

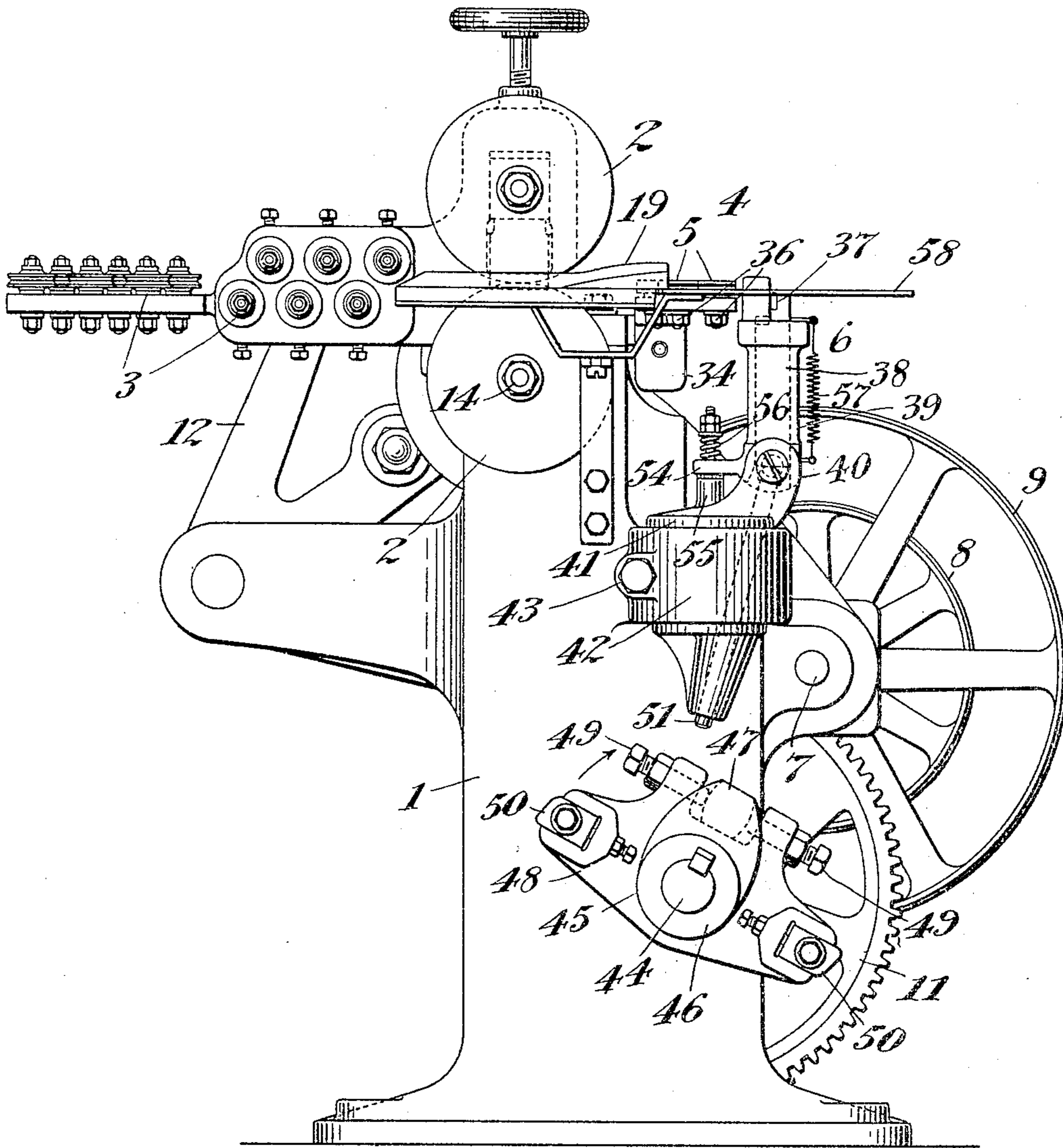
No. 778,472.

PATENTED DEC. 27, 1904.

