

No. 701,871.

Patented June 10, 1902.

A. GIACOMINI.  
BUTTON SEWING MACHINE.

(Application filed July 5, 1901.)

(No Model.)

4 Sheets—Sheet 1.

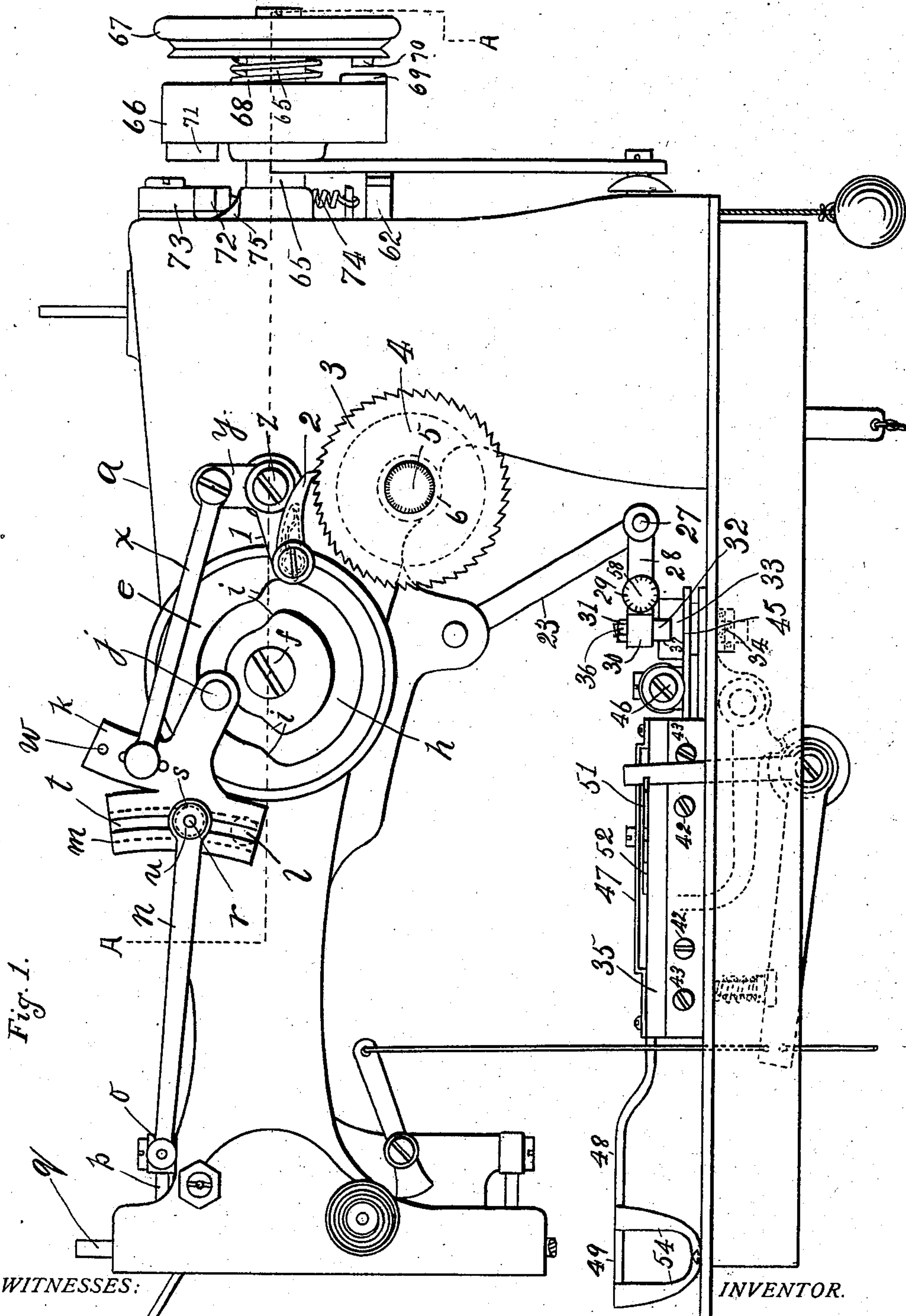


Fig. 1.

WITNESSES:

