

No. 810,794.

PATENTED JAN. 23, 1906.

J. McNAMEE:
KNITTING MACHINE.
APPLICATION FILED JULY 24, 1905.

4 SHEETS—SHEET 1.

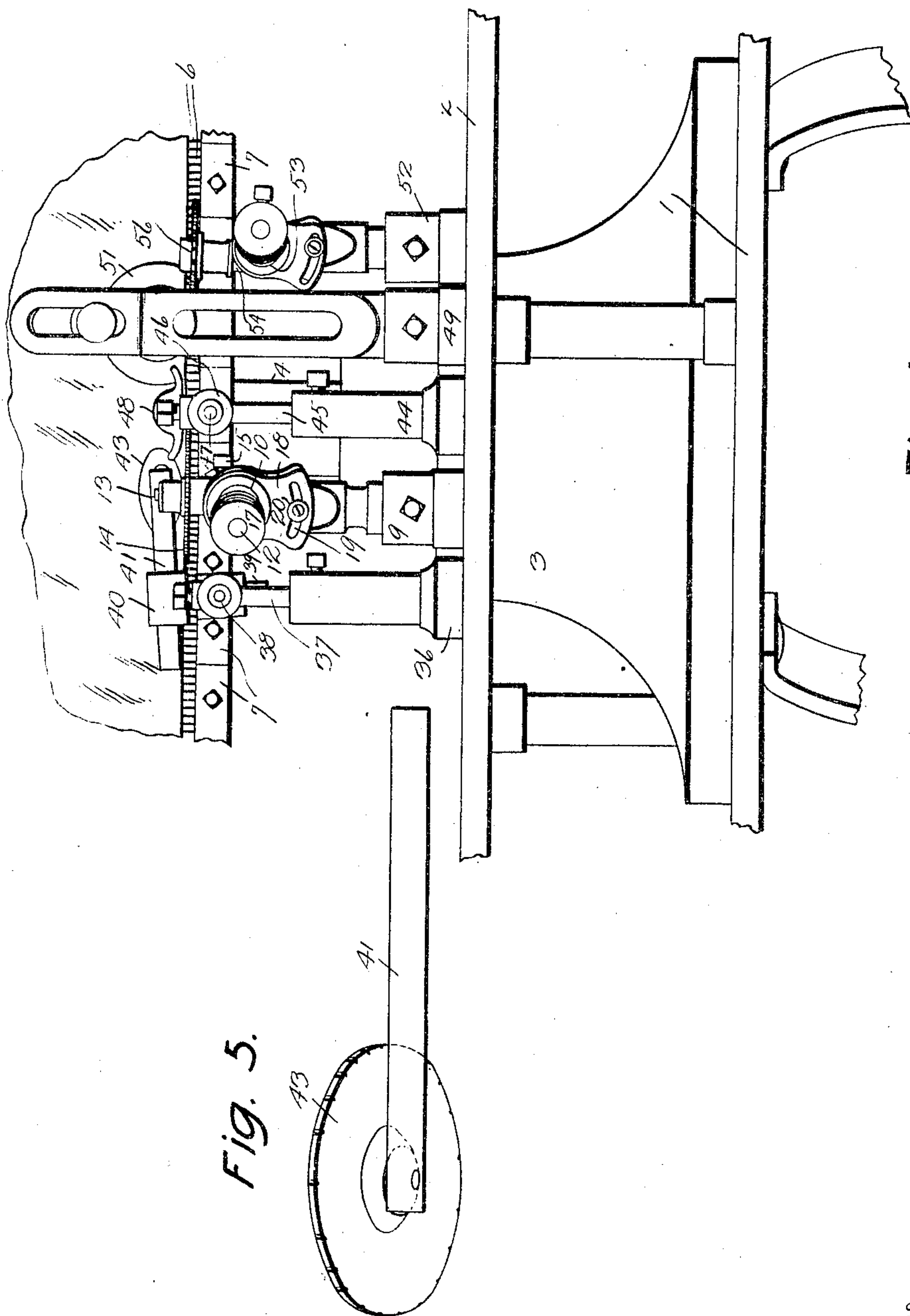


Fig. 1.

Fig. 5.