O. S. BEYER.
RING MAKING MACHINE.
APPLICATION FILED APR. 15, 1903.

5 SHEETS—SHEET 1.

Fig. 1



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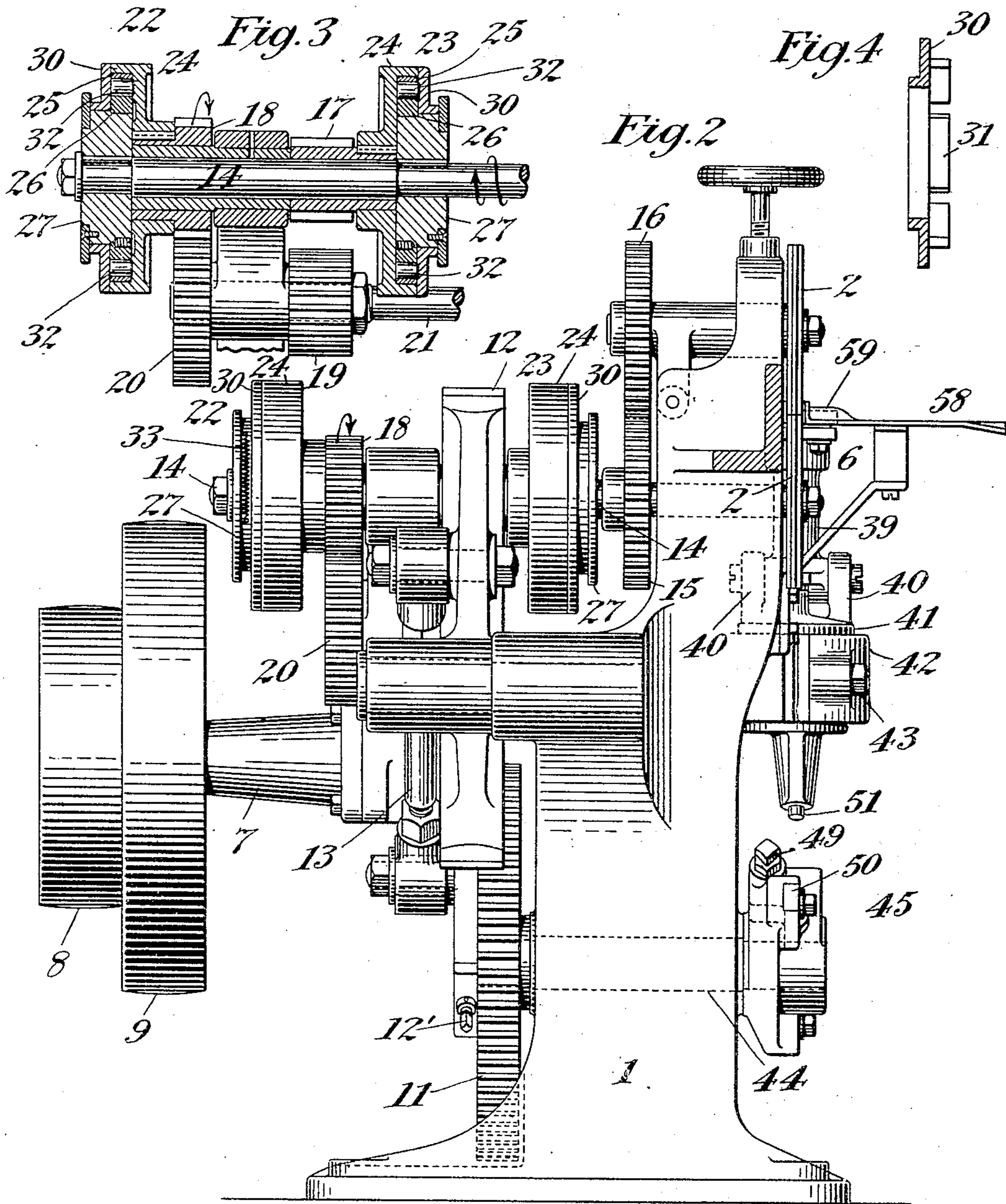
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5 SHEETS—SHEET 2.



