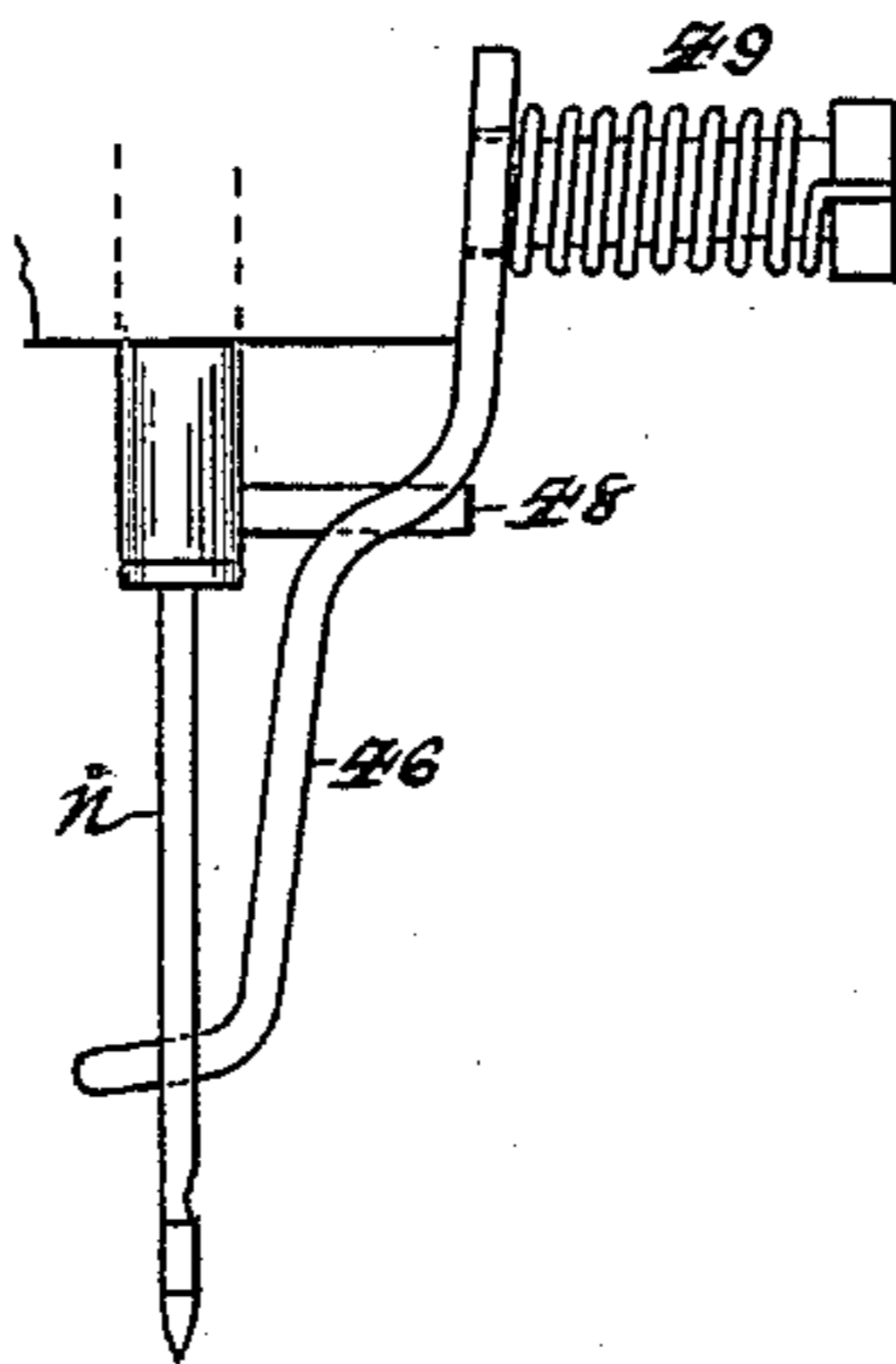
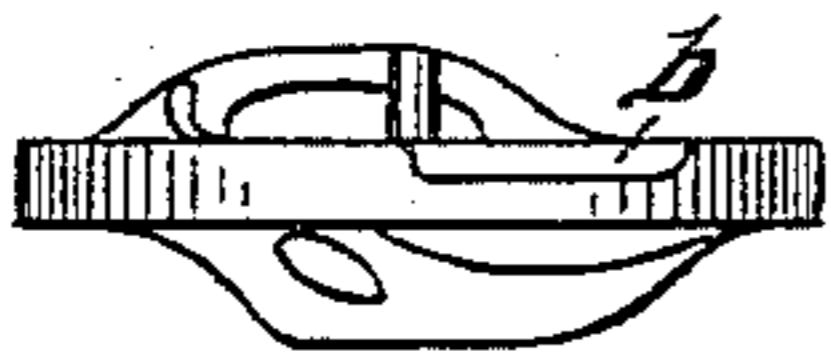


Fig. 13.