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*M. J. Begley.*

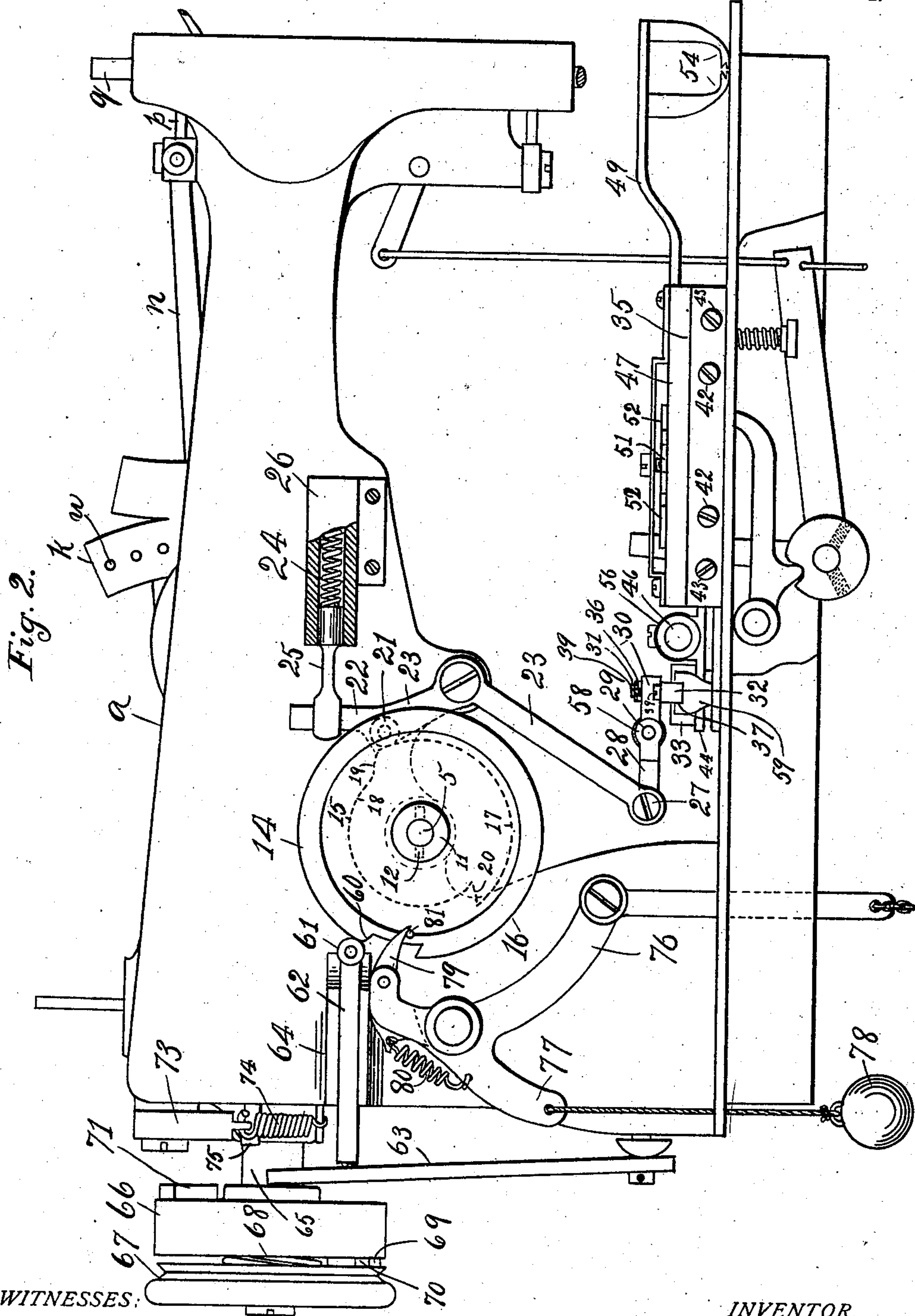
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 BUTTON SEWING MACHINE.  