Witnesses
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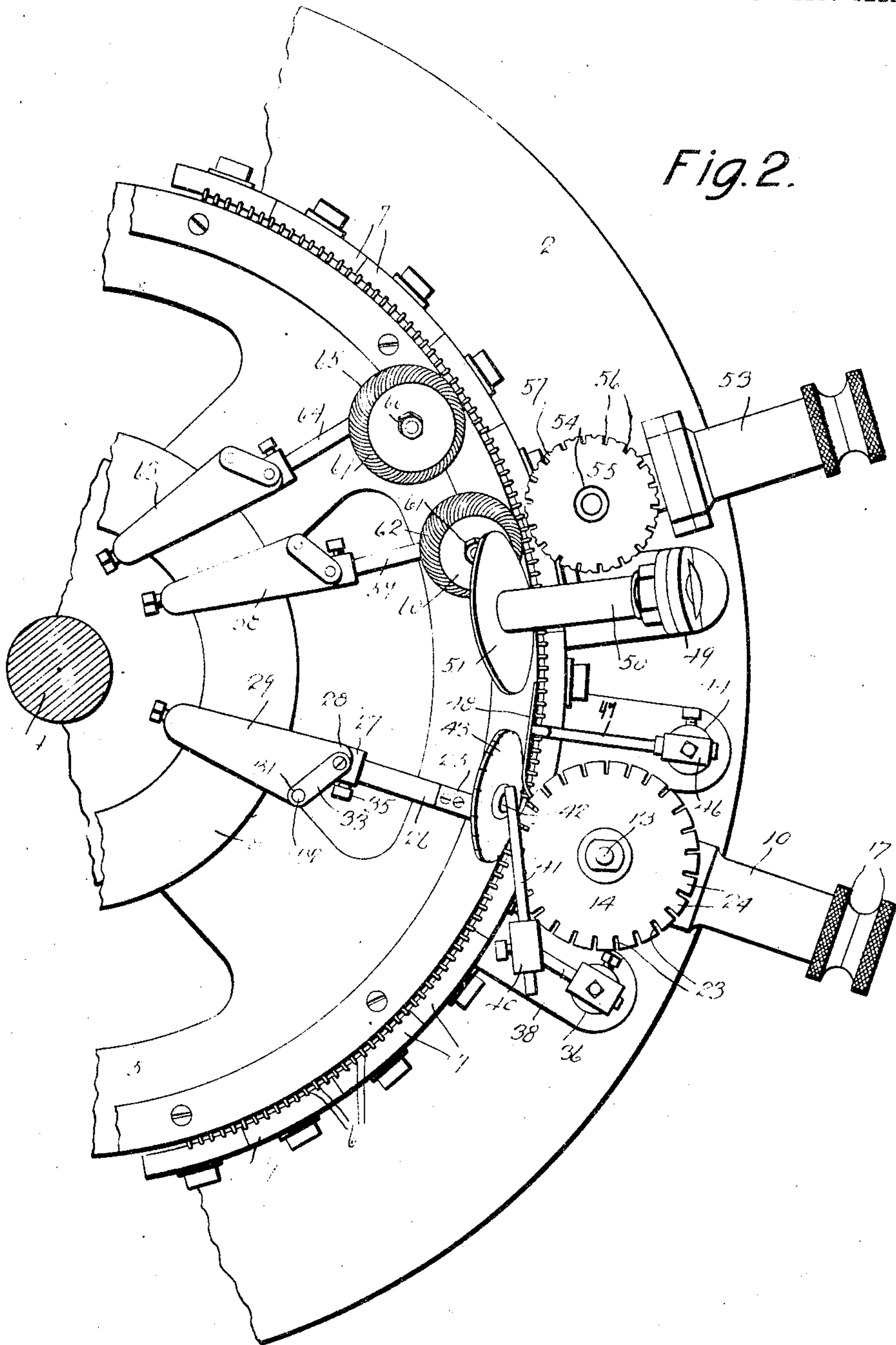
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4 SHEETS—SHEET 2

Fig. 2.



