

(No Model.)

6 Sheets—Sheet 1.

D. FLANAGAN.  
SEWING MACHINE.

No. 497,644.

Patented May 16, 1893.

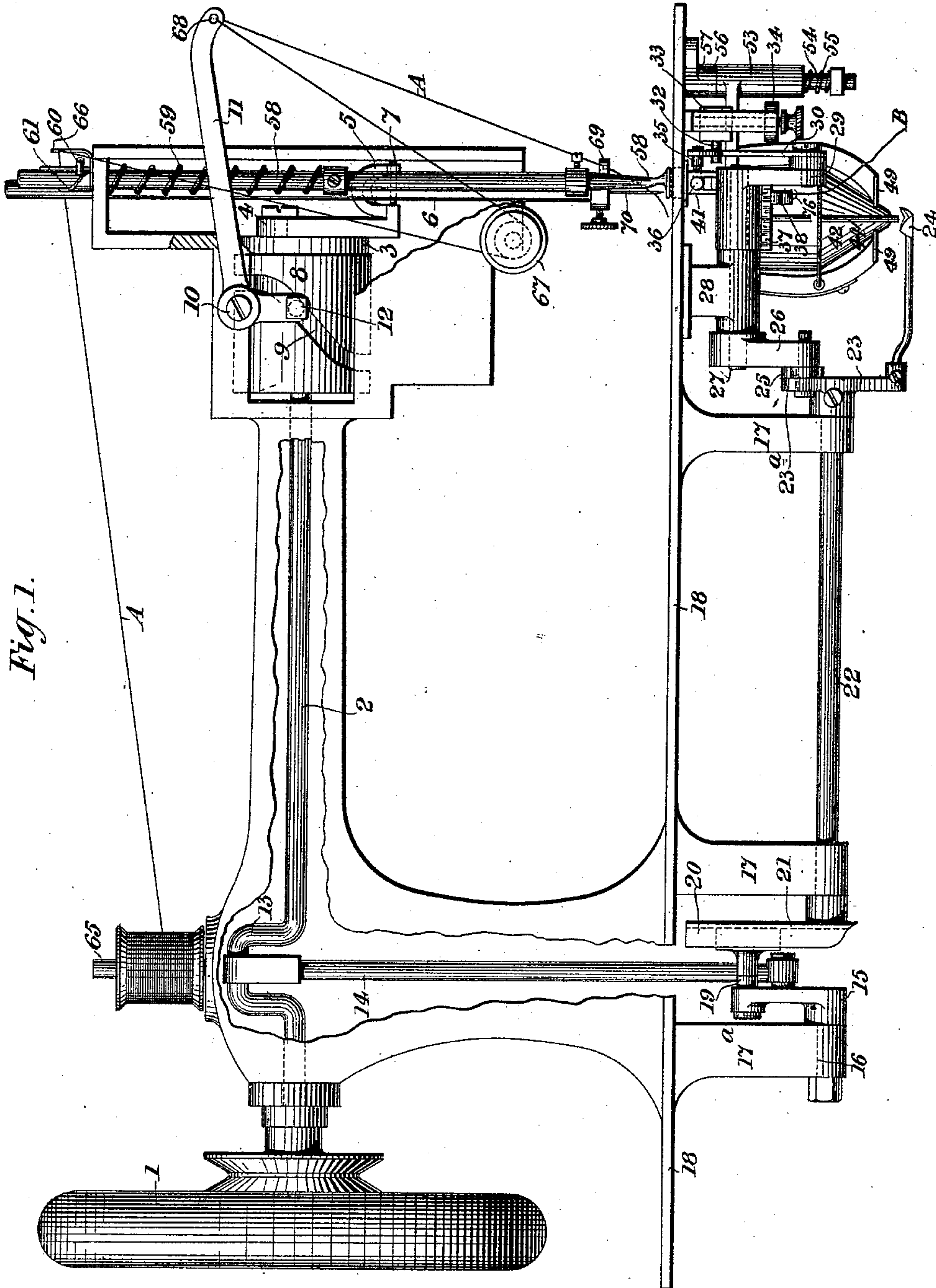


Fig. 1.

Witnesses.  
Walter B. Brierley  
J. Brierley Howard

Inventor.  
Dennis Flanagan

(No Model.)

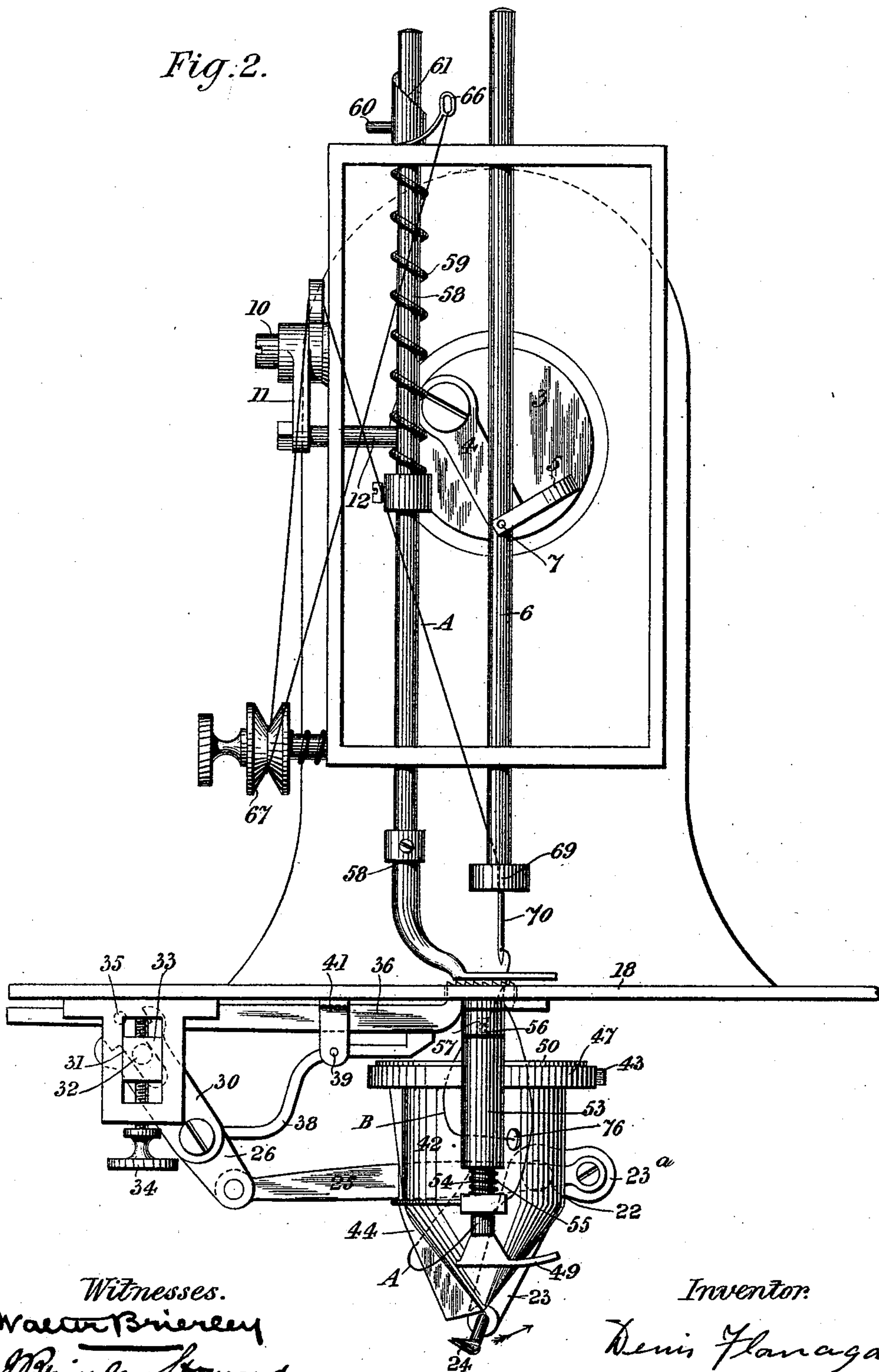
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Fig. 2.



Witnesses.  
Walter Brierley  
J. Brierley Howard

Inventor.  
Denis Flanagan

(No Model.)