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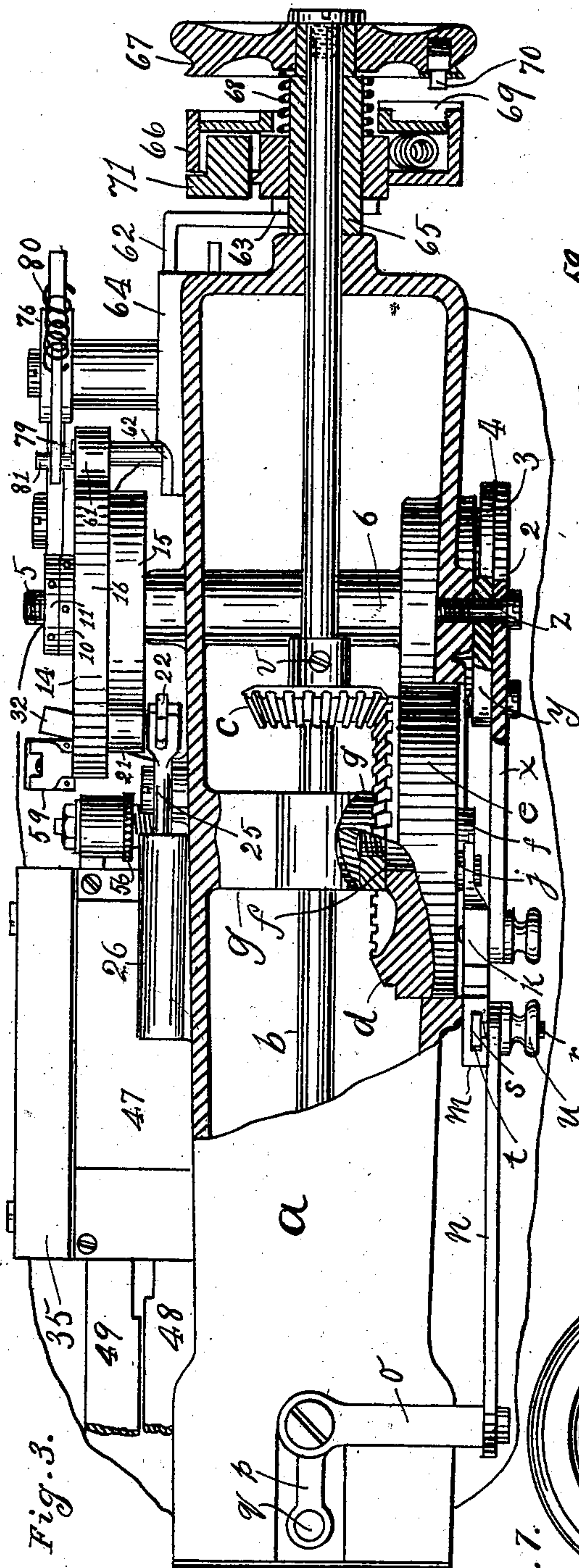
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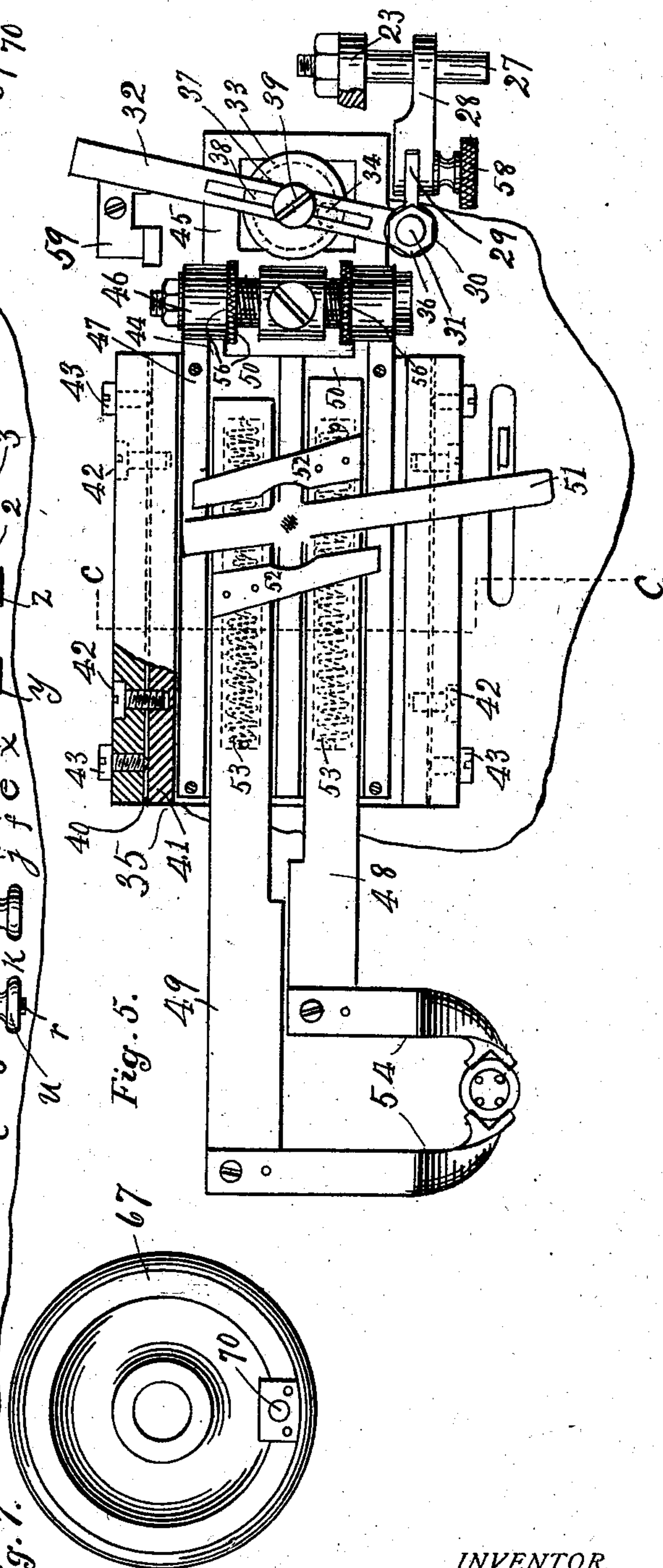
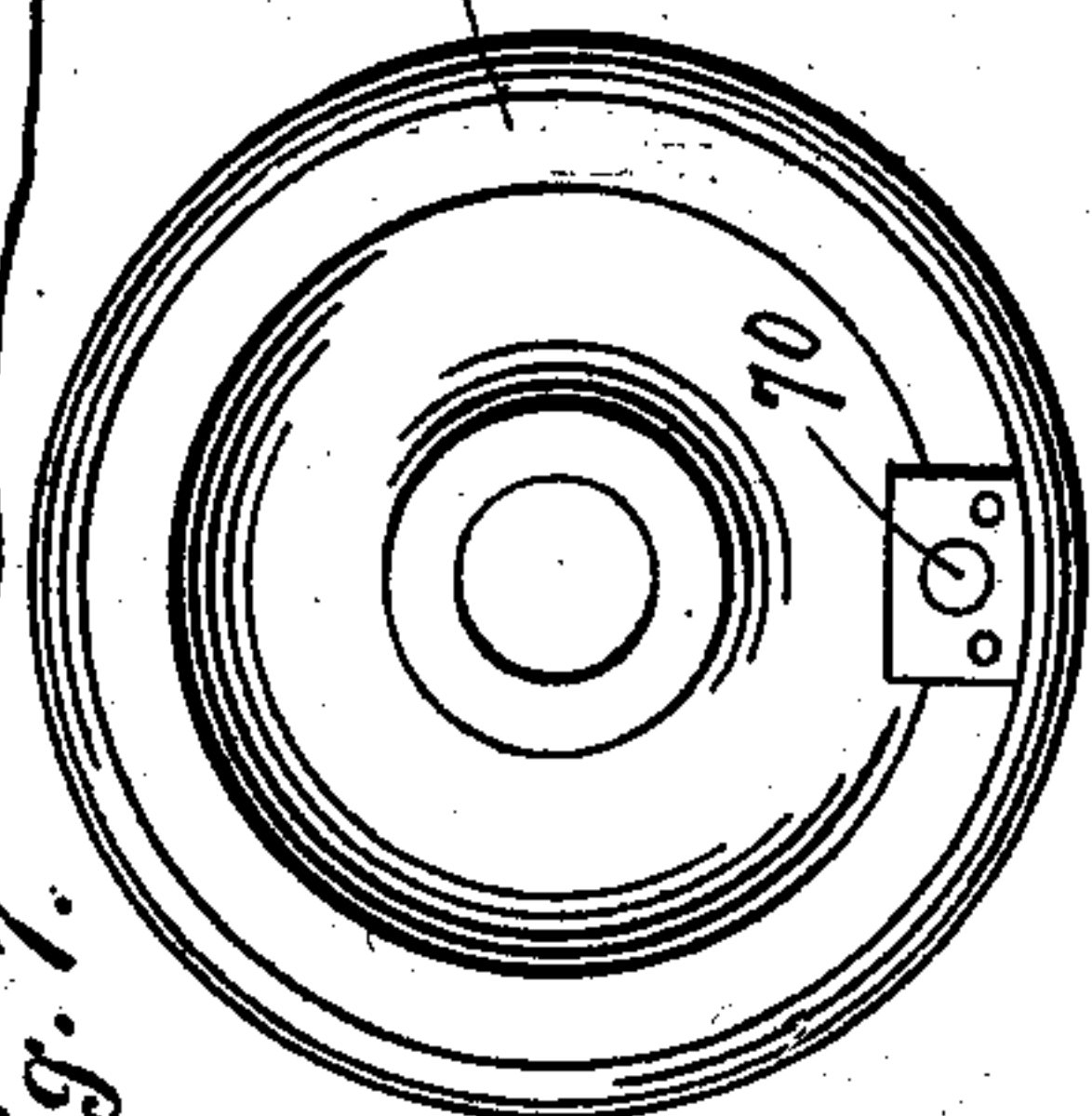