Witnesses

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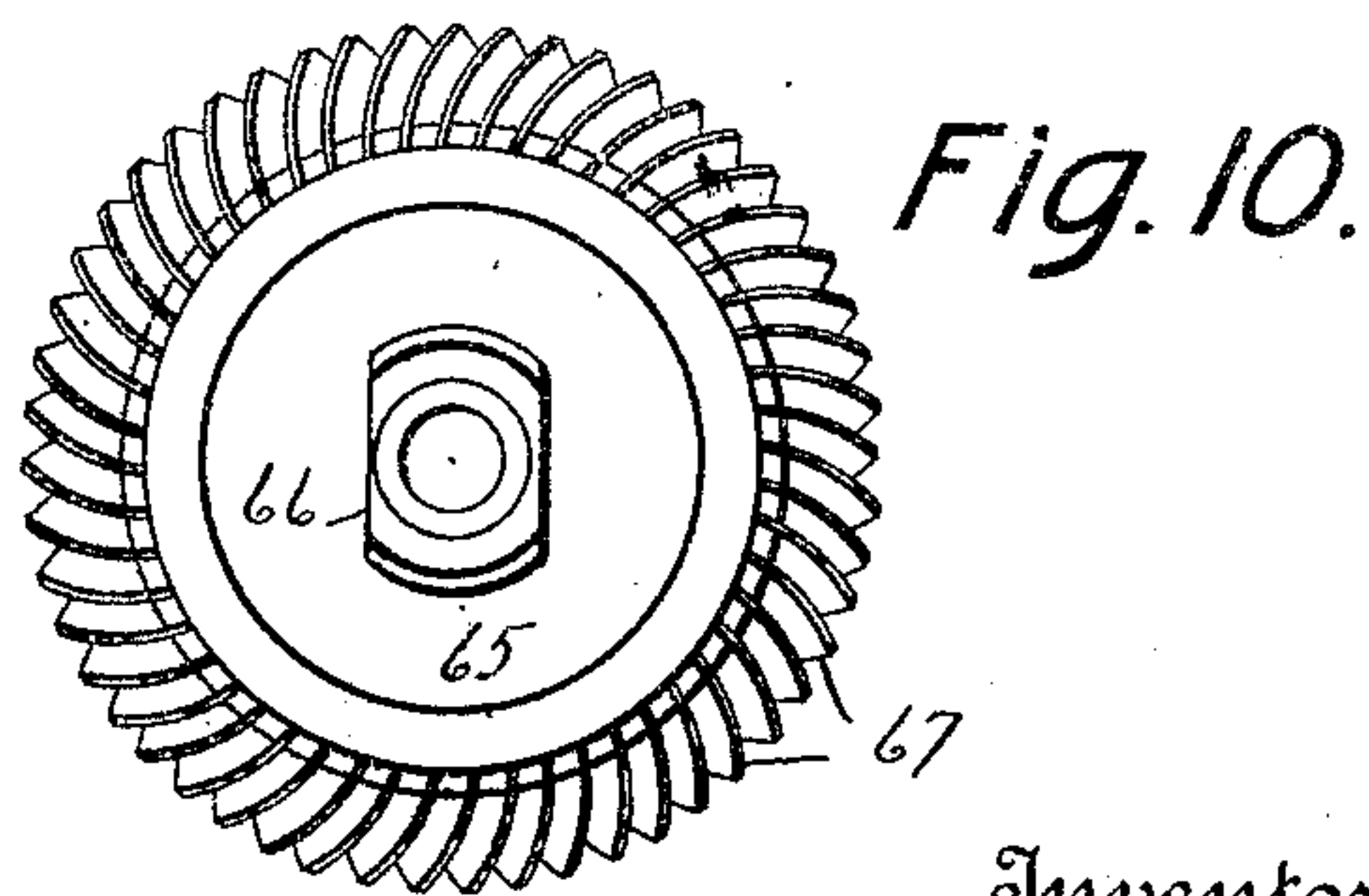