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Fig. 16.

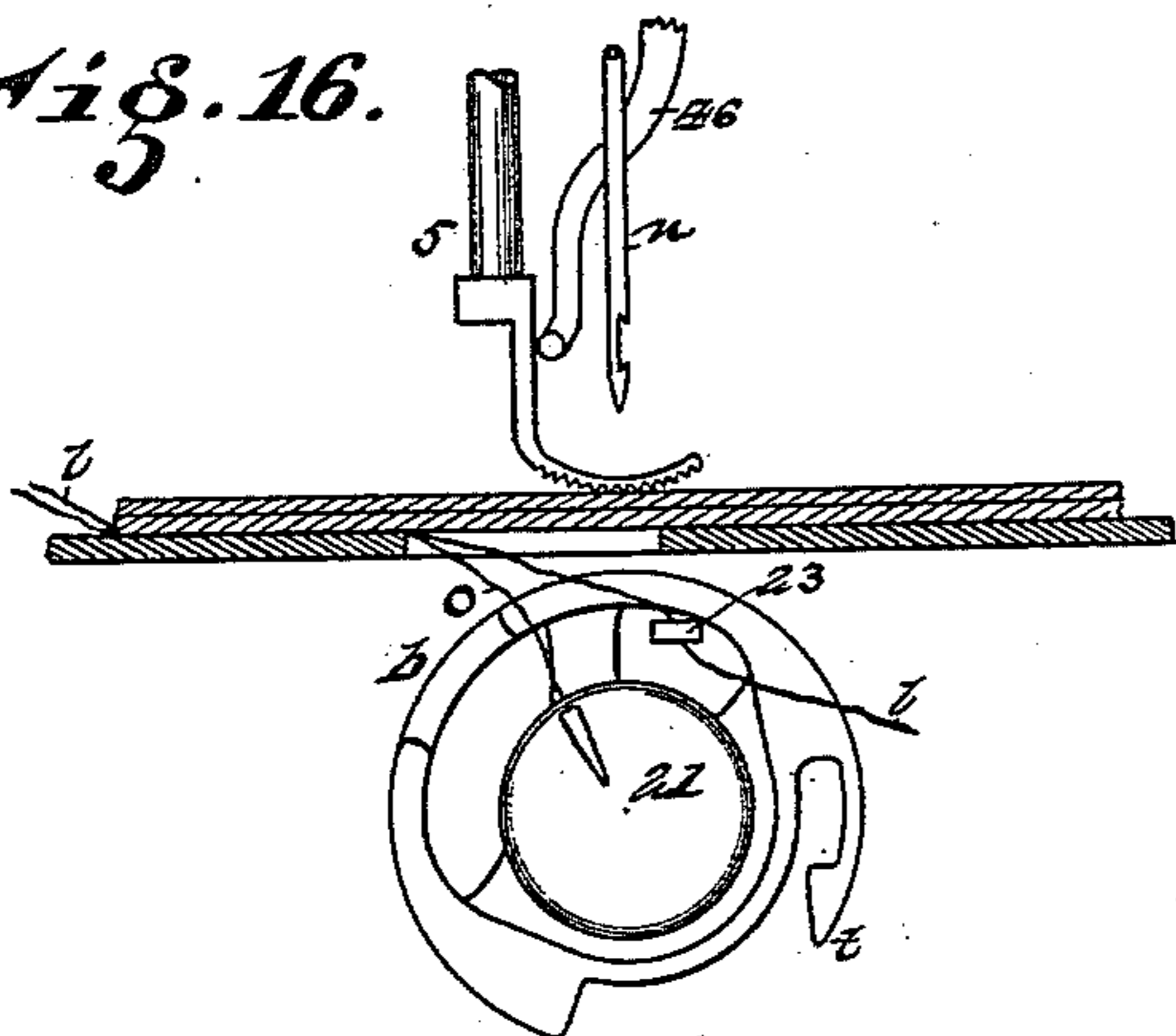


Fig. 17.