Fig. 7.



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Fig. 8.

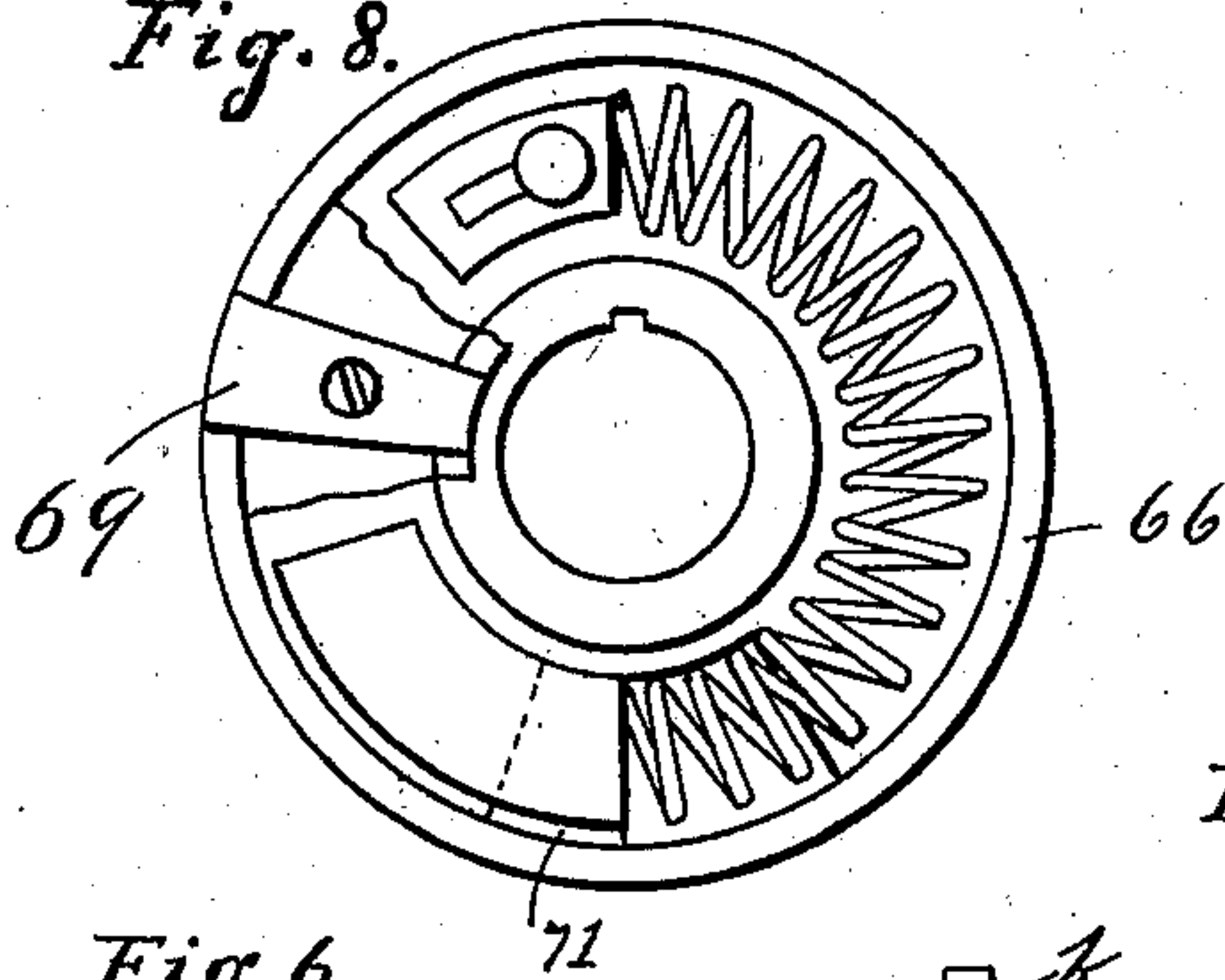


Fig. 9.

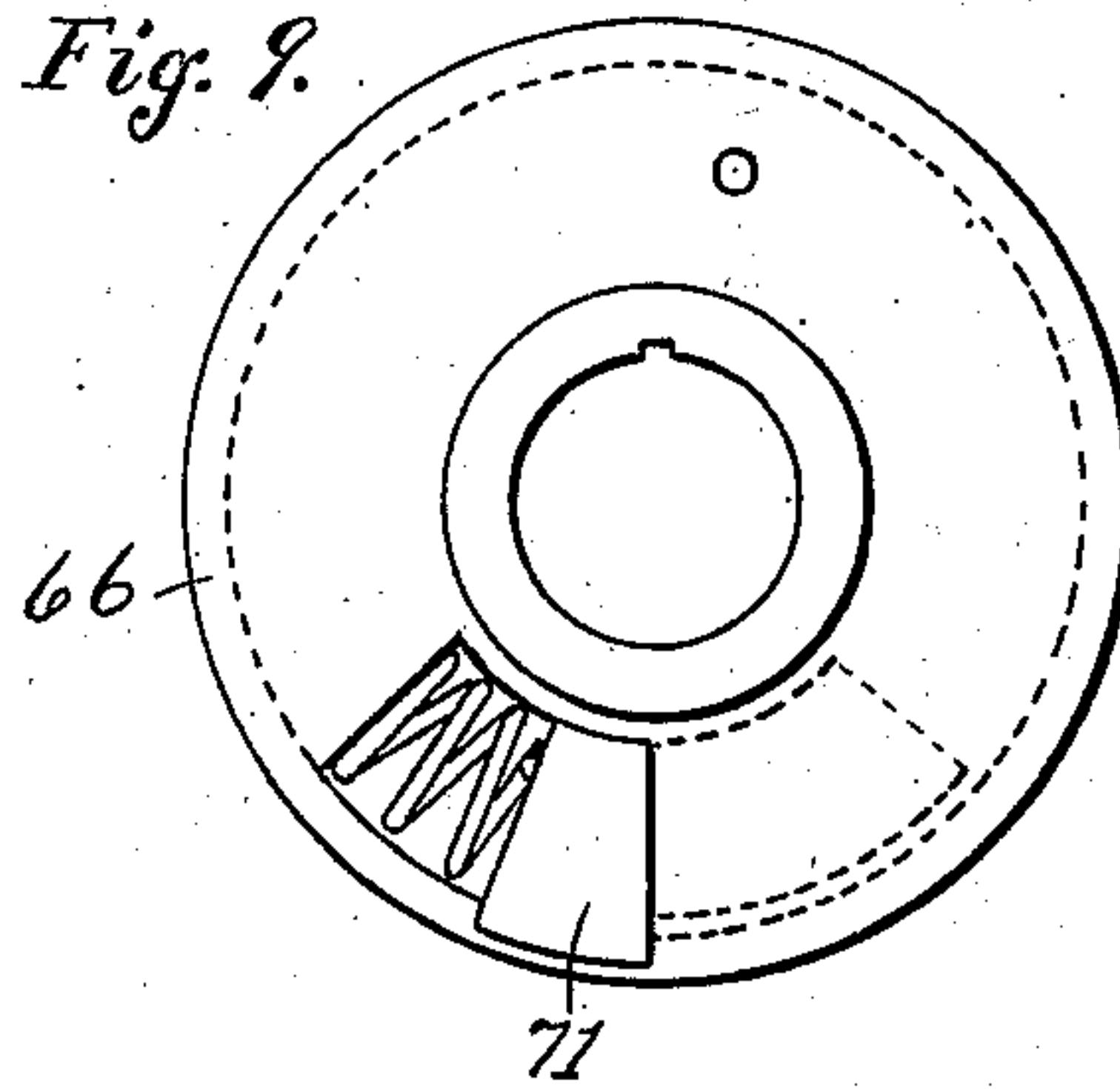


Fig. 4.