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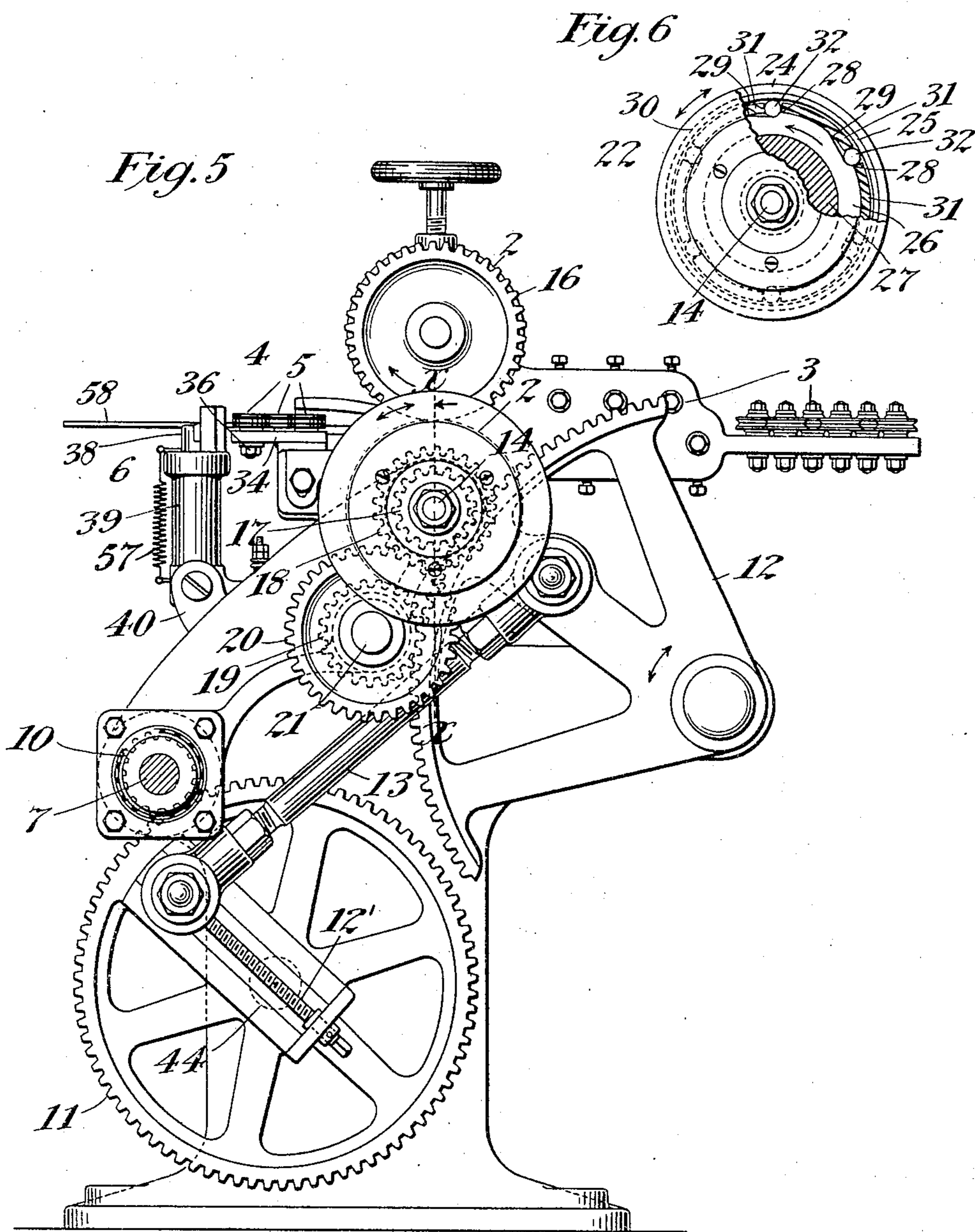
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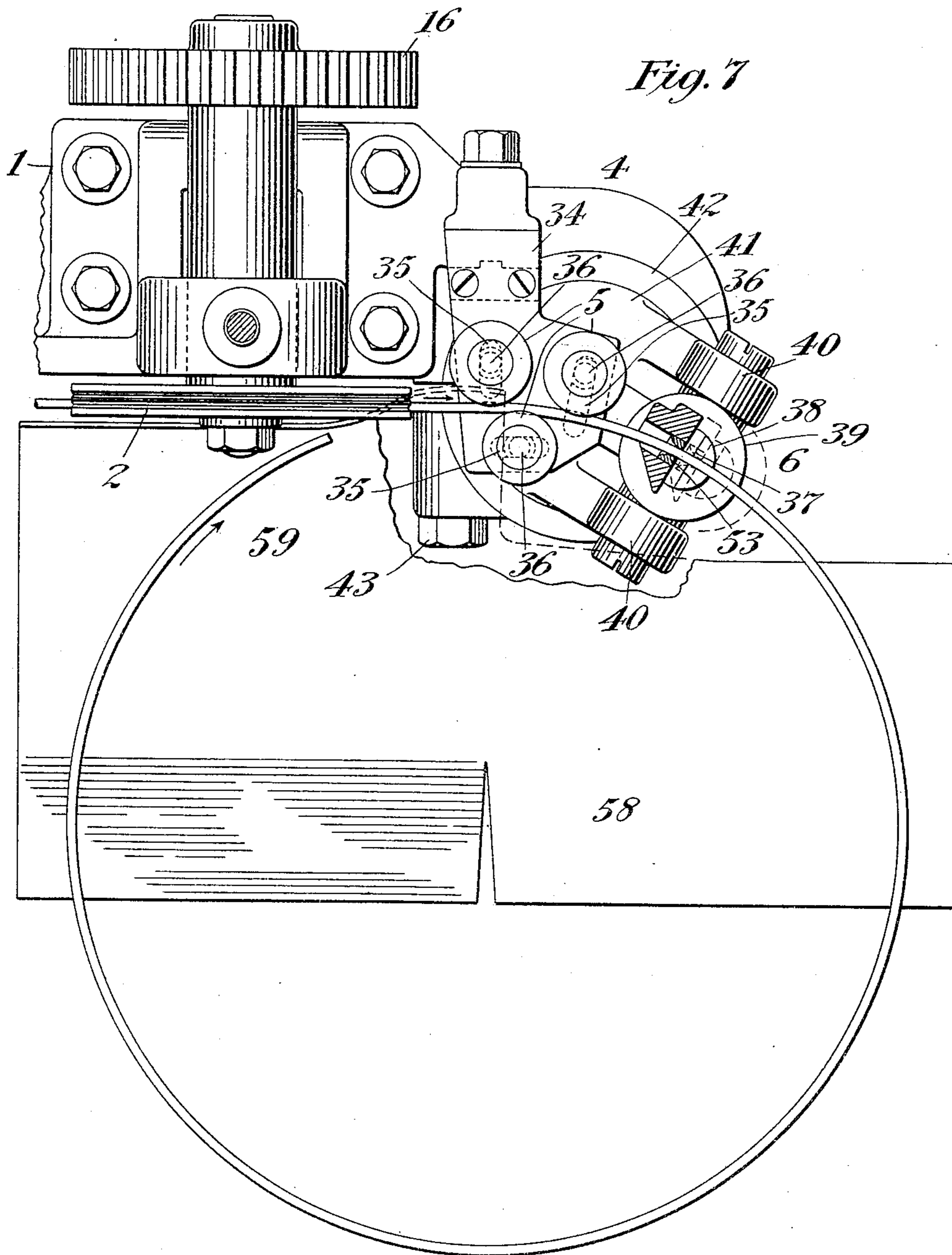
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5 SHEETS—SHEET 4.