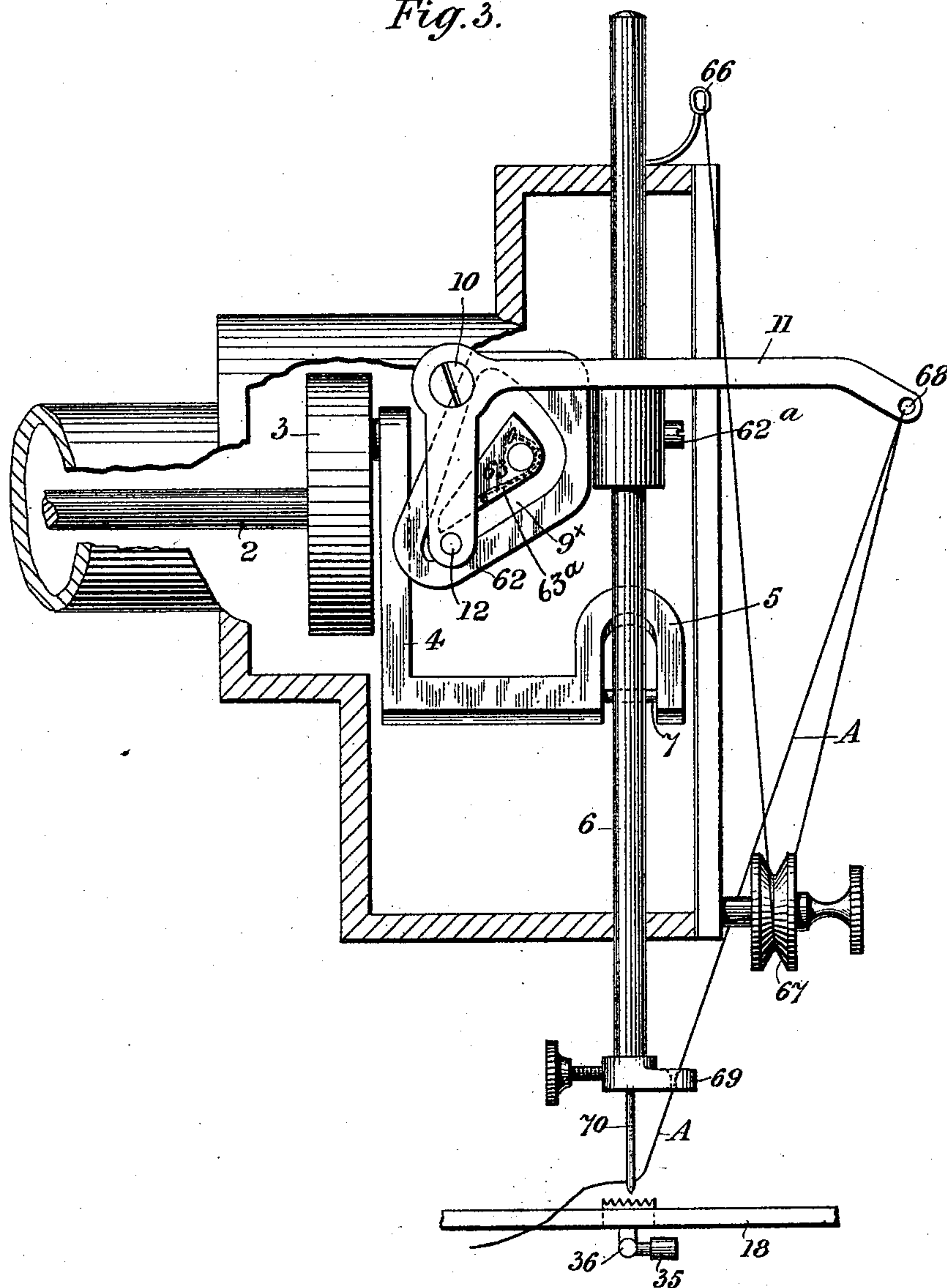
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*Fig. 3.*



*Witnesses.*

Walter Brierley  
J. Brierley Howard

*Inventor:*

Dennis Flanagan



(No Model.)

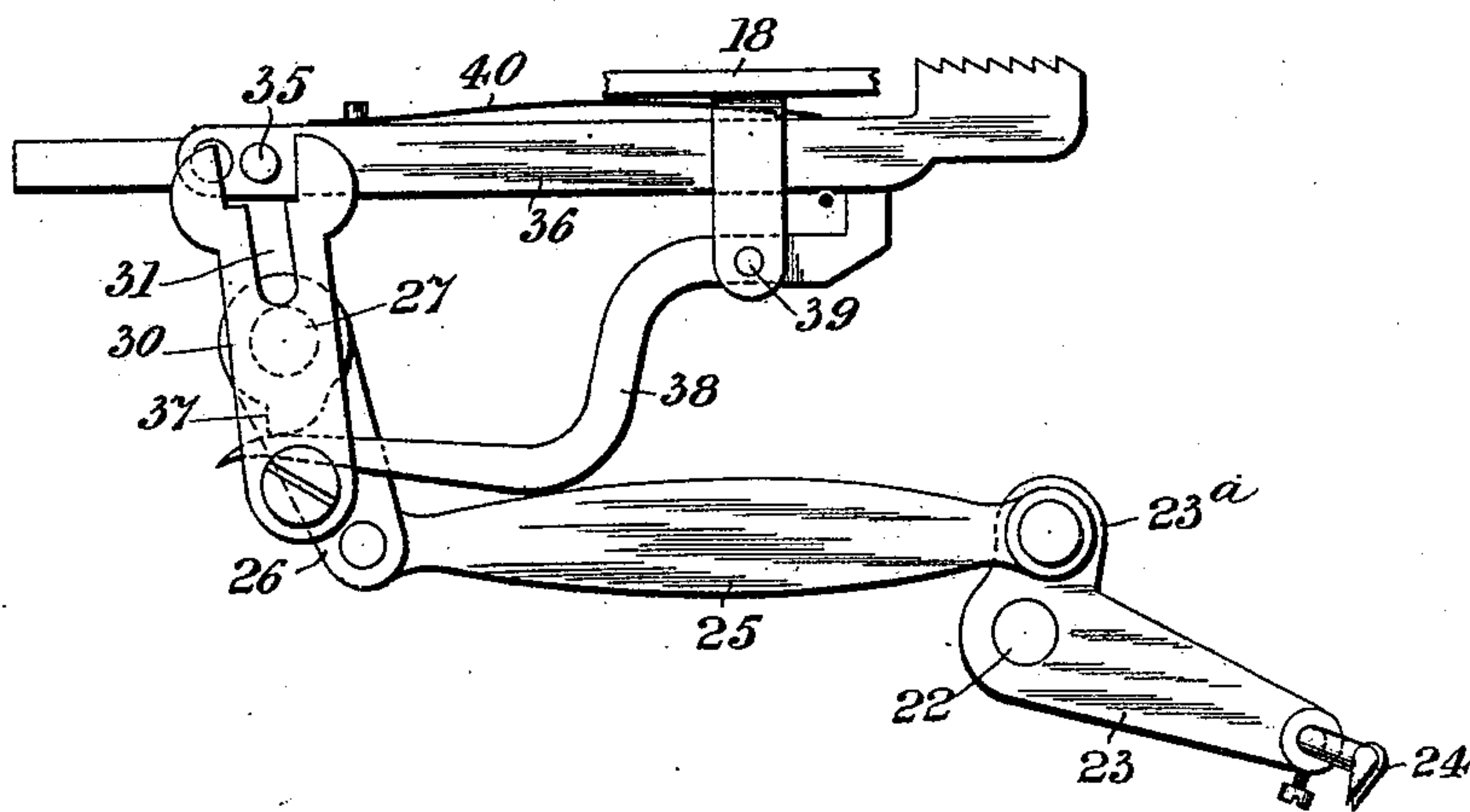
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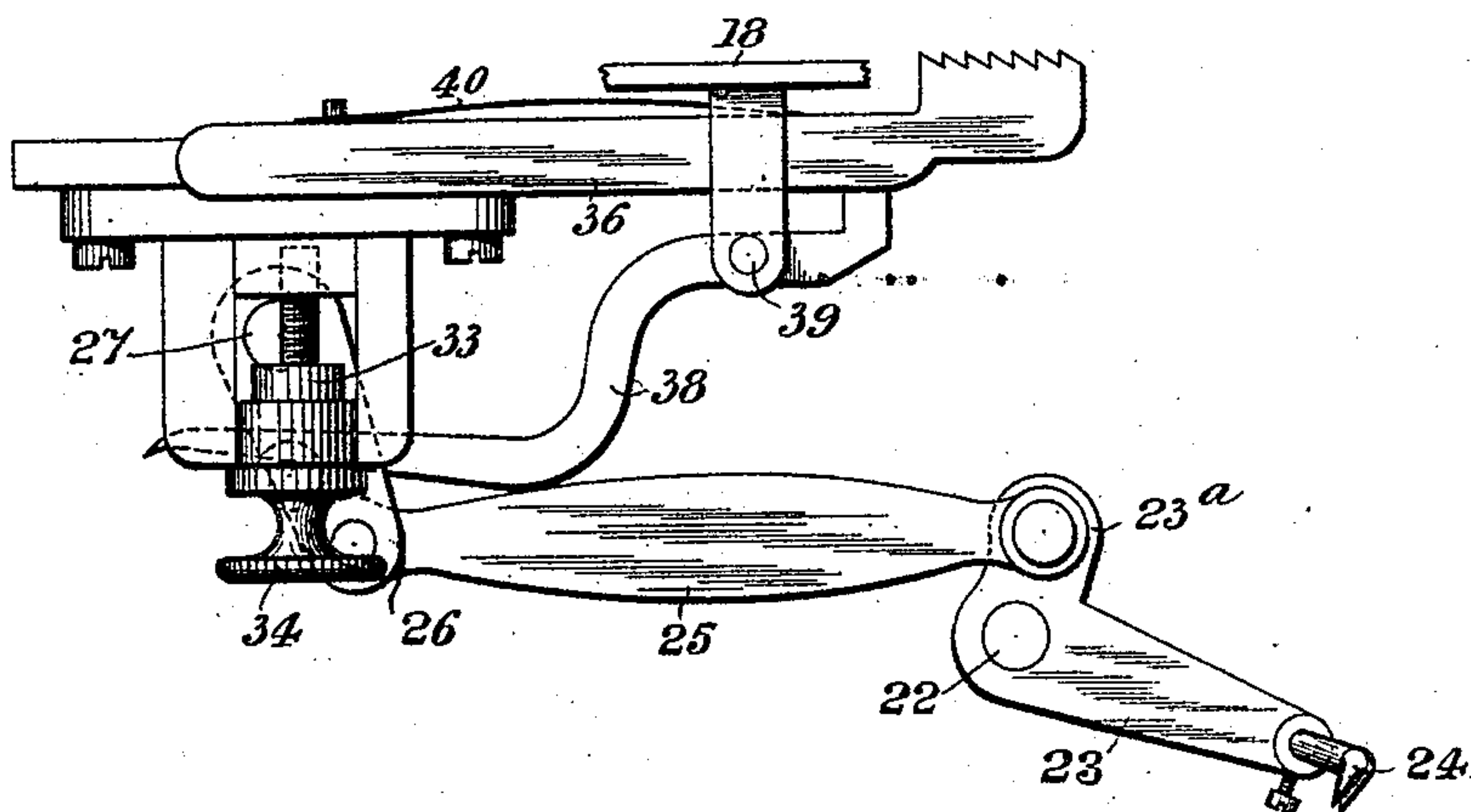
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*Fig. 4.*