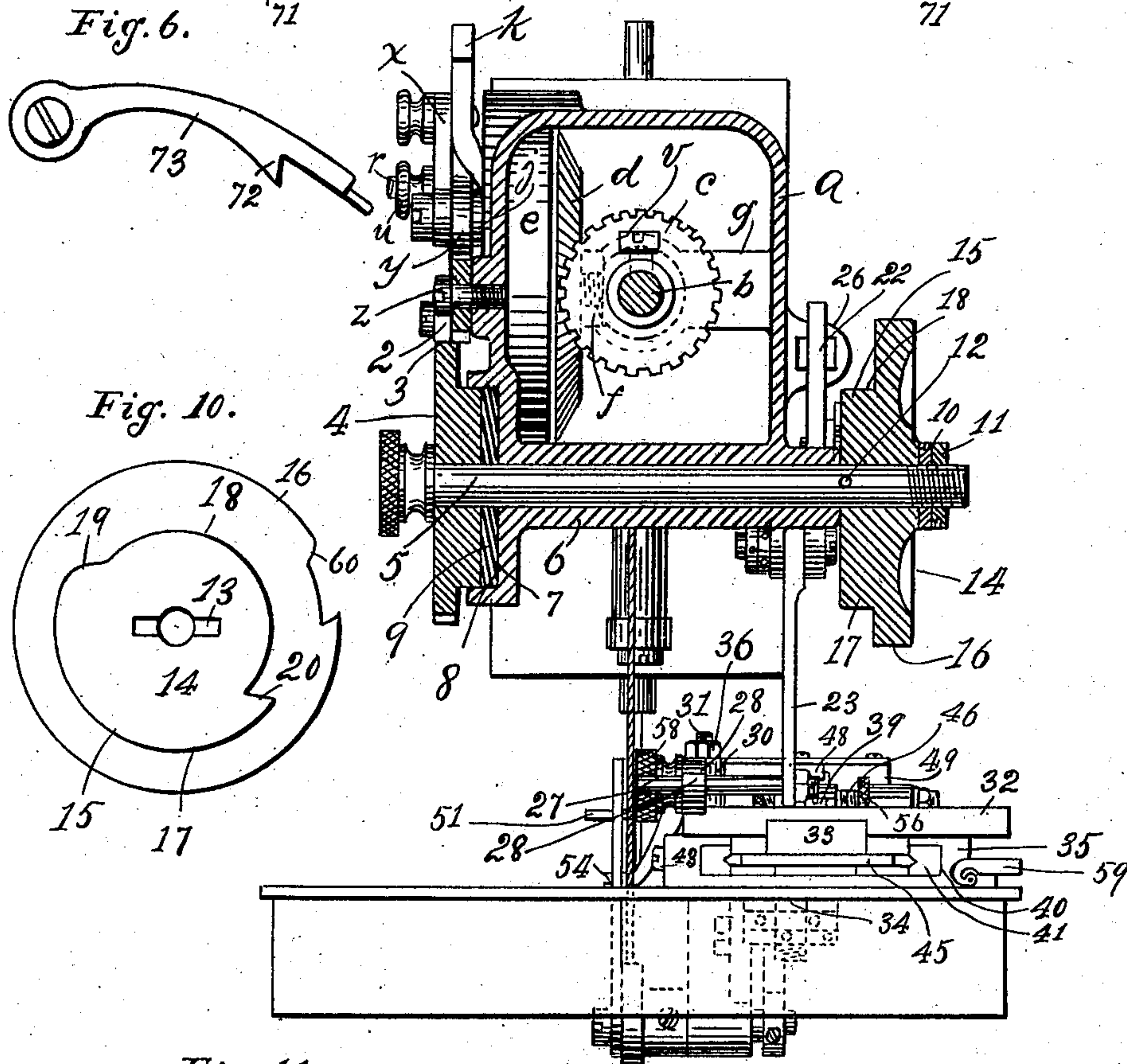


Fig. 10.