Witnesses:

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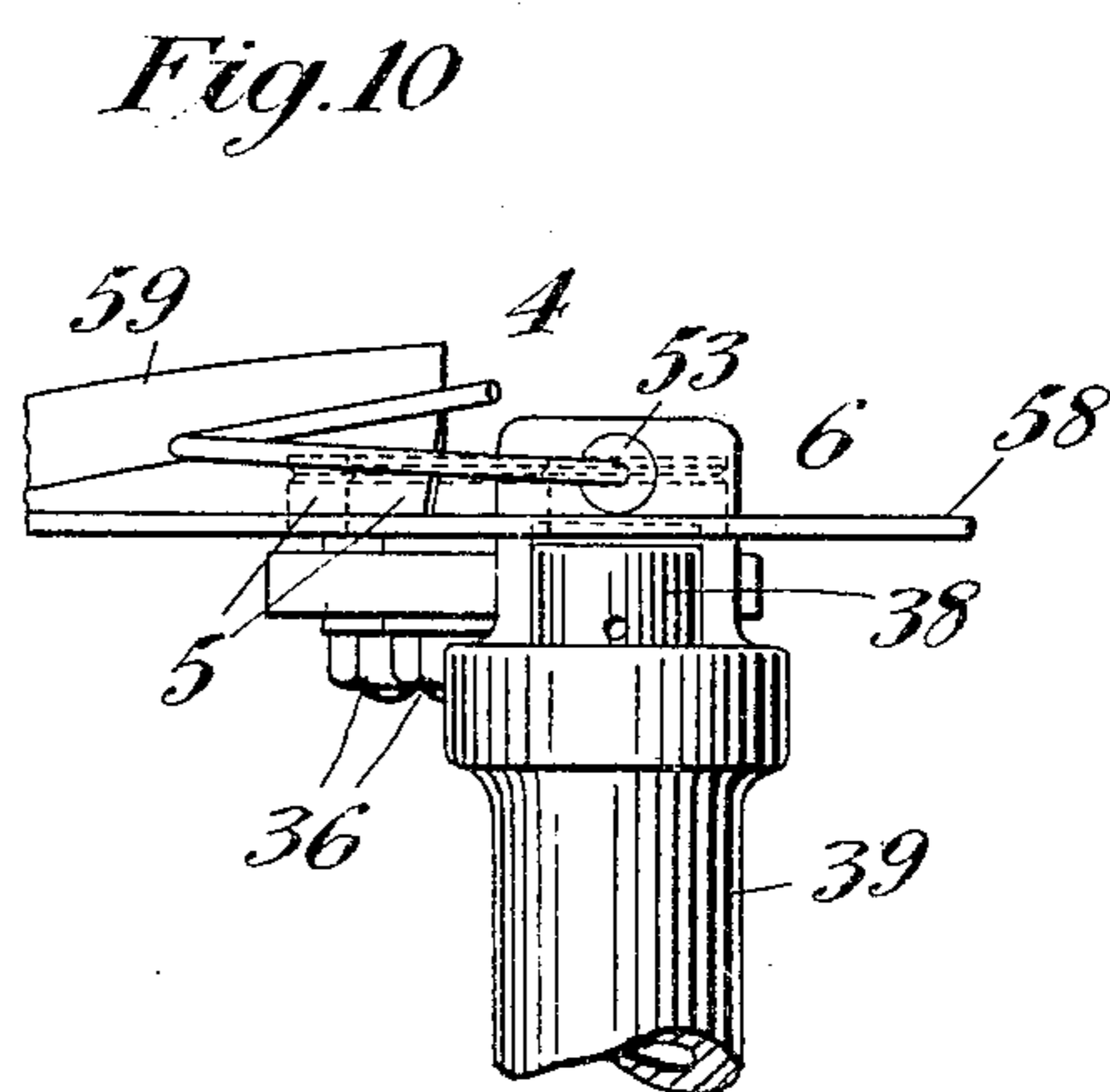
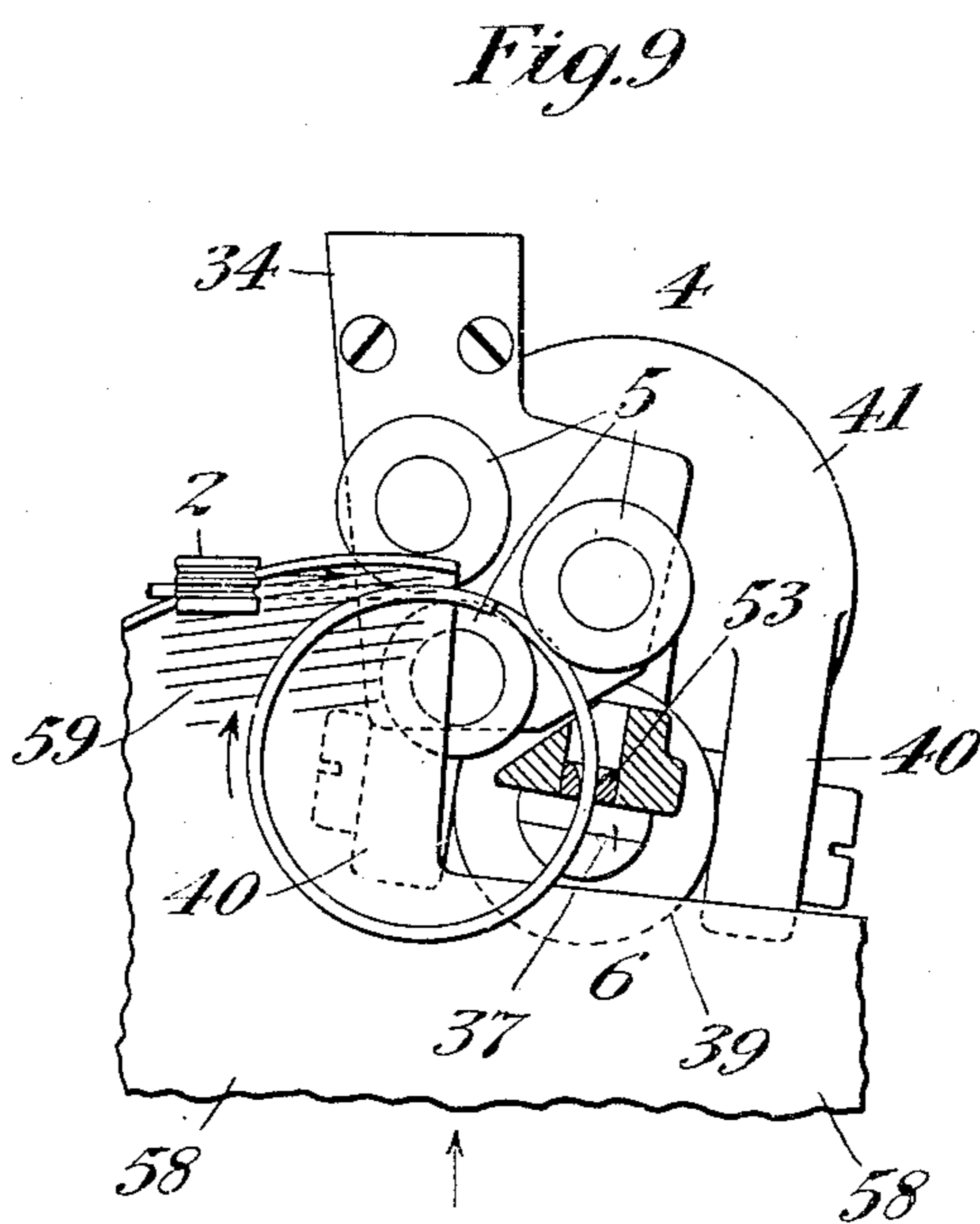