*Fig. 5.*



Witnesses.

Walter Brierley  
J. Brierley Howard

Inventor.

Denis Flanagan

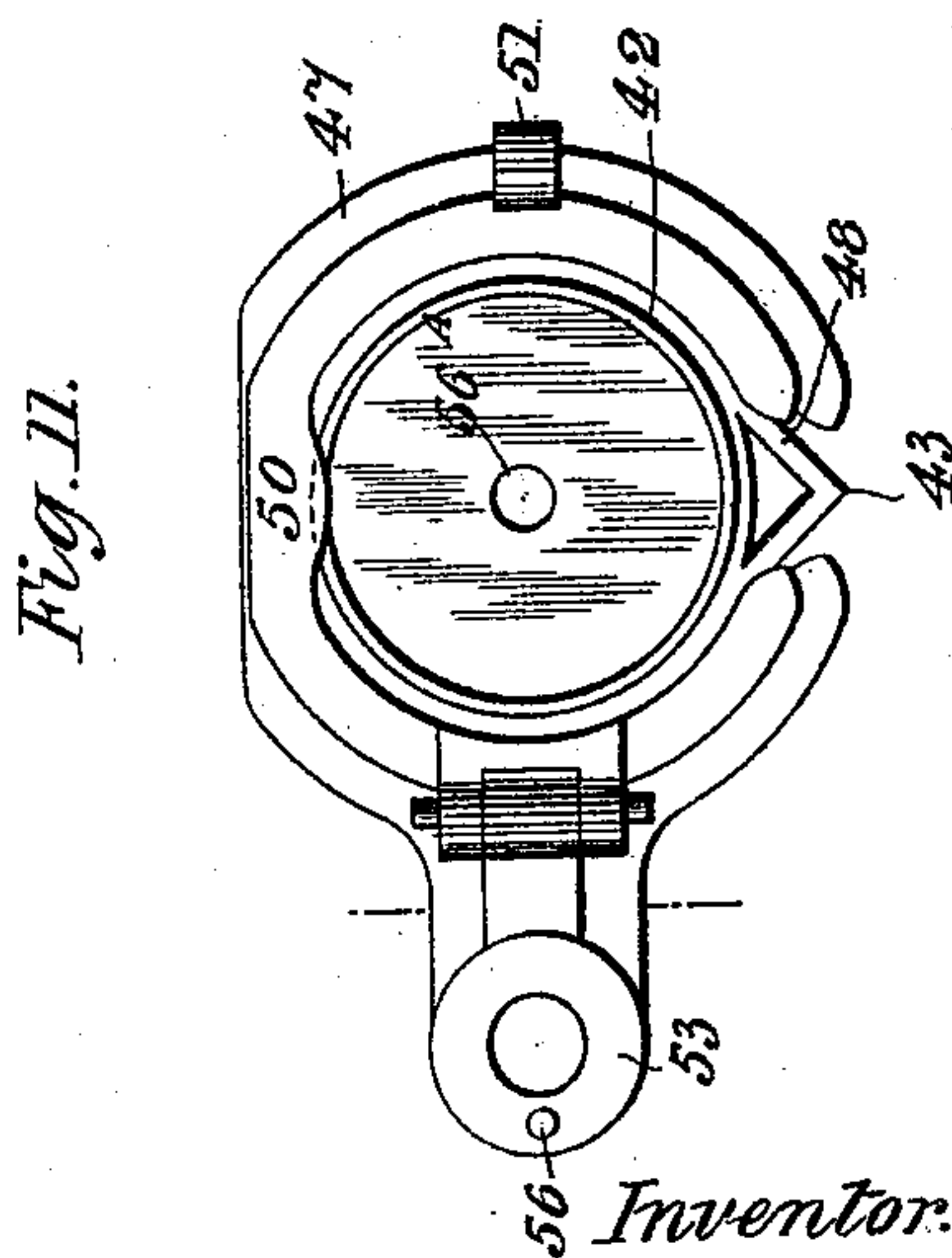