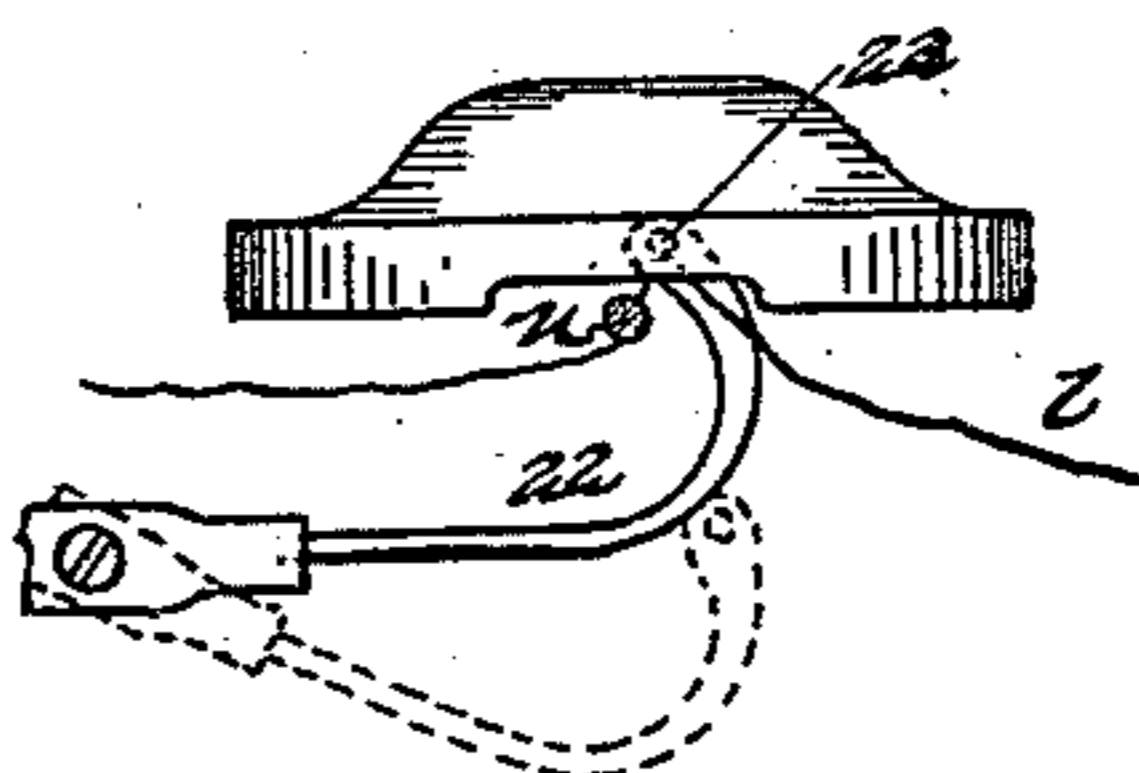


Fig. 18.