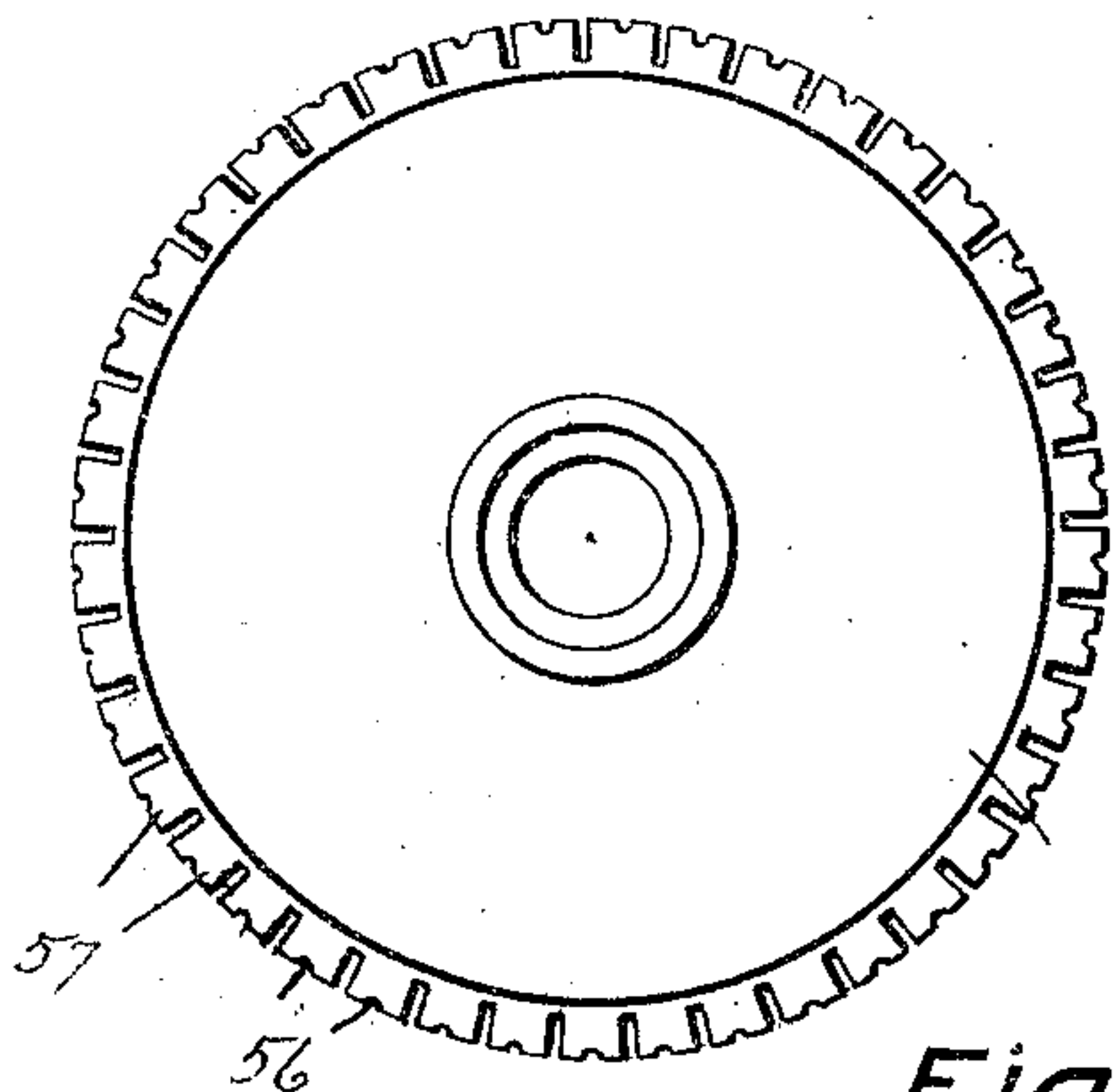
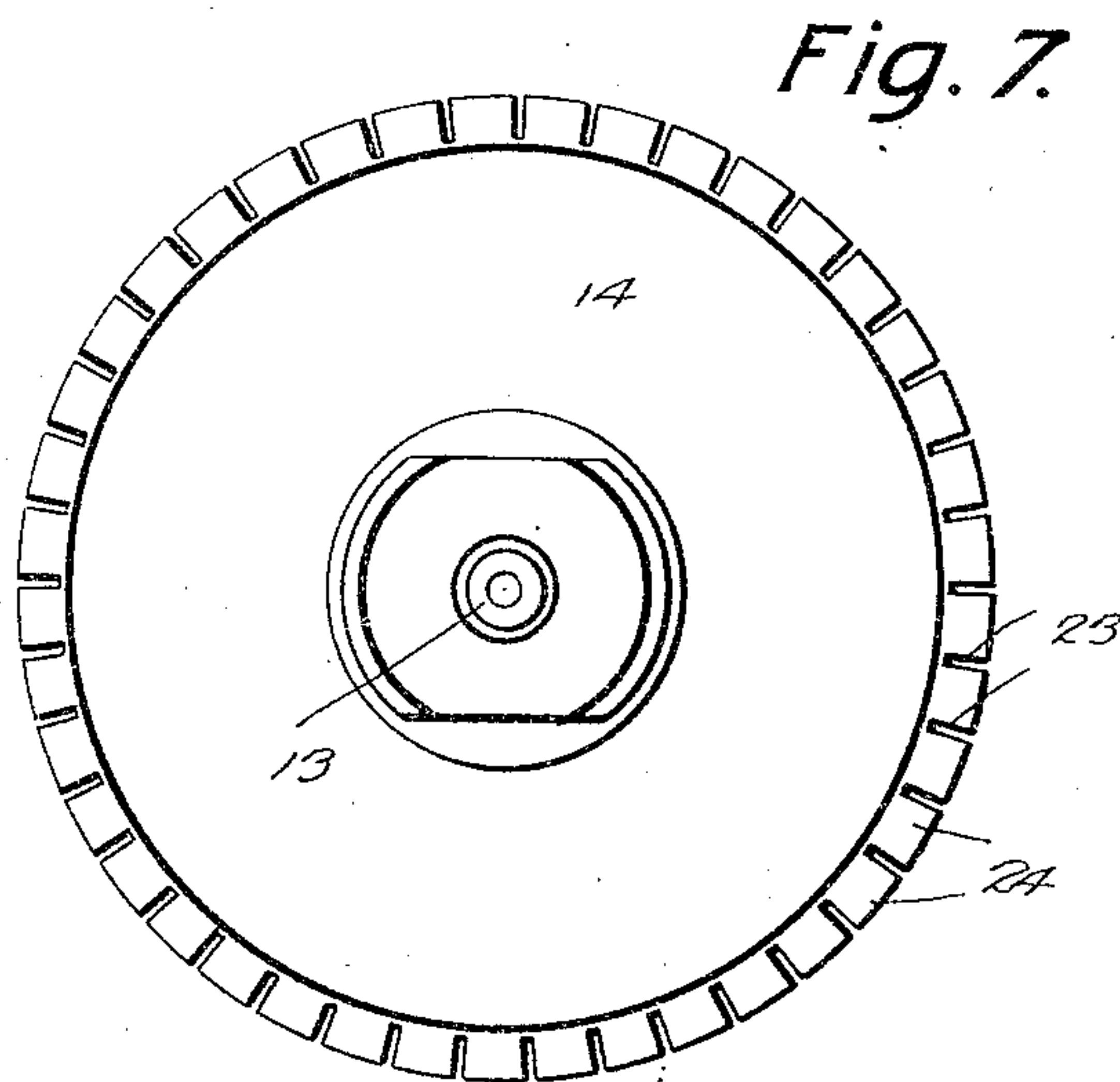