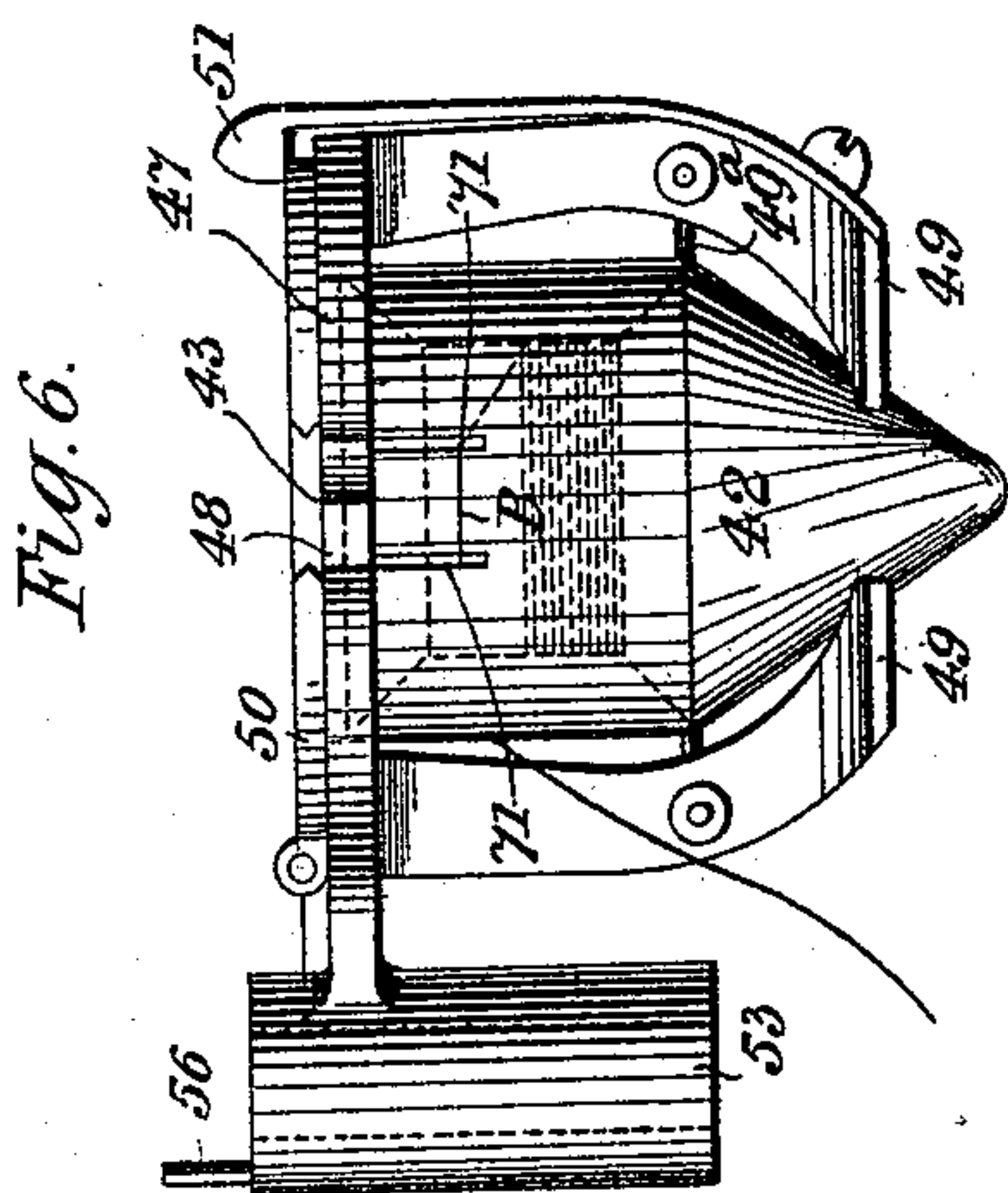
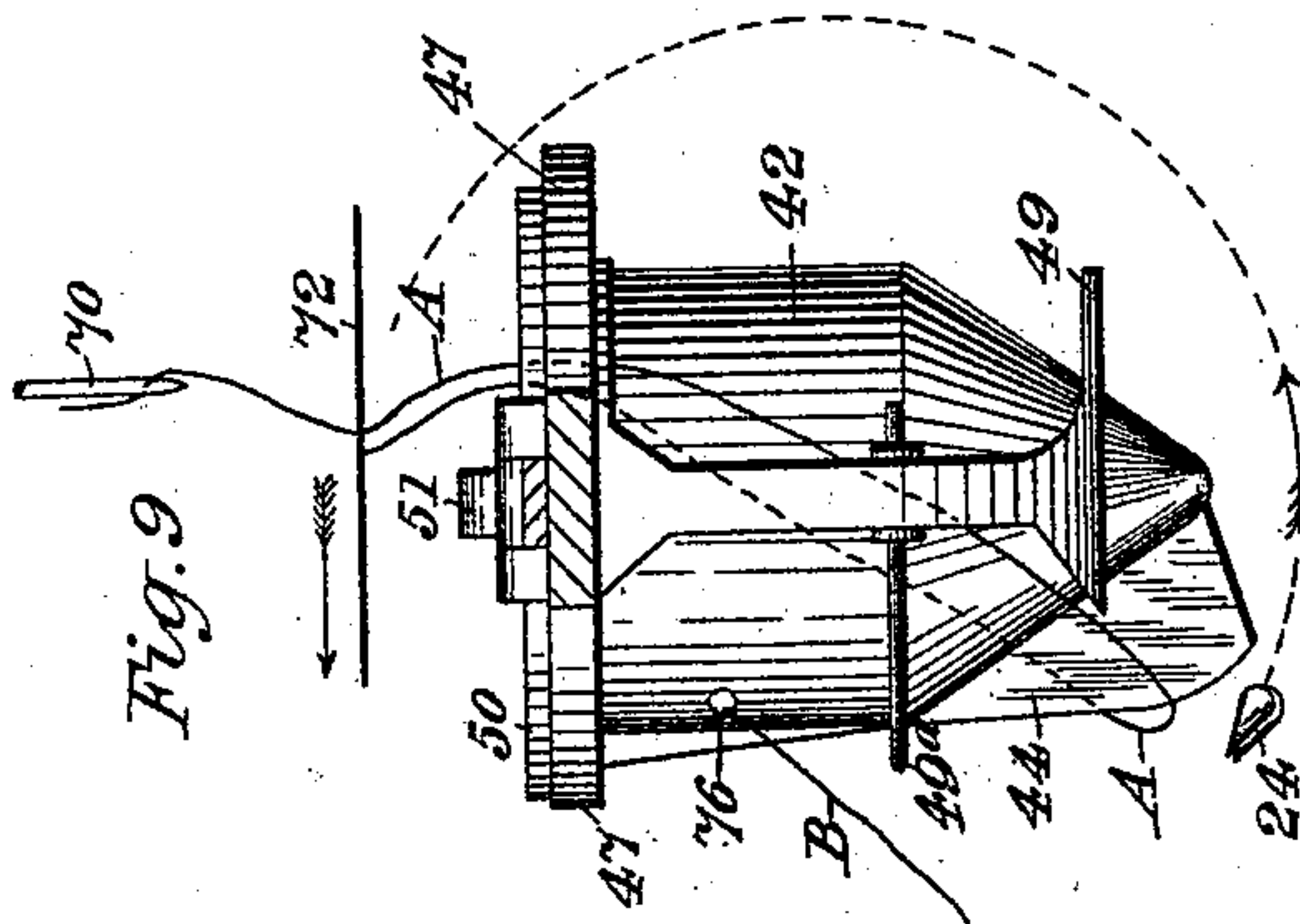
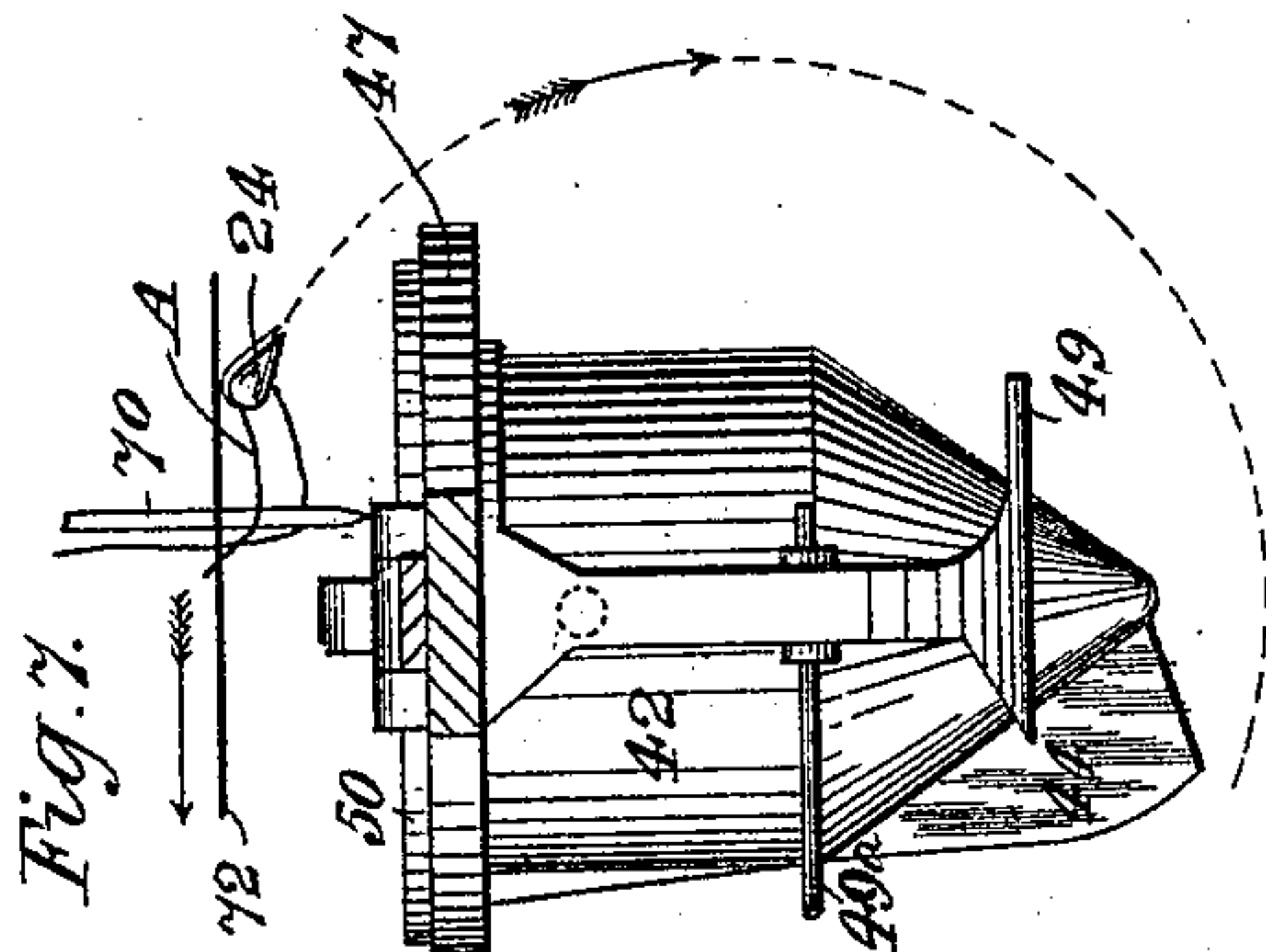
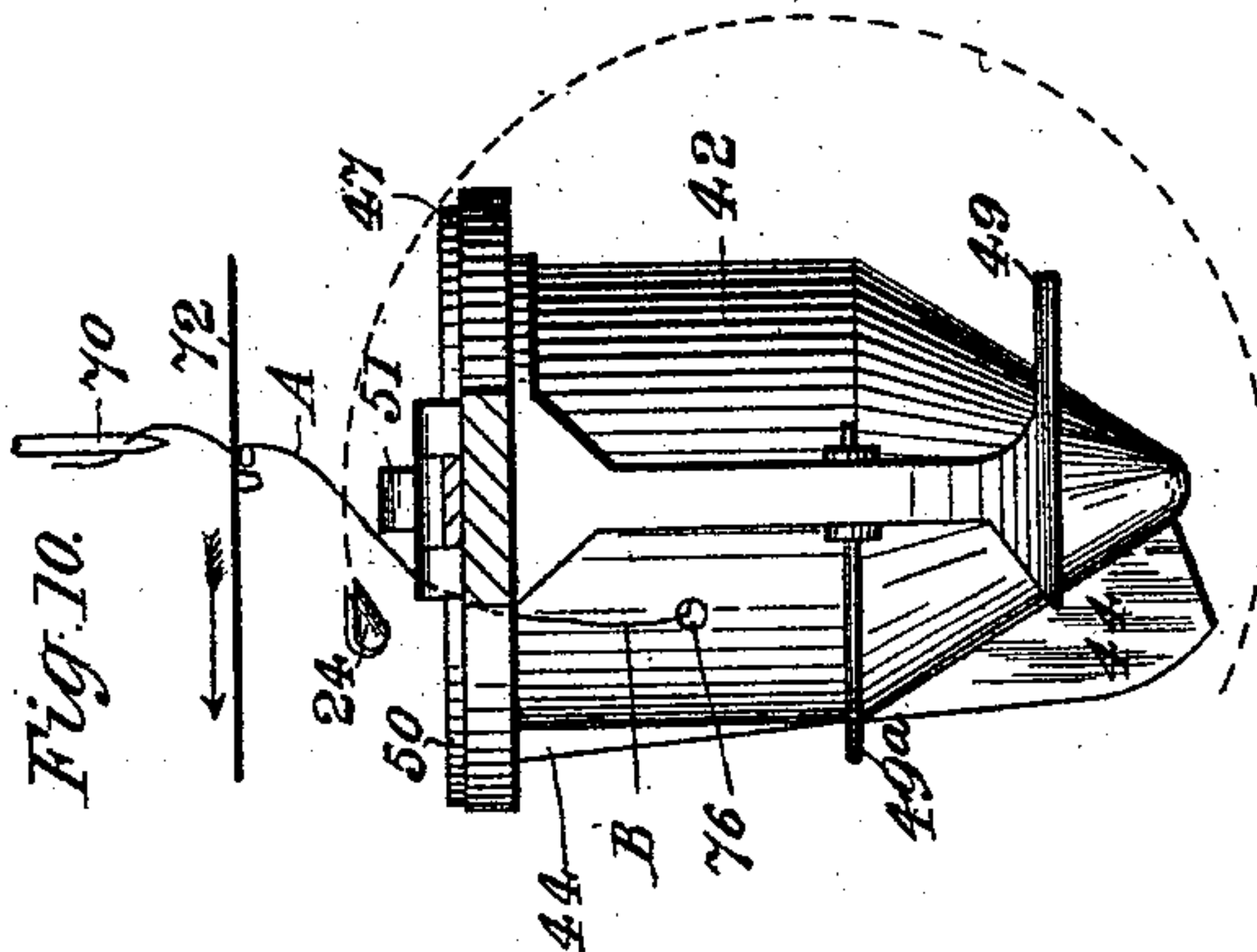