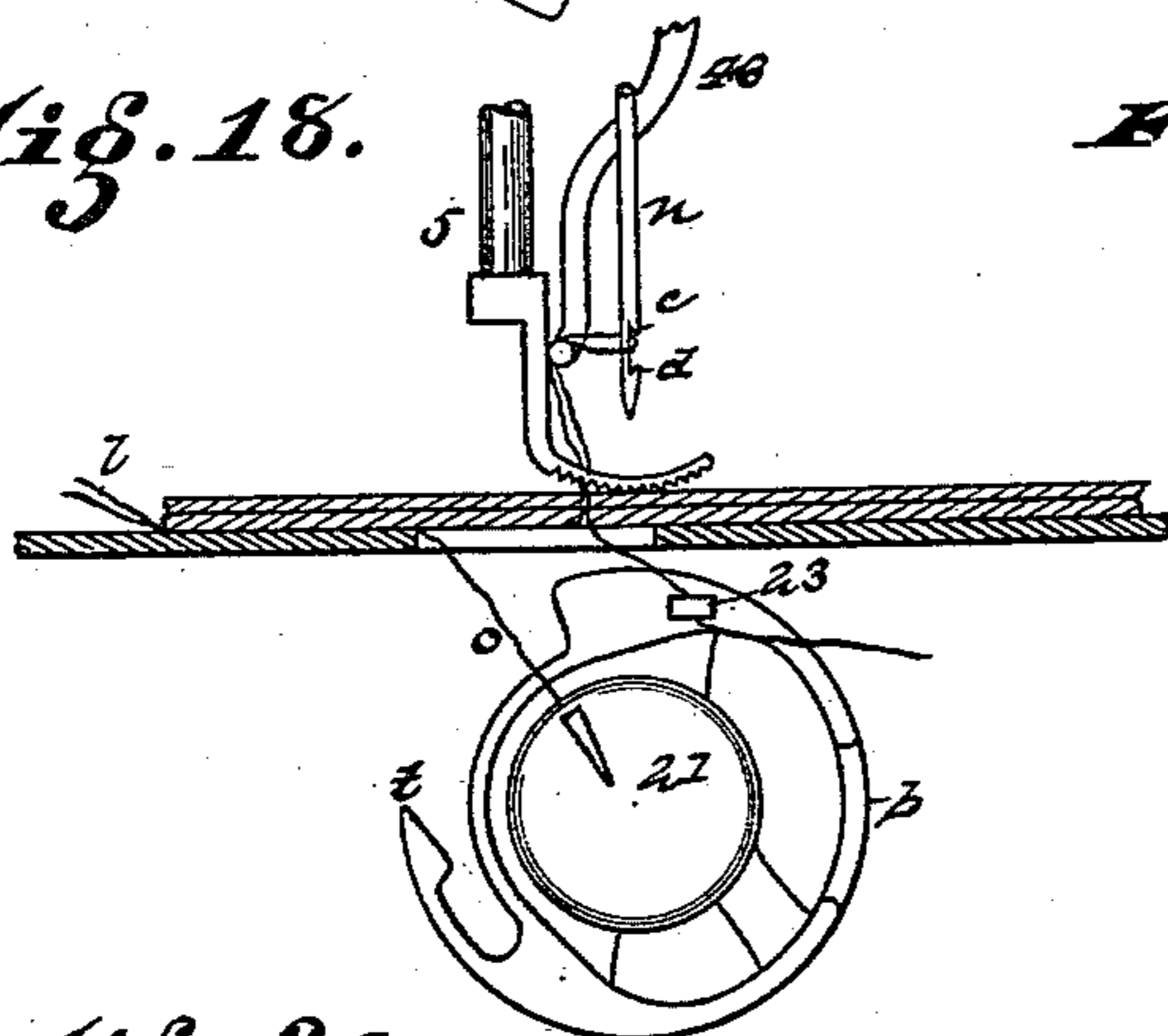


Fig. 19.