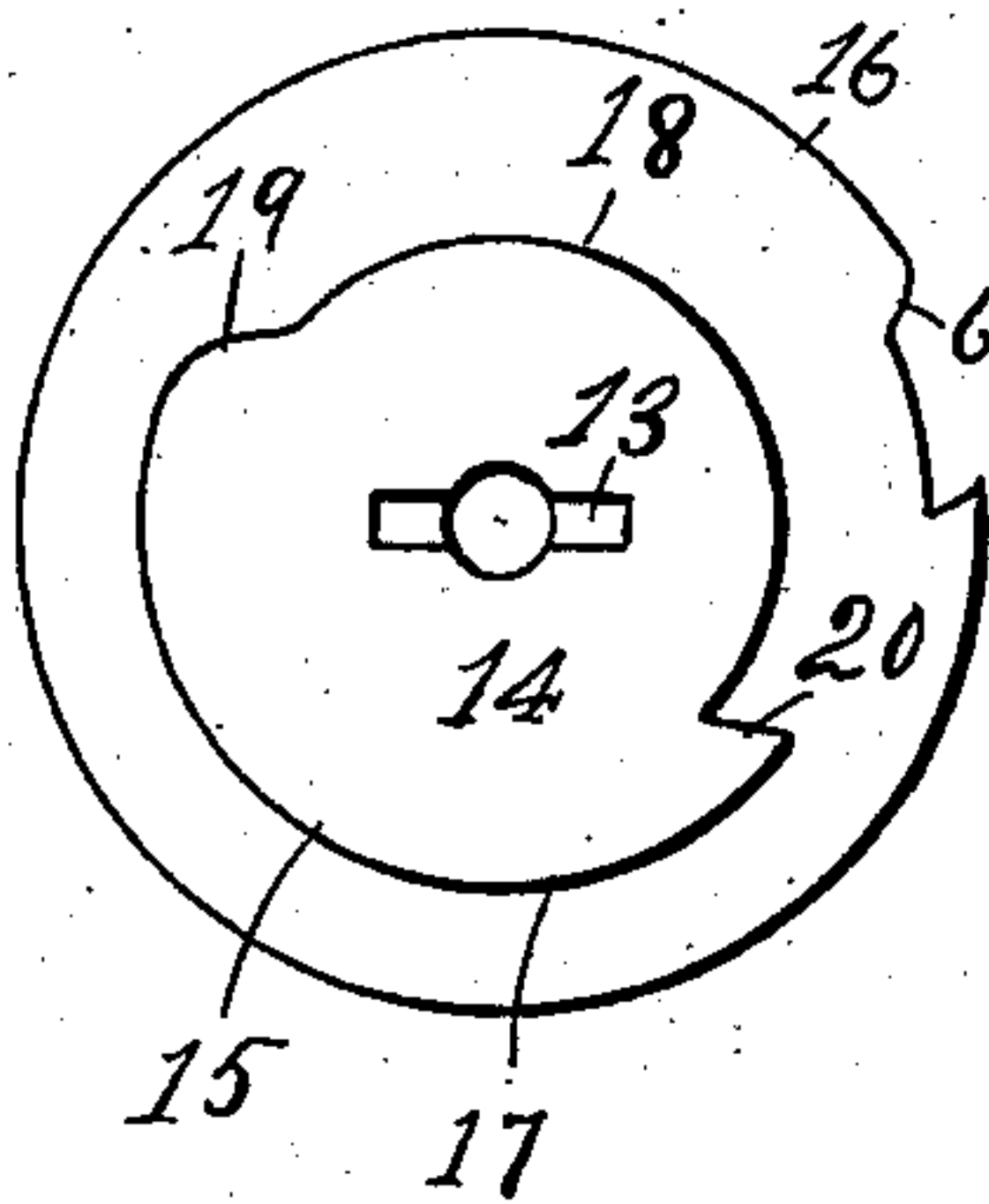
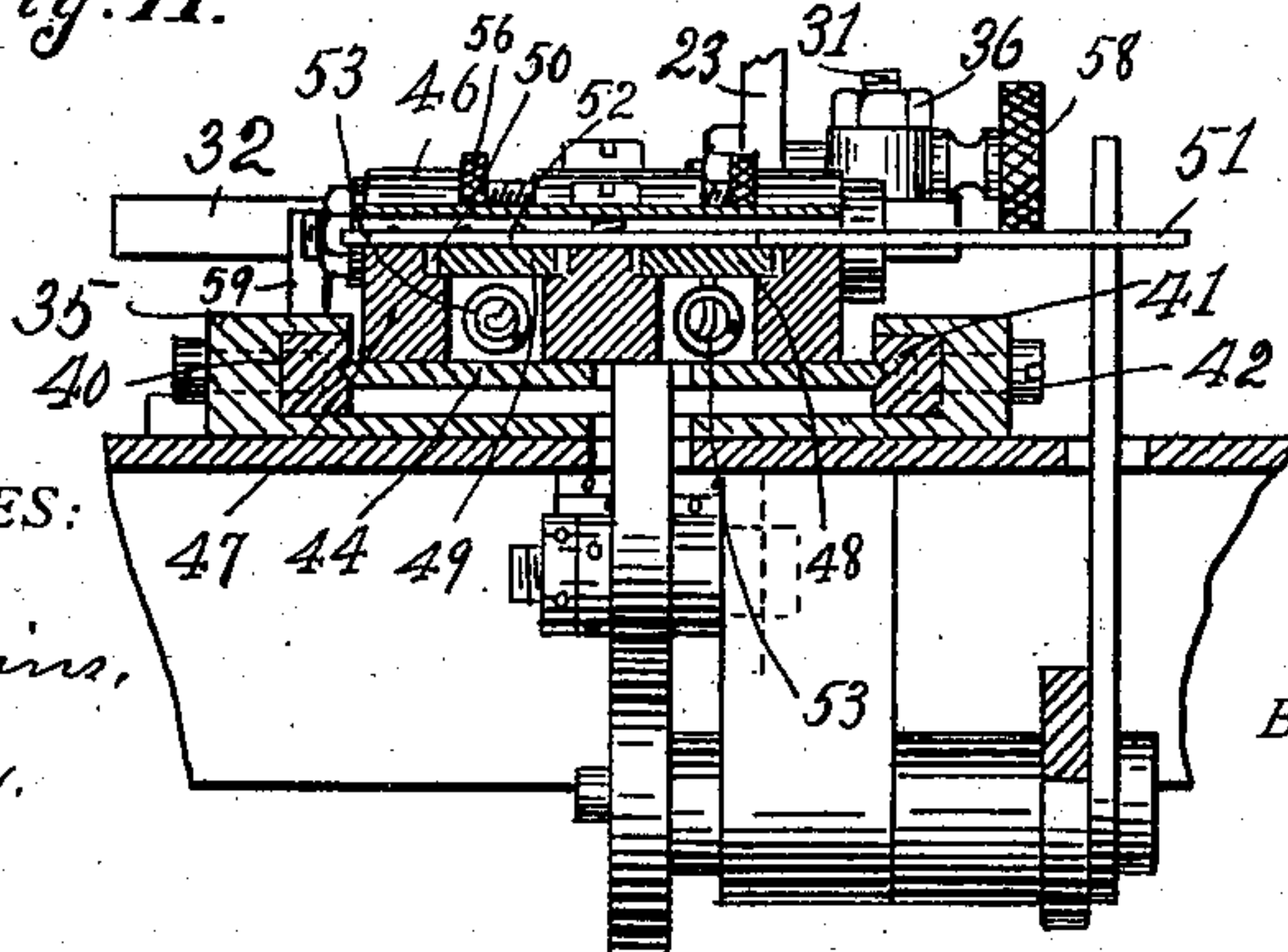


Fig. 11.



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# UNITED STATES PATENT OFFICE.

ACHILLES GIACOMINI, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO  
ANDREW WHITE, OF VALLEJO, CALIFORNIA.

## BUTTON-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 701,871, dated June 10, 1902.

Application filed July 5, 1901. Serial No. 67,237. (No model.)

*To all whom it may concern:*

Be it known that I, ACHILLES GIACOMINI, a citizen of Italy, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Button-Sewing Machines, of which the following is a specification.

My invention relates to improvements in button-sewing machines, the same being improvements on the button-sewing machine invented by F. T. Leilich and patented October 9, 1900, No. 659,537, the object of my invention being to simplify the construction of the machine and to render it easier to operate, adjust, and keep in repair.

My invention therefore resides in the novel construction, combination, and arrangement of parts hereinafter fully specified, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of my improved machine. Fig. 2 is a rear elevation of the same. Fig. 3 is a horizontal section on the line A A of Fig. 1. Fig. 4 is a vertical section through the shaft carrying the ratchet-wheel. Fig. 5 is a plan view of the clamp, the cover being removed. Fig. 6 is a side view of the spring-actuated lever for retarding the motion of the machine before arresting the same. Fig. 7 is a side view of the driving-pulley. Figs. 8 and 9 are side views of the clutch. Fig. 10 is a side view of the cam-wheel. Fig. 11 is a cross-section of the clamp-carrier on the line C C of Fig. 5.