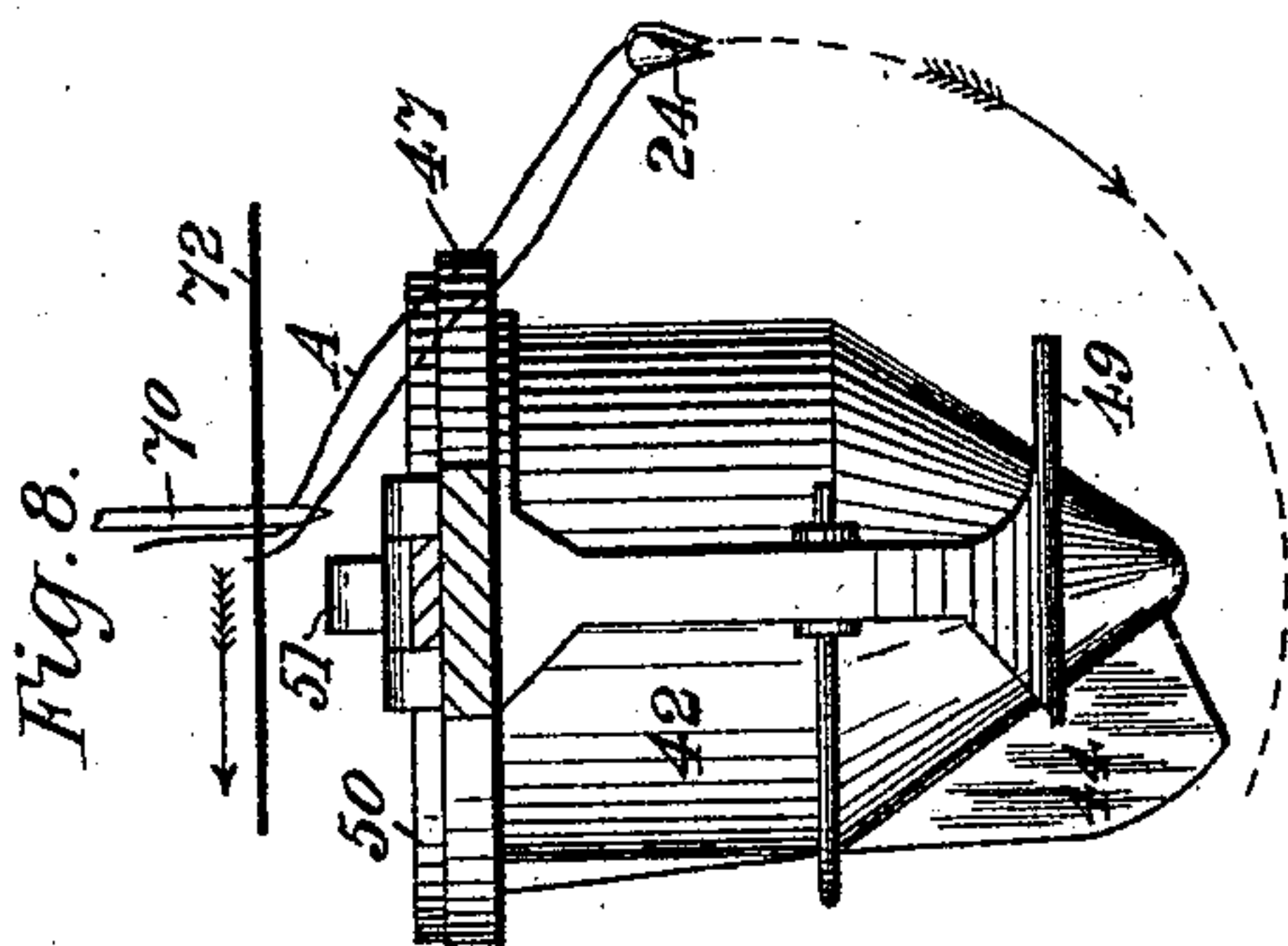
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Witnesses.  
Walter Brierley  
J. Brierley Howard