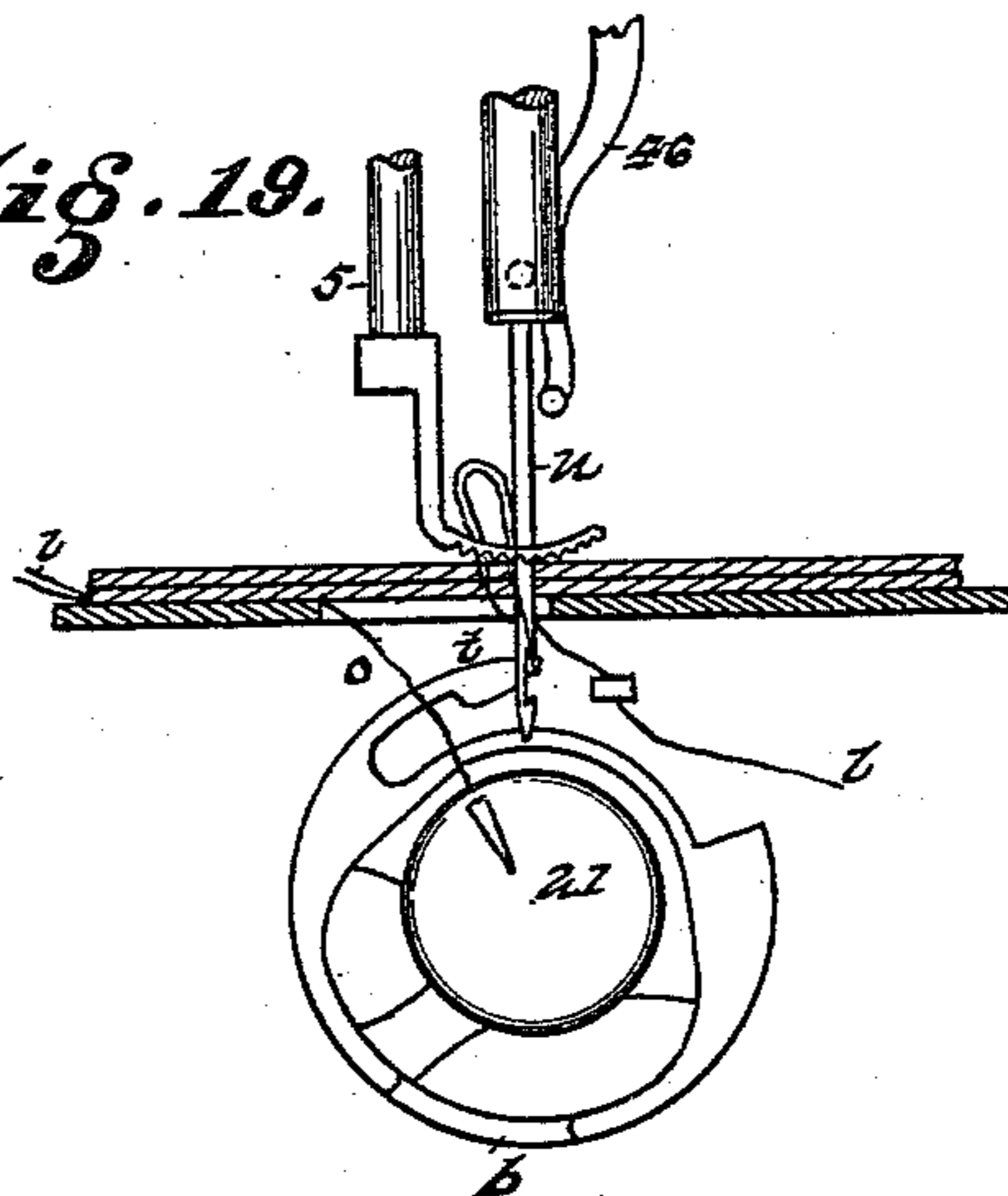


Fig. 20.

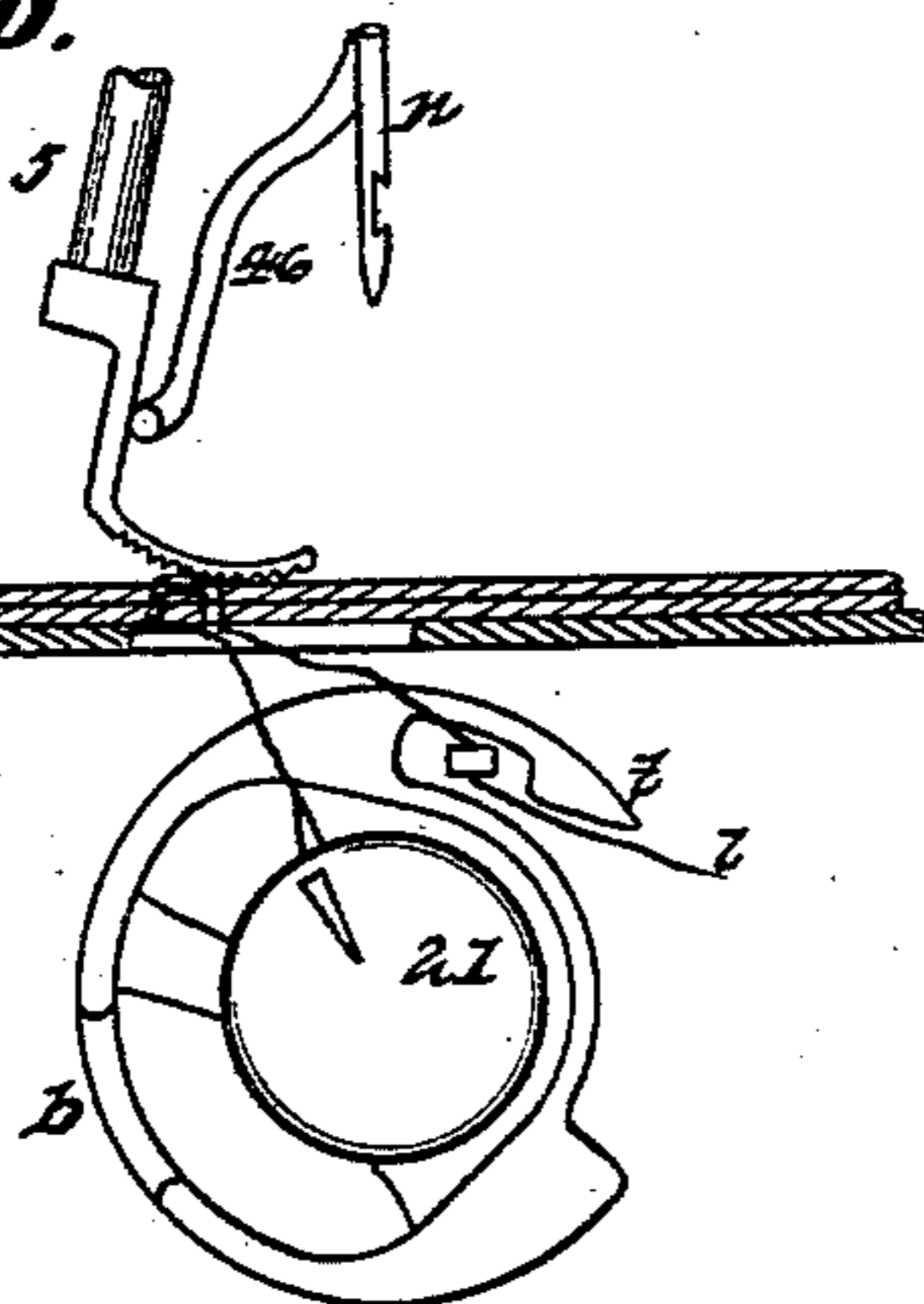
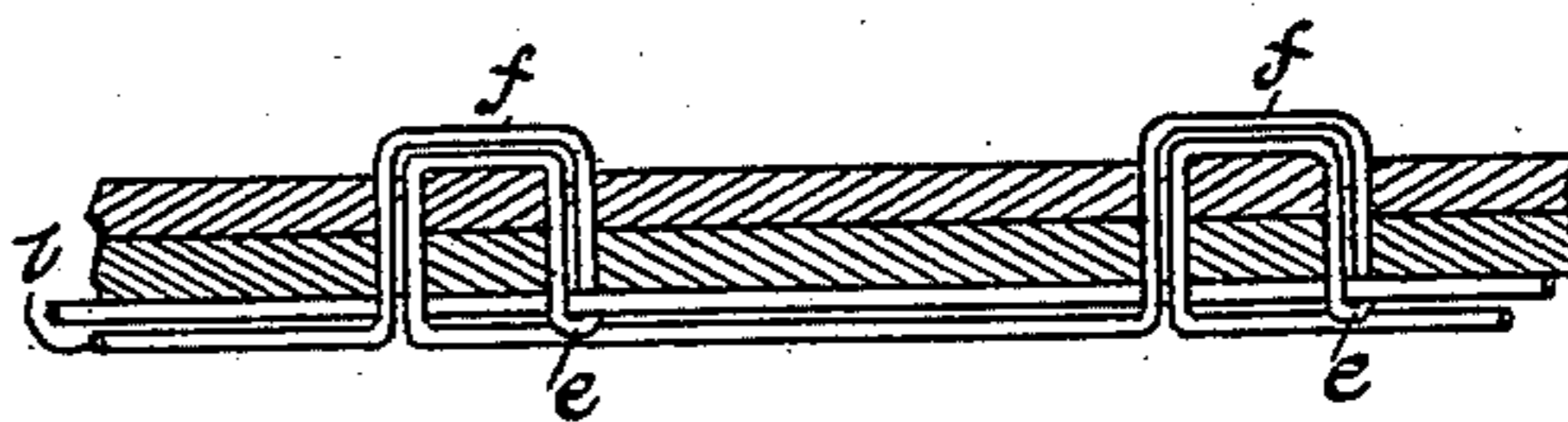