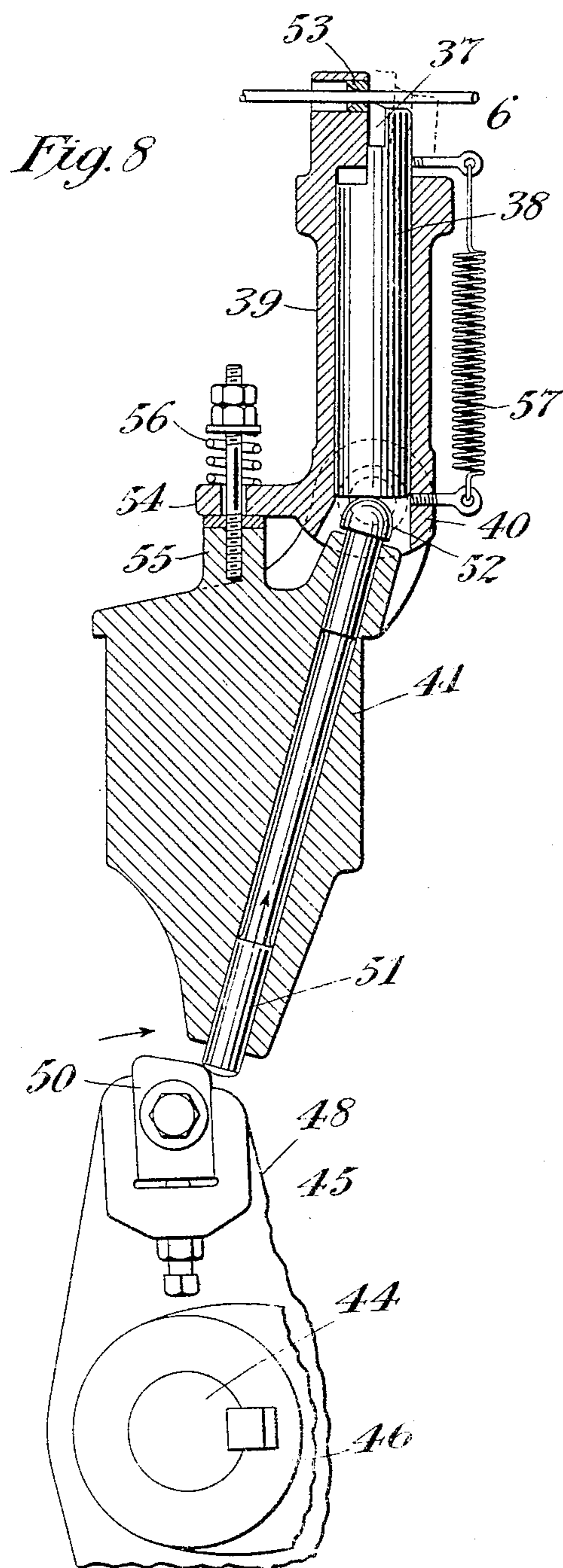
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SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