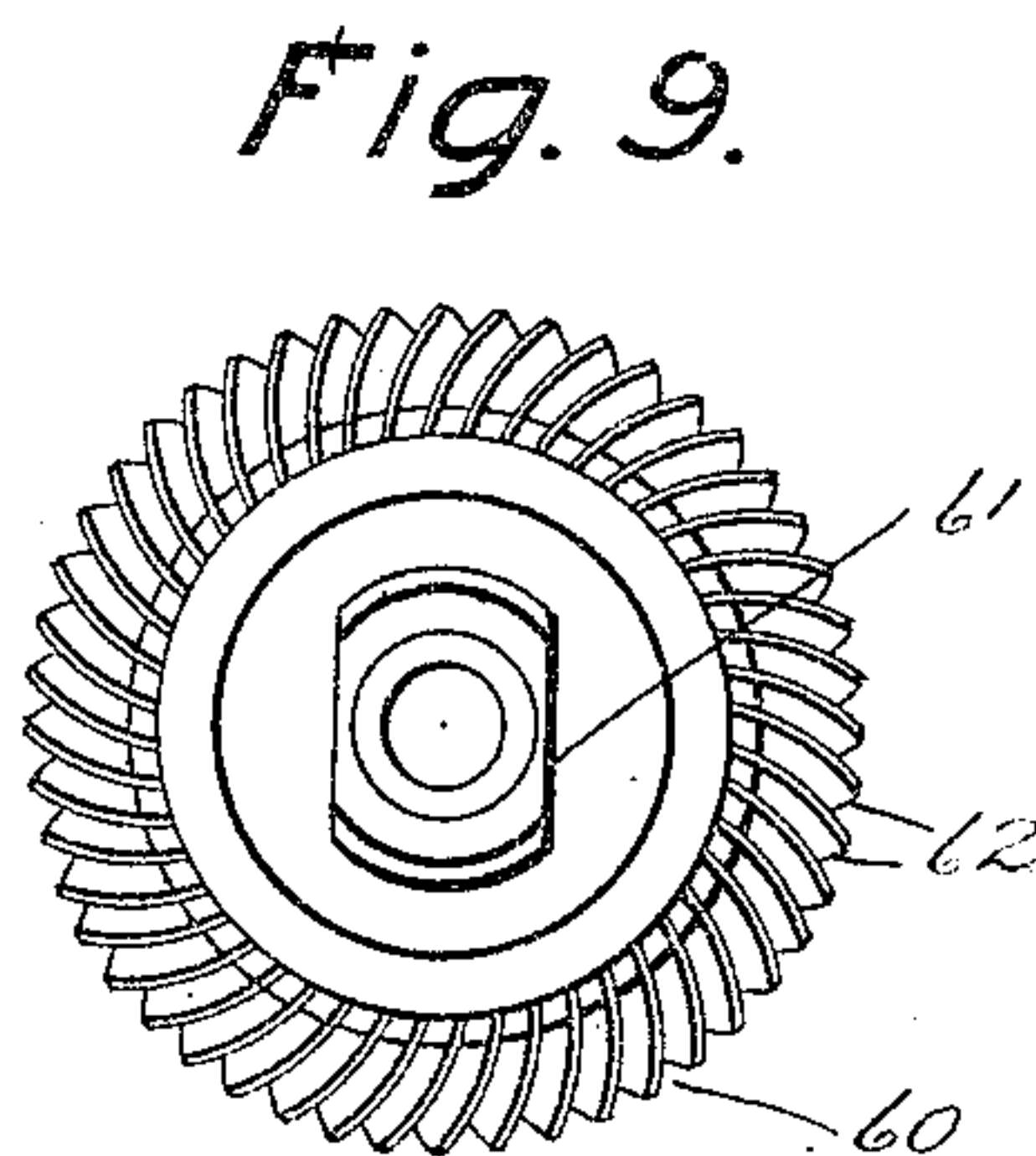
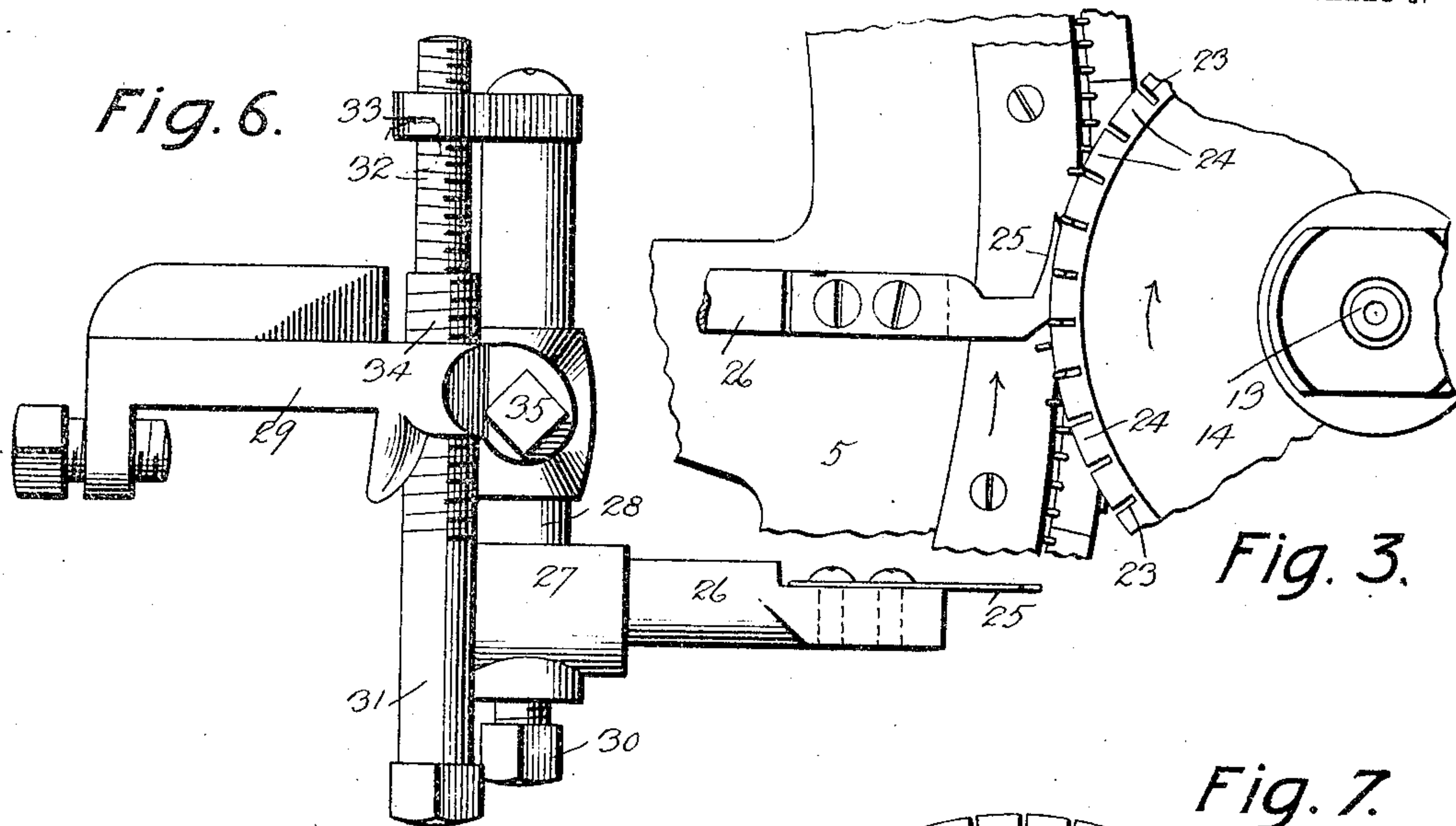
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4 SHEETS—SHEET 3.