Fig. 21.



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UNITED STATES PATENT OFFICE.

LOUIS L. MILLER, OF NEWPORT, ASSIGNOR OF ONE-HALF TO FRANK H. PERKINS, OF COVINGTON, KENTUCKY.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 424,490, dated April 1, 1890.

Application filed May 29, 1888. Serial No. 275,452. (No model.)

To all whom it may concern:

Be it known that I, LOUIS L. MILLER, of Newport, in the county of Campbell and State of Kentucky, have invented certain new and
5 useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to a new machine adapted to make a skip-and-lock stitch of the character described in an application,
10 Serial No. 307,676, filed by me April 19, 1889. In quilting or sewing various kinds of materials it is desired to have the thread principally upon one side of the goods and still have the material suitably tied or fastened
15 together. This is especially the case with sweat-collars for harness, gig, saddle-pads, and other parts where the presence of the thread would rub the horse. By sewing these parts with my improved stitch the thread is
20 principally on one side and the pad is securely tied or quilted together.

The various features of my invention will be fully set forth in the description of the accompanying drawings, making a part of this
25 specification, in which—

Figure 1 is a front elevation of my improvement attached to a sewing-machine frame. Fig. 2 is a side elevation of the reverse or back side of the machine. Fig. 3 is an end
30 elevation of the same. Fig. 4 is a top plan view with the plate and top part and needle-arm removed. Fig. 5 is a plan view of one of the cams. Fig. 6 is an elevation of another cam. Fig. 7 is a plan view of the third cam.
35 Fig. 8 is an elevation of the fourth cam. Fig. 9 is an elevation of another cam. Figs. 10, 11, 12, 13, 14, and 15 are detail views of parts of the machine. Figs. 16, 17, 18, 19, 20
40 are diagrams illustrating different steps in the operation of making the skip-and-lock stitch. Fig. 21 is a plan view of the stitch.