Inventor.  
Dennis Flanagan

(No Model.)

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Fig. 14.

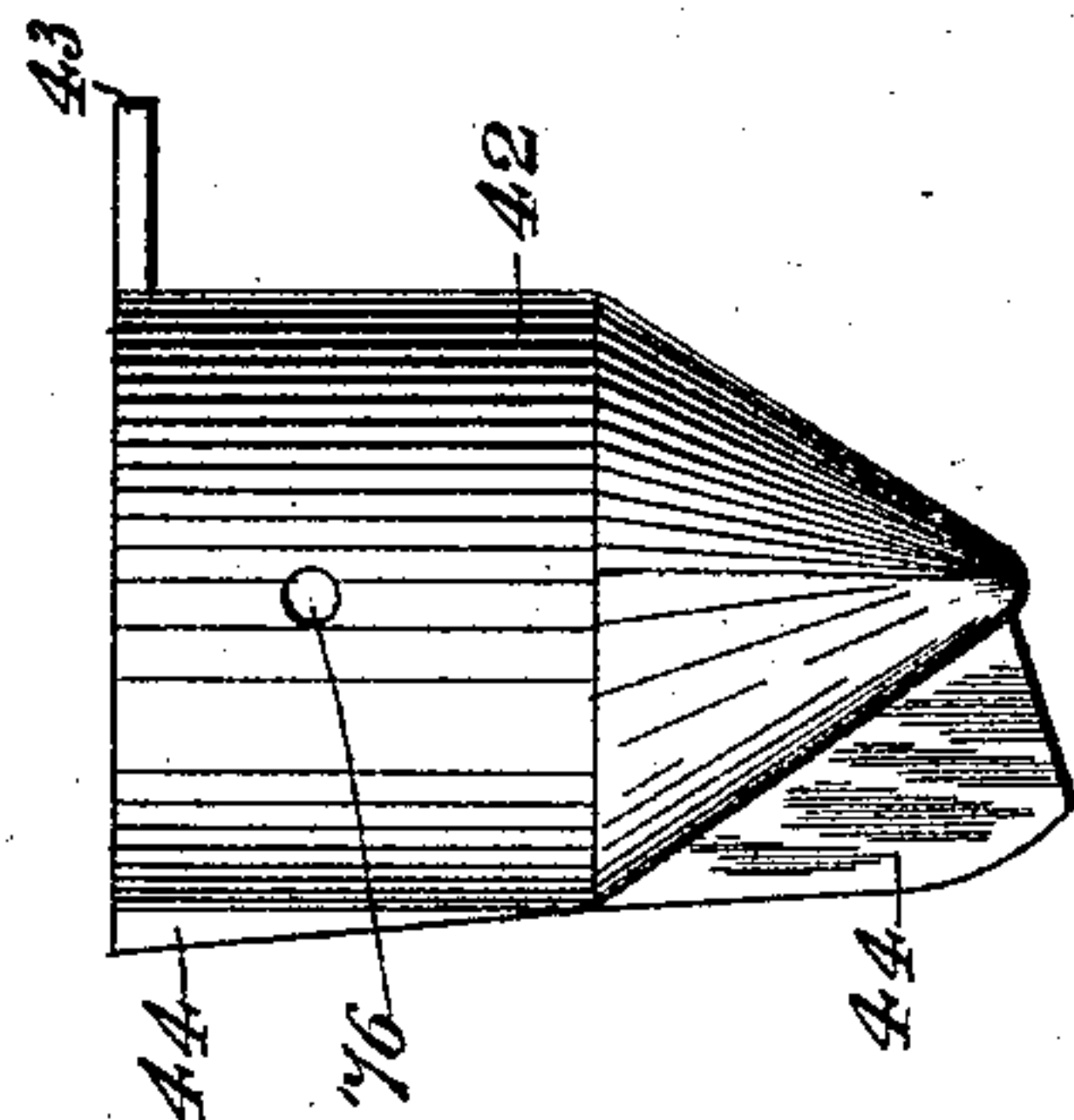


Fig. 16.

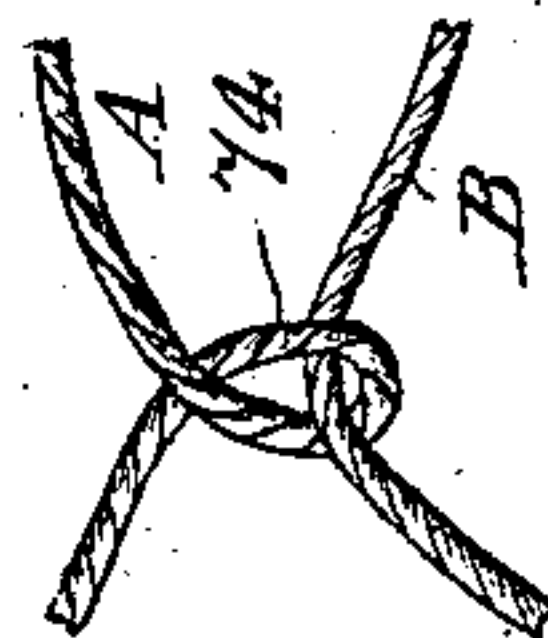


Fig. 13.

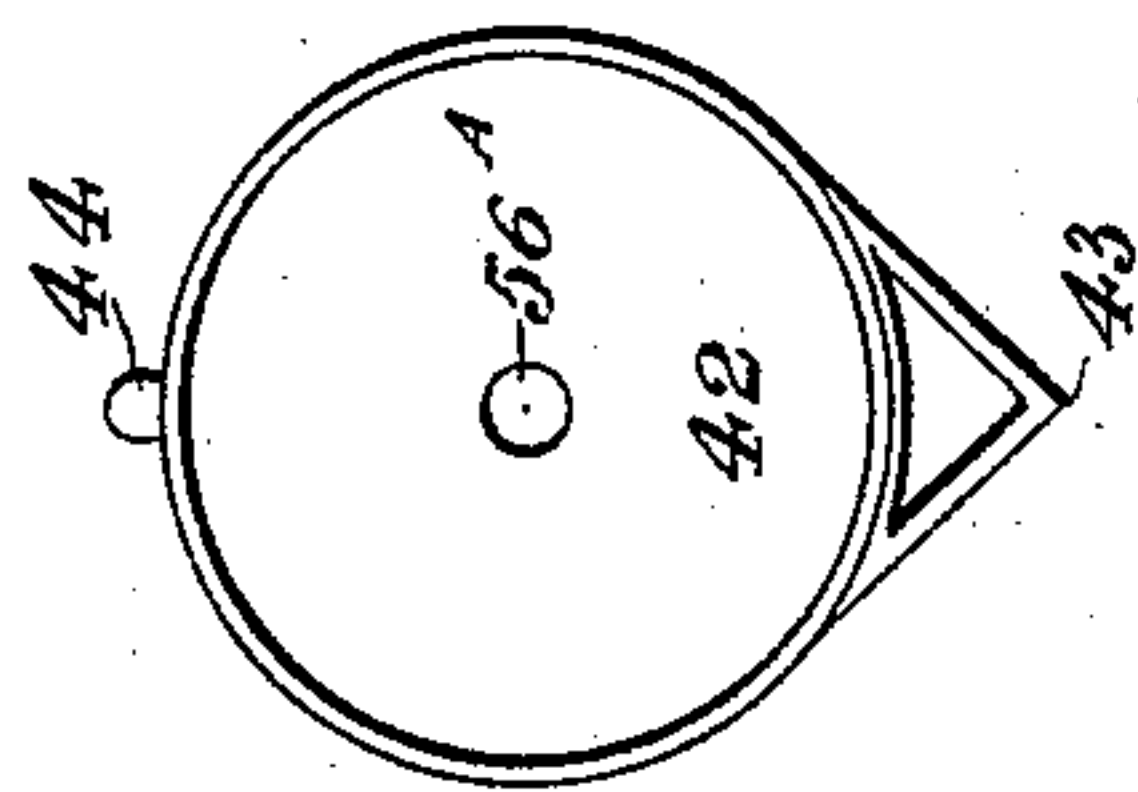


Fig. 15.