Witnesses

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C. H. Giesbauer.

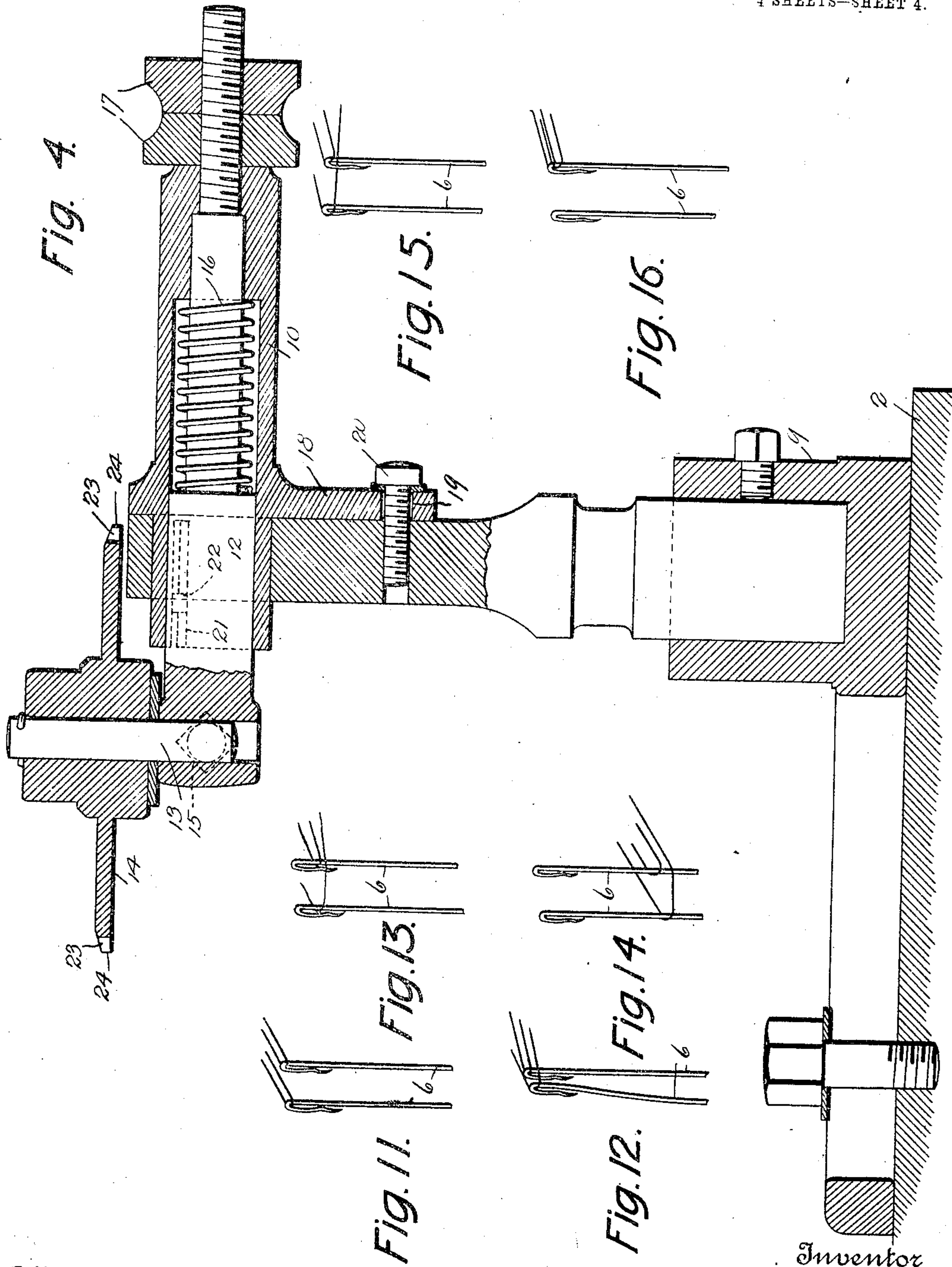
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4 SHEETS—SHEET 4.