A represents the body of the machine.

B represents the base on which the overhanging arm or head of the machine C rests.

45 In the operation of my machine I have designed it to have one skip between every lock of the stitch. For this purpose the needle makes two reciprocations to one revolution of the shuttle, and these several operating parts
50 which are mounted on the lower shaft make one revolution to two of the needle-shaft

when the stitch is to be made of the form shown in Fig. 21.

D represents the driving or band wheel mounted on the needle-shaft E. Said shaft
55 projects through the overhanging arm C, and is provided at its forward end with the crank F for driving the needle-rod.

G represents a spur-wheel keyed upon shaft E.
60

H represents a transmitter communicating motion to the spur-wheel I, which is mounted upon the shaft J. Shaft J is firmly journaled in the frame of the machine and projects forward under the table, as shown in Figs. 1, 2,
65 and 4. Upon this shaft J is mounted to operate these several stitch devices, excepting the needle, which is driven by the crank F.

I have provided means to operate the foot to feed the goods. It is provided with two
70 motions—one to lift and the other to give it the swinging or step motion, and this is accomplished as follows: 1 represents a cam on shaft E, grooved to receive the rear end of the lifting-arm 2, which is pivoted at 3 to the
75 arm C. The forward end of arm 2 engages under the pin 4, which projects out through the slot of the machine from the foot-bar 5.

a is a lever for lifting the foot-bar.

In Fig. 3, 6 represents a spring for holding
80 the foot-bar normally down. In order to give said foot-bar a backward and forward step motion, I provide the following instrumentalities: The foot-bar is supported in the swinging frame 7, which is pivoted to the
85 frame at 8.

9 represents a link hinged to the bottom of frame 7.

10 represents a crank pivoted to link 9 and attached to the rock-shaft 11, that journals on
90 the side of the frame, as shown in Fig. 2. 12 represents a depending arm rigidly attached to said shaft and loosely joined to arm 13, attached to the rock-shaft 14, which journals upon the stud 15. The lower end of the arm
95 13 carries a crank 16, which is provided with slot 17, (see Fig. 10,) so as to move laterally over the shaft J. 18 represents a friction-roller at the rear end of said crank 16.

K represents a cam mounted on the shaft
100 J and provided with two offsets 19 and 20. The short offset 20 moves the foot a distance

sufficient for the lock-stitch, and the longer offset 19 moves the foot a sufficient distance for the skip-stitch and to feed the goods, thus making a short feed and a long feed alternately. While the cam K has made one revolution and moved the foot-bar 5, the shaft E and cam 1 have revolved twice and lifted the foot-bar each time in unison with the backward swinging movement of the foot first explained.

39 represents a spring for drawing on the swing-arms 12 and 13 to bring the foot back into position. The position of the foot in its backward movement is shown in Fig. 20 after it has made the feed movement and is ready to be raised up, as shown in Fig. 10.

The stitch mechanism is constructed as follows: L represents a revolving shuttle which carries a bobbin inclosed in a drum at 21 in the usual manner. In order to pick up the thread, the needle must pass down while the shuttle is in the act of revolving. I have slotted off the shuttle at *b*, Fig. 13, so as to allow the needle to pass down beside the arm of the shuttle when it is performing that part of its revolution. The shuttle is otherwise of the usual construction, and driven by any appropriate means engaging the central portion.

n represents the needle, which is provided with two barbs *c* *d*, and cut away to form an elongated slot, so as to allow of the thread being taken out and put into the needle-eye, as will be hereinafter explained. To accomplish this I have provided a threader 22, which is preferably hook-shaped and provided with the eye 23. Said threader is connected to the vibratory arm 24, pivoted to the frame of the machine and connected by the link 25 to the vibratory lever 26, which is provided with stud-and-friction roller 27, engaging in the groove 28 of the cam N. One revolution of the shaft J vibrates the arm 26 once and carries the eye 23 into the position shown in Fig. 17, placing the thread within the slot of the needle.

In order to take up or pull the thread tight at the end of the stitch, I have provided a take-up arm 29, which is operated by cam O. 30 represents a friction-stud journaling at the heel of said arm and working in the cam-groove 31. In making a skip-stitch a free supply of thread must be provided.

33 represents a tension-wheel, around which the thread passes from the spool 34.

35 represents a rock-shaft, carrying a friction-arm 36, that rests in the groove on the under side of the friction-wheel 33, to hold the thread when the slack is taken up.

37 represents a driving-arm attached to the opposite end of shaft 35.