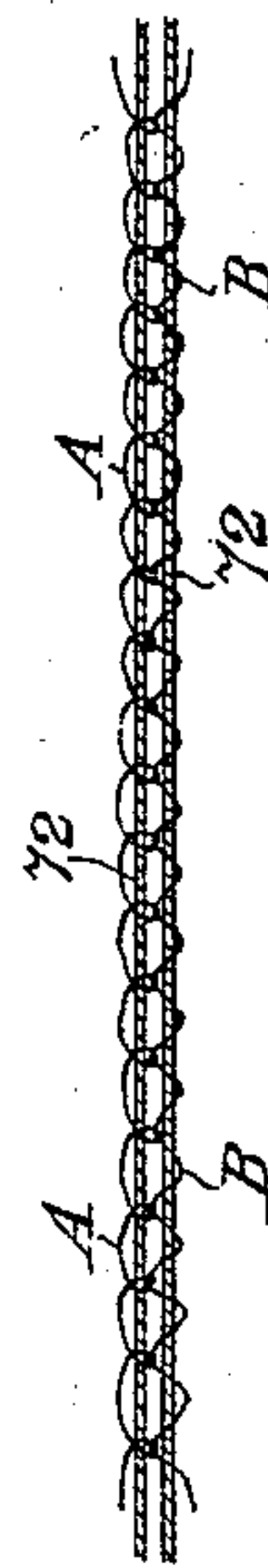
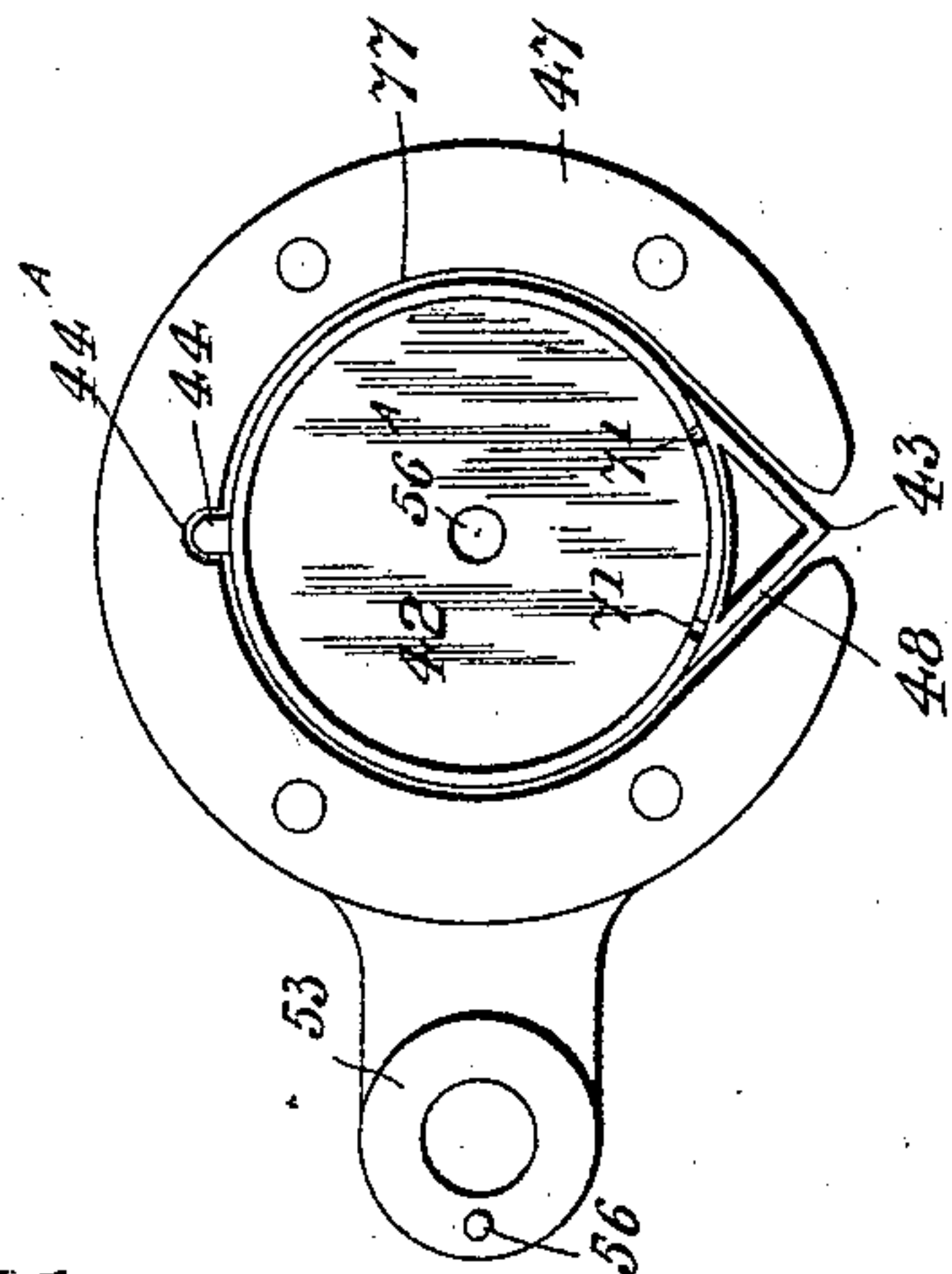


Fig. 12.



Witnesses.

Walter Brierley  
J. Brierley Howard

Inventor.

Denis Flanagan



# UNITED STATES PATENT OFFICE.

DENIS FLANAGAN, OF CLAYTON-LE-MOORS, ENGLAND.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 497,644, dated May 16, 1893.

Application filed October 1, 1892. Serial No. 447,531. (No model.)

*To all whom it may concern:*

Be it known that I, DENIS FLANAGAN, a subject of Her Majesty the Queen of Great Britain, residing at Clayton-le-Moors, in the county of Lancaster, England, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to certain improvements in sewing machines and consists of certain novel means for carrying the spool and forming the loop, the improved spool carrier being adapted for ordinary wood bobbins or reels.

The construction and operation of my invention will be fully described hereinafter and the points of novelty particularly pointed out in the claims.

To clearly explain my invention reference is made to the accompanying drawings in which like numerals of reference designate corresponding parts in the several views.

Figure 1 is a side elevation of a sewing machine having my improvements applied thereto part of the shell of the machine being broken away in order to show the interior. Fig. 2 is an end elevation of Fig. 1 on an enlarged scale. Fig. 3 is a side elevation of part of a sewing machine showing one form of take up bar and operating mechanism. Fig. 4 is an end elevation of the feed motion drawn detached and without the adjustable screw elevator. Fig. 5 is a similar view to Fig. 4 but the adjustable screw elevator is shown. Fig. 6 is a side elevation of the spool or bobbin carrier drawn detached in order more clearly to show its construction the side shown being the opposite to that shown in Fig. 1. Fig. 7 is a front elevation of Fig. 6, a short piece of material being shown under operation and the loop carrier as having taken hold of the thread and commenced to draw the latter round the spool carrier and loop former in the direction indicated by the dotted line and arrow. Fig. 8 is a similar view to Fig. 7 but the loop carrier is shown as having advanced and drawn the thread a little farther. Fig. 9 is another similar view the loop carrier having begun its return movement the thread having slipped off its point onto and partly around the spool carrier and loop former. Fig. 10 shows the top thread as having been

almost entirely drawn up or tightened by the tension bar after the loop formed by the thread has engaged with the bottom thread, or thread carried in the spool carrier and loop former below the bed plate. Fig. 11 is a plan of Fig. 6. Fig. 12 is a similar view to Fig. 11 with the cap or lid for holding in position the conical part of the spool carrier removed. Fig. 13 is a plan view of the shell part of the spool carrier drawn detached in order more clearly to illustrate its construction. Fig. 14 is a front elevation of Fig. 13. Figs. 15 and 16 are diagrams showing respectively on a large scale two pieces of material stitched together and the relative positions assumed by the two threads when the material is stitched.

At 1 is a hand wheel for operating the machine but it will be obvious that this wheel may be turned by foot or other power.

2 is the main shaft driven by the wheel 1 and on one end of this shaft 2 is a disk 3 (see Figs. 1 and 2) on which is loosely mounted the link 4 the outer end of which is cranked, and forms a clip 5 which partly incloses the needle bar 6 and is attached thereto by pin 7. Behind the disk 3 and on the shaft 2 is the boss 8 in the circumference of which is formed the cam groove or race 9.

Mounted on a fulcrum pin 10 outside the shell or frame of the machine is the take-up bar 11 which consists of a bell crank lever and through the short arm of such lever or bar 11 is fixed the pin 12 the end of which extends into the cam groove or race 9.