The hollow arm *a* of the machine is in general of the usual construction and carries within itself the main driving-shaft *b*, which by mechanism common to this class of machines reciprocates the needle to make the stitches. From said driving-shaft there is actuated mechanism for shifting the needle from one eye of a button to another to sew the button onto the cloth, and such mechanism is as follows: Said driving-shaft has mounted thereon a bevel-pinion *c*, meshing with a bevel-wheel *d*, formed on the inner surface of a cam-wheel *e*, said wheel *e* being mounted on a stud *f*, screwed into a bridge *g*, formed integral with the hollow arm *a* of the machine. Said cam-wheel has in its front face a cam-groove *h*, having high and low dwells connected by two inclines *i*, and in said groove rides the cam-roller *j*. Said roller

*j* is carried by an arm of a bell-crank lever *k*, pivoted at *l* in the frame of the machine, another arm *m* of said lever being connected by a link *n* with an arm *o* of the horizontal swinging carrier *p* of the needle-bar *q* to vibrate the latter. The connection of the link *n* with the bell-crank lever *k* is made by means of a flat-headed screw *r* passing through the end of said link, the head *s* of which may be moved in a T-slot *t*, formed in said lever *k* in an arc of a circle having the link *n* for radius, and said head may be clamped at any point in said slot by a set-nut *u* on the projecting threaded end of said screw.

As the cam-wheel revolves the needle is shifted from one position, in which it can penetrate one eye of the button, to another position, in which it can penetrate the other eye, the button having been held stationary in the meantime, and by reason of the adjustability of the end of the link *n* over the T-slot *t* a greater or less distance from the pivot *l* the amount of shift may be varied, as desired, to suit different distances between the eyes of the button. The bevel-pinion *c* is adjustably secured as to its rotational position on the driving-shaft *b* by means of the screw *v*. By this means the parts may be so assembled that the lateral shifting of the needle-bar may be timed to take place while the needle is out of the button-eye.

The bevel-wheel *d* is of twice the diameter of the bevel-pinion *c*, making one revolution for every two revolutions of the main driving-shaft—that is, for every two stitches made by the needle—and it follows that the shifting of the needle from one eye of the button to the other takes place after every stitch, and a return is made to the first eye after the next stitch.

The mechanism for shifting the button to present to the needle the remaining two of the four eyes of the button is as follows: In the bell-crank lever *k* are made a series of holes *w*, in any hole of which series there is secured adjustably the end of a link *x*, the outer end of which is pivotally secured to a bell-crank lever *y* on a rock-shaft *z*, journaled in suitable bearings in the arm *a* of the machine. Said bell-crank lever carries on an arm *1* a spring-actuated pawl *2*, the nose of which is by said spring constantly pressed into engagement with ratchet-teeth *3*, formed



on the periphery of a wheel 4. Said wheel is secured upon a shaft 5, which is mounted in a suitable bearing 6, formed in the frame of the machine.

5 The reciprocation of the pawl 2, derived from the rotation of the main driving-shaft *a* through the bell-crank lever *k*, imparts intermittent rotation to the wheel 4.

10 The wheel 4 is prevented from going forward by its own momentum after the pawl has ceased to operate by the following mechanism: In the arm of the machine is cast or otherwise fixedly secured a disk 7, having a friction-surface 8. Between said friction-surface 8 and the rear surface of the wheel 4  
15 is interposed a friction-washer 9, of fiber, leather, or any other suitable material. Upon the rear reduced end of the shaft 5 are secured two nuts 10 11, by means of which the wheel  
20 4 can be drawn up against the friction material 9 with a greater or less degree of tightness, as may be desired, providing more or less friction.

Through the rear end of the shaft 5 on the  
25 rear side of the machine is diametrically passed a pin 12, the ends of said pin projecting on each side of said shaft. Said pin engages the opposite ends of a groove 13, cut in the front face of a cam-wheel 14, loosely  
30 mounted on said shaft 5. This provides a very firm and strong attachment of the cam-wheel to the shaft and avoids lost motion, while it permits of ready removal of the wheel from the shaft when desired.

35 The cam-wheel 14 has two peripheral cam-surfaces formed thereon, the front cam 15 serving to transmit the power to shift the clamp, and the rear cam 16, which is of greater diameter, serving to control the stopping mechanism.  
40

On the front cam 15 are a high dwell 17 and a low dwell 18, connected by ascending and descending inclines 19 and 20, and on said cam rides a roller 21 on an arm 22 of a  
45 lever 23, pivoted on the arm *a* of the machine. Said lever 23 is resiliently resisted by means of a spring 24 actuating a short rod 25, sliding in a guide 26 on the rear of the arm *a* of the machine and connected to the arm 22.

50 The lower end of the lever 23 has secured thereon a pin 27, on which is passed the eye of a link 28, jointed at 29, the other end of said link having an eye 30 pressed over a threaded stud 31 on an arm 32, adjustably  
55 carried by an eccentric 33, pivoted at 34 in the clamp-box holder 35, said eye 30 being secured upon said stud by means of a nut 36. The arm 32 lies in a groove 37, formed in the eccentric 33, and said arm has a slot 38 formed  
60 therein, by means of which said arm can be secured at any desired position in said groove by means of a screw 39, the head of which is screwed down upon said slot.

In the clamp-box holder 35 are adjustably  
65 secured in grooves 40 undercut gibs 41, which form guides for the clamp-box carrier. Said gibs are adjustable in said holder by means

of four screws on each side, of which one pair of screws 42 are screwed into the gibs to draw them outwardly, while the other pair  
70 43 are screwed into the holder and press against the sides of the gibs and move them inwardly. Said gibs are undercut or grooved, and in said grooves slides the carrier 44 for the clamp-box. Said carrier has formed in its  
75 rear end an oblong frame 45, in which the eccentric 33 operates to slide said carrier backward and forward. Upon said carrier is pivotally mounted, as shown at 46, the box 47, carrying the shanks 48 49 of the clamp-jaws. 80  
Said box is formed with two grooves or slides 50, extending side by side parallel with each other, in which said shanks 48 49 slide. In order to operate said shanks, there is provided a lever 51, pivoted on said box between  
85 said grooves. Said lever 51 engages on its opposite sides with arms 52, secured to said shanks. Springs 53 are secured to the shanks at one end and at the other end to the box beneath said shanks. Thus by moving the  
90 lever 51 against the action of said springs the shanks, and therefore also the jaws 54, are reciprocated in opposite directions, and on releasing the lever the springs retract the jaws into their original position and cause  
95 the same to firmly grasp the button.