38 represents a spring for holding the rear end of arm 37 rigidly against the cam. This cam is so adjusted that the arms 37 and 26 are vibrated, so as to relieve the wheel 33 from friction at the moment it is desired the needle to draw the thread through freely.

I have shown the shuttle as operated in the usual manner for revolving shuttles, and it is shown supported in the journal-case 40.

41 represents a latch-arm for holding the bobbin-drum in position.

In the operation of my machine the shuttle is employed to make the lock-stitch. The lock portion of the stitch is shown at *e*, Fig. 21, and the skip is shown on the upper side of the cloth, between the double threads *f* *f*. This stitch is made from two threads and by the following operation of the machine: The parts are brought into the position shown in Fig. 16, representing the thread passing from spool 34 over the friction-wheel 33, thence through the eye of the flexible spring-arm 43, thence over the roller 44, on the end of the arm 29, thence through the eye 23 of arm 22, and thence up through the slot 45 of the throat-plate. The bobbin-thread *o* is likewise passed directly up through the slot 45 of the throat-plate, in which position, as shown in Fig. 16, they are ready to commence the making of the stitch. The first movement starts the needle *n* down through the goods and through the slot 45 of the throat-plate, during which movement the shuttle has advanced until the slot *b* of the shuttle is brought under the line of the needle. The arm 22 is then moved round, carrying the thread *l* past the needle *n* and laying the thread in the slot of the hook between the barbs, as shown in Fig. 17. The lower barb *b*, pulling the thread up through and forming the loop, as the needle is retracted upward the guide-arm 46 is moved backward by spring 49 and pulls the loop back against the foot-bar, as shown in Fig. 18. This causes the loop to be drawn so that it will not slip out of the open slot of the needle-eye, but will be caught by the upper barb *c* as the needle descends. During this time the foot has made its shortest feed motion and brought the goods in the position shown in Figs. 18 and 19, the shuttle having revolved around so as to bring its point *t* up beside the needle when it engages with the loop. To facilitate this I have flattened off or slightly grooved the needle on the inside, so as to allow the hook *t* of the shuttle to pass between the thread and the needle. The shuttle moves forward and strips the thread out of the eye, and it loops it around the shuttle-thread *o* to form a lock-stitch in the ordinary manner of revolving shuttles.

I have shown the stitch in Fig. 21 as being loose and not drawn tight, so as to illustrate the manner of stitch. It will be seen that the needle in this operation is threaded and unthreaded with every complete skip-and-lock stitch made, and that the upper barb *c* serves to carry the thread down through the goods. In consequence of this there is considerable slack thread. To draw this tight I provide the take-up arm 29, which is moved by the cam O to pull the thread back and take up the loop. As soon as the take-up

arm has pulled the loop of the thread taut, the foot moves backward, carrying the goods with it into the position shown in Fig. 20. When the foot is raised a second time by the lever 2, the spring 38 brings it into the normal position and it immediately drops down into the position shown in Fig. 16 ready for another stitch. The guide-arm 46 is normally held in position against the needle by the spring 49. The tension of this spring is sufficient as soon as the needle is raised up to carry the guide-arm backward against the foot-shank, as shown in Fig. 18. In order to bring this forward into position again, I have provided a pin 48, attached to the needle-bar, which, as the needle-bar descends, strikes against the shank of the guide, as shown in Fig. 19, brings it forward, and it being loosely hinged upon its pivot it passes round to the front side of the needle-bar by the lever moving on its pivot.

Having described my invention, what I claim is—

1. The combination, with an open-eyed needle and the needle-bar having a horizontally-projecting pin 48, of the guide-arm 46, loosely pivoted to the head of the machine, and the

spring 49, located on the guide-arm pivot and adapted to normally hold said guide-arm in position against the needle, substantially as described.

2. The combination of a shuttle having recesses on one side of its rim, the needle *n*, a threading and take-up mechanism, the tension-wheel 33, around which the thread passes from a spool, the rock-shaft 35, having a friction-arm 36, that rests in a groove in the under side of the wheel 33 to hold the thread when the slack is taken up, and the driving-arm 37, attached to the opposite end of said shaft, substantially as described.

3. The combination of an open-eyed needle, the needle-bar having pin 48, the guide-arm 46, the spring 49, the shuttle *L*, the threader 22, the take-up arm 29, the shaft *J*, carrying devices for operating the stitch mechanism, and the shaft *E*, operating the needle-bar, substantially as described.

In testimony whereof I have hereunto set my hand.

LOUIS L. MILLER.

Witnesses:

J. WATSON SIMS,
G. C. HOLLOWAY.