OTTO S. BEYER, OF EAST RUTHERFORD, NEW JERSEY, ASSIGNOR TO E. W. BLISS COMPANY, A CORPORATION OF WEST VIRGINIA.

RING-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 778,472, dated December 27, 1904.

Application filed April 15, 1903. Serial No. 152,718.

To all whom it may concern:

Be it known that I, OTTO S. BEYER, a citizen of the United States of America, and a resident of East Rutherford, county of Bergen, and State of New Jersey, have invented certain new and useful Improvements in Ring-Making Machines, of which the following is a specification.

My invention relates generally to wire feeding and bending machines, and has more particularly reference to wire-ring-making machines.

The special object of my invention is to produce a structure capable of adjustment to form one or more wire rings of variable sizes during a certain period from a strand of wire fed substantially uninterruptedly. Other objects will appear as the specification proceeds; and to this end my invention comprises the features of construction and arrangement of parts, as will be more fully hereinafter described.

I shall describe a wire-ring-making machine embodying my invention, and afterward point out the novel features in my claims.

In the drawings I have shown my invention in one form; but changes of construction may of course be made without departing from the spirit of my invention.

In the said drawings, Figure 1 shows a front view of a machine embodying my invention. Fig. 2 is a side view of the same. Fig. 3 is a sectional view, on the line *xx* of Fig. 5, of the clutch mechanism for operating the feed-rolls. Fig. 4 is a detailed view of part of the said clutch mechanism. Fig. 5 is a rear view of the machine. Fig. 6 is a side view, partly broken away, of one of the clutches shown more particularly in Fig. 3. Fig. 7 is a plan view of the feed-rolls and wire-bending mechanism. Fig. 8 is a vertical sectional view through the cutting mechanism. Fig. 9 is a plan view of the wire-bending mechanism, showing the parts adjusted to form a smaller-size ring. Fig. 10 is a view in elevation of the cutting mechanism.