In order to adjust the position of the clamp for wear of the machine or any other reason or to accommodate imperfectly-made buttons, the position of the box 47 upon the carrier 44  
100 is adjustable by means of set-nuts 56 around the pivot-bolt, having milled heads or other suitable means for turning said nuts.

The construction of the clamp mechanism forms no part of my present invention and is  
105 not herein claimed, being claimed in a separate application filed herewith.

When it is desired to stitch buttons with only two eyes, this is accomplished by disengaging the lower arm of the lever 23 from  
110 the arm 32 in the eccentric, which is done by unfastening the joint 29 of the link 28, said joint being normally connected by means of a screw 58, and after breaking this connection the eccentric is moved into a central position and is held in such position by means  
115 of a locking-fork 59, which passes on each side of the arm 32.

The mechanism for automatically stopping the machine when a predetermined number of  
120 stitches have been made will now be described. The cam 16 has an ascending incline 60, which in the revolution of the cam-wheel 14 engages a roller 61, carried by a slide 62, abutting against the lever 63, pivoted at the lower  
125 end of the arm of the machine, said slide 62 being guided in a suitable slideway 64, cast or otherwise formed upon the arm of the machine. Said slide thus moves said lever rearwardly. The lever has a forked end which  
130 passes around a shell 65, keyed on the end of the main driving-shaft and engages the front face of a clutch 66, said clutch sliding on said shell and keyed thereon and being nor-



mally pressed away from the driving-pulley 67 by means of a coiled spring 68, interposed between the two. When said clutch is moved rearwardly by the movement of the cam-roller 5 up the ascending incline, the clutch is thrown into operative engagement with the pulley by means of a lug 69 on said clutch engaging a lug 70 on the opposing face of the driving-pulley, said driving-pulley being loose on the 10 shaft. After a predetermined number of stitches have been made the roller 61 drops to the low dwell, thereby permitting said clutch to move forward under the action of the spring 68, and a lug 71 on said clutch 15 then engages the under side of an inclined lug 72, formed on the lower face of the lever 73, pivoted on the frame of the machine and swinging outwardly from the main shaft, thereby raising said lever against the action 20 of a spring 74 and applying friction to said clutch to retard the same until said lug 71 has passed the lug 72, when said lever 73 drops under the action of said spring, and at the same time the lug 71 abuts against a fixed 25 stop 75, thereby positively arresting said clutch and the main driving-shaft. The clutch is prevented from rebounding on its stoppage by reason of said lever.

To start the machine, the operator presses 30 any suitable foot-lever, (not shown,) thereby actuating a lever 76, from another arm 77 of which is suspended a weight 78 under the bed of the machine. Said lever 76 carries a pawl 79, pivoted on said lever, the rear end 35 of which pawl 79 is connected by means of a spring 80 to said lever, thereby normally throwing the front end upward. The upward movement of said front end is limited by the abutment of the rear end of the pawl 40 against the boss of the lever 76, by which it is pivoted upon the arm of the machine. Upon pressing the foot-lever the front end of the pawl 79 engages a stud 81, projecting rearwardly from the cam-wheel 14, moving the 45 latter downward, and thereby forcing the roller 61 up the ascending incline 60 from the low dwell to the high dwell of the cam 16 and starting the machine. This starting and stopping mechanism forms no part of my 50 present invention and is not claimed herein, being claimed in a separate application filed herewith.

The cams 15 16 are so arranged relatively to each other that not only will the roller 61 5 be shifted on to the high dwell to bring the driving-pulley 67 into engagement with the clutch 66, but likewise the roller 21 will be moved on to the high dwell 17 of the clamp-shifting cam 16 at the commencement of the 60 operation of stitching the button.

The machine having been started, the needle will make one stitch through one eye of the button and will then, by means of the bevel-pinion *c*, bevel-wheel *d*, cam-wheel *e*, roller *j*, 65 lever *k*, link *n*, and carrier *p*, be shifted transversely of the arm to make one stitch through another eye of the button. This movement

will be repeated until a predetermined number of stitches have been made, when the cam 15 will have rotated through such an arc 70 that the roller 21 drops to the low dwell of said cam, thereby vibrating the lever 23 and shifting the clamp-carrier and the clamping-jaws, thereby shifting the button to present another pair of eyes thereof to the needle. 75 When the required number of stitches have been made through said second pair of eyes, the roller 61 drops to the low dwell of the cam 16, thereby permitting the spring 68 to disengage the clutch 66 from the driving- 80 pulley and to move said clutch toward the lever 73 and retard and eventually arrest the main shaft *a*.

I claim—

1. In a button-sewing machine, the combi- 85 nation of the main driving-shaft, the needle-bar carrier, a rock-shaft operatively connected therewith to shift the same horizontally and driven from the main driving-shaft, a button-clamp mechanism, a cam-wheel driven 90 in a uniform direction from said shaft step by step synchronously with the rocking thereof, said cam-wheel having two cams, a lever for shifting said button-clamp mechanism vibrated by one of said cams, stopping and 95 starting mechanism, and a lever for controlling the latter vibrated by the other cam, substantially as described.

2. In a button-sewing machine, the combination of a shaft extending through the arm 100 of the machine from front to rear, a ratchet-wheel mounted on the front end of said shaft, and suitably driven from the main driving-shaft, a fixed disk behind the rear face of said ratchet-wheel, friction material between 105 said rear face and said disk, a nut on the rear end of the shaft for drawing said wheel toward said disk, a cam-wheel on the rear end of the shaft having a radial groove in its front face, a pin through said shaft arranged to 110 enter said groove to key the cam-wheel to the shaft, and clamp mechanism shifted by said cam-wheel, substantially as described.

3. In a button-sewing machine, the combination of a driving-pulley, a clutch sliding in 115 the main driving-shaft, a lever for shifting said clutch, a slide having an arm engaging said lever, a cam-roller carried by said slide, a cam-wheel driven synchronously with the rotation of the main driving-shaft, a spring 120 interposed between the driving-pulley and clutch and holding said roller to its cam, a stud projecting from the cam-wheel, and a pawl-carrying lever for engaging said stud to rotate said cam-wheel to shift the roller from 125 the low to the high dwell, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ACHILLES GIACOMINI.

Witnesses:

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