On the main shaft 2 I form a crank 13 operating a vertical pitman 14 the lower end of which is attached to a pin situated about the middle of the crank 15 the latter being carried by the pin 16 fixed in the bracket 17<sup>a</sup> cast to the under side of the bed plate 18. The outer end of the crank 15 carries a pin and slide piece 19 and the latter works in the groove or slide bed 20 in the crank 21 fixed on the bottom shaft 22 the latter being carried by the brackets 17 cast to the under side of the bed plate 18 of the machine. The effect of this action is to give a rocking motion to the shaft 22. The end of the bottom shaft 22 carries the cranked lever 23 in one arm of which is fixed the loop carrier 24 while the other short arm 23<sup>a</sup> of the same is by link 25 attached to the crank 26 fixed on the short



shaft 27 carried in the bracket 28 fixed to the under side of the bed plate 18. On the end of the shaft 27 is a crank 29 (see Fig. 1) which operates the crank 30 in which is the long slot 31 (see Fig. 4) and in this slot 31 is received the regulating pin 32 carried in the block 33 which is adjusted by the screw elevator 34 so that as the regulating pin 32 is moved by the screw elevator nearer to or farther from the center of motion of the crank so will a greater or less amount of motion be imparted to the slotted crank 30. A second pin 35 (see Figs. 1 and 4) is received in the slot 31 and this pin 35 is fixed to the sliding serrated feed bar 36 and gives the requisite to and fro motion to said feed bar. When the feed bar 36 moves in a forward direction, or in the direction in which the material under operation passes, it is necessary that the serrations should protrude slightly above the bed plate 18 so that the serrations lay hold of the material and carry it forward in the usual way. To cause the serrations to protrude at the right time I employ a tappet 37 on the short shaft 27 and this tappet 37 acts on one end of a curved lever 38 mounted on a fulcrum stud 39 and the other end of the curved lever 38 acts on the serrated end of the feed bar 36 slightly lifting same. A spring 40 (see Figs. 4 and 5) causes the feed bar 36 and curved lever 38 to resume their normal positions when not acted upon by the tappet 37, the spring 40 bearing against the under side of the bed plate 18. The feed bar 36 is carried loosely in bearings 41 fixed to the under side of said bed plate 18.

The spool or reel carrier and loop former consists of a cylindrical shell 42 the bottom of which is of the shape of an inverted cone, and at the top and front of the shell is a V-shaped projection 43. At the back of the shell 42 is a vane 44 which extends to the top of the shell and when the latter is in position in a frame the upper end of the vane 44 is received in a recess 44<sup>a</sup> (see Fig. 12) in such frame. The frame is merely a skeleton and consists of a ring 47 at the top, which ring is cut away, or an opening 48 left in it and in this opening 48 the end or point of the V projection 43 is received. The bottom of the shell 42 rests between and on the two guides 49, 49 braced apart by a bent rod 49<sup>a</sup> and a hinged annular ring or cover 50 holds the shell 42 in position said ring or cover 50 being held down on the frame by the spring catch 51. The ring 47 of the frame has a sleeve 53 cast to it and this sleeve 53 is received on the stud 54 (see Figs. 1, 2 and 11) fixed to the under side of the bed plate 18 and on the stud 54 beneath the sleeve 53 is a spiral spring 55 which allows of the frame 45 and shell 42 being depressed until the pin 56 on the sleeve 53 is withdrawn from the hole 57 in the flange of the stud 54 or in the bed plate 18 so that the frame and shell 42 can readily be turned round on the stud 54 until

the shell 42 is directly under a sliding door or opening made in the bed plate 18 so that a reel or bobbin can readily be inserted or removed from the interior of the shell 42 which is provided with a central spindle 56<sup>a</sup> on which the reel or bobbin is placed. 58 is the ordinary pressure foot held in the down position by the spring 59 and raised by moving the pin 60 up the incline 61 fixed to the shell of the machine.

The preferred mechanism for operating the take-up bar 11 is shown in Fig. 3 where the pin 12 works in the cam race or groove 9<sup>x</sup> formed in the lug 62 which is fixed on the needle bar 6 by a set screw 62<sup>a</sup> and as the latter rises and falls the cam groove or race 9<sup>x</sup> gives through the pin 12 the requisite motion to the take-up bar 11.

At 63 is a switch pressed downwardly in the position shown, by a spring 63<sup>a</sup> (shown in dotted lines) so that when the machine is set in motion and the pin 12 is caused to travel down the groove 9<sup>x</sup>, as it passes from under the switch 63 the said spring 63<sup>a</sup> will turn the switch down upon the lower side of the groove and thus cause the pin 12 to travel always in the same direction and it will be obvious that in this case the hand or other wheel 1 should be always turned in one and the same direction. When apparatus as shown by Figs. 1 and 2 is employed whichever way the hand or other wheel 1 is turned the remaining parts of the machine always turn in one (the working) direction.

The pin 35 is preferably covered with rubber or other soft material to deaden the noise or rattle caused by the sides of the slot 31 coming in contact therewith.

It will be obvious that ordinary wooden reels or bobbins of any size less than the interior of the shell 42 can be employed in connection with the machine.

The action is as follows:—A reel or bobbin containing thread marked A is carried on a spindle 65 on the top of the machine. A second reel or bobbin containing thread is placed in the reel container 42 and the thread from this reel is marked B. The thread A passes from its reel through the guide eye 66 to and round an ordinary tension 67 thence through the eye 68 in the take-up bar 11 to and through the eye in the guide 69 and afterward through the eye in the needle 70. The thread B passes from its reel out and back again through the slots 71, 71 (see Fig. 6) in the shell 42 (which slots put a little "drag" on the thread) and out again through the hole 76 in the shell 42. Both threads A and B are brought to the top of the bed plate either by giving a few turns to the wheel 1, or by "threading." The material 72 to be stitched is then placed in position in the ordinary manner and the wheel 1 is then continuously turned. When the needle has passed the thread A through the material the hook or loop carrier 24 lays hold of the thread between the eye of the needle and



the material under operation (see Fig. 7) the take-up bar being at its lowest position. Consequently the thread between the eye of the take-up bar 11 and the eye of the needle 70 is slack. The hook or loop carrier moves rapidly for the space of rather more than half a circle (as indicated by dotted lines and arrows) and when about half its movement is completed (see Fig. 8) the loop of the thread A is divided and crossed by the V projection 43 owing to the double fork formation of the hook 24 which keeps the doubled threads apart (see Figs. 1 and 8). When the hook 24 has moved to its limit in one direction (see Fig. 9) the thread slips off the same and after passing between the guides 49, 49 will be found to be looped round the shell or loop former 42. The take-up bar 11 now ascends (through the action of the cam 9) and draws up the slack thread and loop the latter being passed under and around the thread B (see Figs. 9 and 10) and escaping from the loop former by way of the passage or space 77 between the shell 42 and the annular ring 47 the loop is drawn quite tight, the thread B being tightened by the drag put upon it.

It will be seen by referring to Fig. 15, where two pieces of material are shown (diagrammatically) as being stitched together that the thread is passed through the material and that when the loop is drawn up tight it (the loop) is between the upper and lower material the thread A forming a crossed loop 74 (see Fig. 16) through which the thread B passes.

The take up mechanism herein described is not claimed in this application, but is claimed in a separate application entitled "improvements in take-ups for sewing-machines" which was filed March 6, 1893, and serially numbered 464,860."

The feed mechanism herein described is not claimed in this application, but is claimed in a separate application entitled "improvements in feeding devices for sewing-machines" which was filed February 24, 1893, and serially numbered 463,551.

What I claim in this specification, and de-

sire to secure by Letters Patent of the United States, is—

1. In a sewing machine, a spool receptacle having a point to divide the loop of thread, a frame for holding said spool receptacle consisting of an open annular portion 47, and guides 49 secured thereto, an open annular cover hinged upon the said frame, a spring catch for holding the same down, a sleeve 53 secured to the said frame, a stud 54 secured to the bed plate upon which the said sleeve is free to turn, a boss upon the said stud a pin upon the said sleeve and a recess in the boss for the said pin to engage to hold the frame from rotation round the stud, and a spring upon the stud to bear upon the sleeve, and hold the pin in engagement with the recess, so that by pressing down upon the said sleeve the spool receptacle may be swung round to remove the spool, substantially as and for the purposes described.

2. In a sewing machine, the combination with a spool receptacle having a point to divide the loop of thread, a frame for holding said spool receptacle consisting of an open annular portion 47, and guides 49 secured thereto, an open annular cover hinged upon the said frame, a spring catch for holding the same down, a sleeve 53 secured to the said frame, a stud 54 secured to the bed plate upon which the said sleeve is free to turn, a boss upon the said stud a pin upon the said sleeve and a recess in the boss for the said pin to engage to hold the frame from rotation round the stud, and a spring upon the stud to bear upon the sleeve and hold the pin in engagement with the recess of a looper and means for operating the same to cause the loop to pass around the spool receptacle, substantially as and for the purposes described.

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

DENIS FLANAGAN.

Witnesses:

WALTER BRIERLEY,  
J. BRIERLEY HOWARD.