Similar characters of reference denote corresponding parts in the different views.

1 indicates a framework in which the parts are properly mounted.

2 denotes two wire-feed rolls of any suitable construction, and 3 wire-straightening mechanism of a well-known character.

4 denotes the means for forming the wire supplied into rings, comprising in the present instance three rolls 5, horizontally disposed adjacent to the feed-rolls.

6 is a cutting mechanism.

The wire is fed uninterruptedly, or substantially so, and the wire-feed rolls are adapted to feed a variably-predetermined length of wire in a certain period. To correspond therewith, the means for forming the wire into rings are made adjustable to form one or more rings of variable sizes out of the predetermined length of wire in the same period. The cutting mechanism is also adjustable and is adapted to cut off the wire after the proper length has been fed and to act a number of times in the period it takes to feed a predetermined length of wire equal to the number of rings formed. The driving mechanism for effecting these several movements may of course be widely varied. In its preferred form the construction is as follows:

7 denotes a power-shaft having the pulleys 8 and 9 and provided with the pinion 10, meshing with the gear 11.

12 is a sector mounted in the framework for driving the feed-rolls. This sector is operated from the gear 11, which latter serves as a crank by means of the rod 13, fastened to one end to the said sector and adjustably secured with its other end on the crank or gear 11 by means of the adjustable screw 12'. By this means the stroke of the gear-sector is varied.

14 is a shaft mounted in the framework carrying the lower feed-roll 2 and provided with the gear 15, engaging with the gear 16 of the other feed-roll 2. This shaft is operated uninterruptedly from the gear-sector by means of a clutch mechanism, so that the sector will operate the said shaft 14 in the same direction on both the upward and downward stroke of the said sector.

17 and 18 denote two pinions mounted loosely on the shaft 14, the sector engaging the pinion 17 direct and operating the pinion

18 through the instrumentality of the pinion 19 and gear 20, carried by the shaft 21, the said sector engaging the pinion 19 and the gear 20 engaging the pinion 18.

5 22 and 23 are two clutches of the same construction, but with the elements reversed. Only one of these will be described. The pinion 18 is keyed to the cup-shaped collar 24, mounted loosely on the shaft 14, having a
10 hardened inside surface 25.

26 is a cam-ring mounted inside the collar 24 and attached to the sleeve 27, fast on the shaft 14. This cam-ring is provided with a number of cam-surfaces terminating at one
15 end in a recess 28 and at the other end in an incline 29. Mounted loosely on the sleeve 27 is an outer member 30, having projections 31 extending into the space formed between the cup-shaped collar 24 and the cam-ring 26.
20 In this said space resting on the cam-ring and between the projections 31 of the outer member are a plurality of rollers 32. A spring 33 is connected at one end of the outer member 30 and at its other end to the sleeve 27.
25 On the downstroke the sector will drive the pinion 18 in the direction shown, carrying the cup-shaped collar 24 with it. This has the effect of moving the rollers 32 up to the incline 29, thereby jamming the parts, and consequently carrying the sleeve 27 with it, where-
30 by the shaft 14 is rotated. When the sector moves upward, the spring 33 will pull the outer member 30 with it, so that the projections 31 will carry the rollers 32 into the recesses 28, while the action of the sector will
35 cause the cup-shaped collar 24 to travel in the opposite direction of the shaft 14, the said cup-shaped collar escaping past the rollers 32, owing to the fact that they are in the recesses
40 28. At the same time the sector is operating the members of the other clutch to drive the shaft 14 in the same direction as previously, so that the said shaft is operated continuously or uninterruptedly in one direction. By regulat-
45 ing the stroke of the sector the amount of the wire fed in a certain period or with each stroke of the sector can of course be variably predetermined.

The three ring-forming rolls 5 are mounted
50 on the bracket 34 and are adjustably secured to the same in the slots 35 by means of the set-screws 36, so that different sizes of rings can be formed.

The cutting mechanism 6 in the present instance comprises a cutting-knife 37, mounted
55 on a vertical stem 38, working in the guide 39, pivoted in the ears 40 of the support 41, which latter is adjustably mounted in the sleeve 42, secured to the position by means of the screw 43. The shaft 44 of the gear 11
60 carries a cam member 45, comprising a collar 46, having a sidewise-projecting lug 47 and a cam-support 48, mounted adjacent to the same and provided with the set-screws 49, adapted

to be tightened against the lug 47, and where- 65
by also the said cam-support can be adjusted circumferentially on the shaft 44. The cam-support carries a number of removable cams 50, in the present instance two. These cams
act on the rod 51 in the support 41, having a 70
head 52, which prevents downward displacement and which engages with the stem 38 to operate the cutting-knife. The guide 39 has a passage 53, through which the wire passes
75 from the ring-forming rolls, and further carries an extension 54, resting on the boss 55 of the support 41 and pressed thereagainst by the spring 56. By this means the cutting operation will not interfere with the uninterrupted feeding of the wire, as the guide 39 will
80 follow the feeding motion of the wire while it is being cut by reason of its pivotal connection with the support 41 and will return to its proper position by means of the spring 56. This play of the cutting mechanism is indicated in dotted lines in Figs. 7 and 8. The
85 spring 57 returns the stem 38 to its downward position after it has been lifted by the rod 51.

From the foregoing it will be understood that the wire is fed uninterruptedly, but that 90
a variably-predetermined length can be fed with each complete up-and-down stroke of the sector. The driving mechanism for the feed-rolls and for the cutting mechanism are so related that with each complete stroke of the 95
sector the cutting mechanism acts a number of times equal to the number of rings desired. By removing one of the cams 50 it will act only once in each period and by retaining both it will act semiperiodically. By adjusting the 100
wire-forming rolls 5 to form into a ring a length of wire equal to the length of wire cut off different sizes of rings can of course be obtained, or several rings of an equal size can be formed in each period. The support 41 105
must of course also be adjusted in the sleeve 42 to correspond to the adjustment of the rolls 5, and when only one ring is formed in each period the circumferential position of the cam-support will be suitably adjusted to 110
cause the cutting device to operate at the proper time, depending upon the size of the ring desired. With this arrangement no matter how the machine is adjusted no time will be lost by the moving parts; but the machine 115
will turn out rings uninterruptedly.

A plate 58, having an inclined portion 59, is located adjacent to the ring forming and cutting mechanisms to cause the forward end
120 of the wire ring to travel up above the wire-forming rolls.

The operation of the machine is as follows: The wire passes through the wire-straightening mechanism, through the feed-rolls to the ring-forming rolls, and into the passage 53 to 125
the wire-cutting mechanism, where it is cut off at the proper moment, after which it is disposed of in some suitable way.

Having thus described my invention, what I claim is—

1. In a machine of the character set forth, the combination with wire-feed rolls, adjustable ring-forming rolls, and an adjustable wire-cutting mechanism, of an adjustable driving mechanism for operating the feed-rolls uninterruptedly to feed a variably-predetermined length of wire in a certain period, and for operating the cutting mechanism after the proper length of wire has been fed and a number of times in the said period equal to the number of rings formed.

2. In a machine of the character set forth, the combination with wire-feed rolls, ring-forming rolls and a wire-cutting mechanism, of driving mechanism comprising in part: a clutch mechanism for operating the feed-rolls uninterruptedly, a sector imparting motion to the clutch mechanism, a cam member for operating the cutting mechanism, acting at periods corresponding to the stroke of the sector.

3. In a machine of the character set forth, the combination with wire-feed rolls, adjustable ring-forming rolls and an adjustable wire-cutting mechanism, of driving mechanism comprising in part: a clutch mechanism for operating the feed-rolls uninterruptedly, a sector having an adjustable stroke imparting motion to the clutch mechanism, a cam member for operating the cutting mechanism acting one or more times to each stroke of the sector.

4. In a machine of the character set forth, the combination of a shaft for operating the feed-rolls, two clutches mounted on the same acting in opposite directions to drive the shaft uninterruptedly in one direction, two pinions mounted loosely on said shaft for operating the clutches, and a sector adapted to operate said pinions in opposite directions.

5. In a machine of the character set forth, the combination of a shaft for operating the feed-rolls, two clutches mounted on the same acting in opposite directions to drive the shaft uninterruptedly in one direction, two pinions mounted loosely on said shaft for operating the clutches, a gear engaged with one of the pinions on the feed-roll-operating shaft, a shaft carrying the same, a pinion mounted on the same shaft, and a sector engaging with the other pinion on the feed-roll-operating shaft and with the pinion on the shaft carrying the gear.

6. In a machine of the character set forth, the combination of a shaft for operating the feed-rolls, two clutches mounted on the same acting in opposite directions to drive the shaft uninterruptedly in one direction, two pinions mounted loosely on said shaft for operating the clutches, and a sector having an adjustable stroke and adapted to operate said pinions in opposite directions.

7. In a machine of the character set forth, the combination of a shaft for operating the feed-rolls, two clutches mounted on the same acting in opposite directions to drive the shaft uninterruptedly in one direction, two pinions mounted loosely on said shaft for operating the clutches, a gear engaging with one of the pinions on the feed-roll-operating shaft, a shaft carrying the same, a pinion mounted on the same shaft, and a sector having an adjustable stroke and engaging with the other pinion on the feed-roll-operating shaft and with the pinion on the shaft carrying the gear.

Signed at New York this 6th day of April, 1903.

OTTO S. BEYER.

Witnesses:

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