Witnesses

Geo. Hilton
C. H. Griesbauer.

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UNITED STATES PATENT OFFICE.

JAMES McNAMEE, OF PHILMONT, NEW YORK.

KNITTING-MACHINE.

No. 810,794.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed July 24, 1905. Serial No. 270,978.

To all whom it may concern:

Be it known that I, JAMES McNAMEE, a citizen of the United States, residing at Philmont, in the county of Columbia and State of New York, have invented certain new and useful Improvements in Knitting-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-
10 pertains to make and use the same.

This invention relates to attachments for knitting-machines.

The object of the invention is to provide an attachment for producing locked-stitch open-
15 work in cloth while the same is in the process of being knitted.

Another object is to provide an attachment of this character which will operate upon the needles of the machine independently from the
20 knitting mechanism and while the latter is in operation.

With the above and other objects in view the invention consists of certain novel features of construction, combination, and arrangement
25 of parts, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of an attachment and so much of a spring-needle circular-knitting machine as is necessary to show the application of the
30 invention. Fig. 2 is a plan view of the same. Fig. 3 is a detail fragmentary plan view, on an enlarged scale, showing the relation of the "alining-wheel" and the stationary cam and
35 the manner in which the needles are acted on by these parts. Fig. 4 is a detail sectional view through the standard of the alining-wheel, showing the manner in which the same and the cut presser-wheel are mounted. Fig.
40 5 is a detail perspective view of the push-down wheel and its supporting-arm. Fig. 6 is a side view of the stationary cam-plate and its supporting-bracket. Fig. 7 is a detail plan view of the alining-wheel. Fig. 8 is a similar
45 view of the cut presser-wheel. Figs. 9 and 10 are respectively detail plan views of the landing and cast-off wheels. Fig. 11 is a detail perspective view of two needles, showing the position of the thread-loops thereon before
50 said needles enter the notches of the alining-wheels. Fig. 12 is a similar view showing the position of the needles and loops after entering the notches of the alining-wheels. Fig. 13 is a similar view of the needles and loops after leaving the alining-wheels. Fig. 14 is
55 a similar view showing the position of the

thread-loops after the same have been pushed down on the needles by the cloth-wheel. Fig. 15 is a similar view showing the position of the thread-loops after the beard on one of the
60 needles has been acted on by the cut presser-wheel and after the landing-wheel has raised both the loops above the points of the needle-beards; and Fig. 16 is a similar view showing
65 the position of the thread-loops after they have been acted on by the cast-off wheel which raises both the loops above the tops of the needles, the loop on the needle with the closed
beard being raised on the outside of the beard, and consequently being cast off, leaving said
70 needle bare and both loops on the other needle.

Referring more particularly to the drawings, 1 denotes the bed or table of the machine, above which and secured thereto is a stationary supporting ring or plate 2, upon
75 which are adjustably secured the standards for supporting the various devices which operate upon the threads to form the cloth. Secured to the table 1 is an upwardly-projecting bearing-standard 3, in which and the table 1 is
80 journaled a vertically-disposed shaft 4, on which is mounted a needle cylinder or ring 5, on the periphery of which is arranged an annular series of needles 6, said needles being
85 the usual spring-beard needles and secured to the cylinder by means of clamping-plates 7, as shown. Above the needle-cylinder is arranged an inside supporting stationary
plate 8. The foregoing parts may be of the
90 ordinary or any suitable construction.

Adjustably mounted upon the stationary ring or plate 2 of the table is an upright bracket or standard 9, on the upper end of which is arranged a horizontally-disposed
95 bearing-sleeve 10. In this sleeve 10 is slidably mounted a supporting rod or bar 12, on the inner end of which is formed an upwardly-projecting stud-shaft 13, on which is journaled a horizontally-disposed alining-wheel 14. The stud-shaft 13 is removably se-
100 cured in the outer end of the bar 12 by means of a set-screw 15. Around the bar 12 within the sleeve 10 is arranged a coil-spring 16, one end of which bears against a shoulder formed on the arm 12 and the opposite end bears
105 against the outer end wall of the sleeve 10, the tension of the spring being exerted to force the bar 12 and the alining-wheel 14 carried thereby inwardly toward the needle-cylinder. The outer end of the bar 12 is adapted to project
110 through an aperture formed in the outer end of the sleeve 10, said projecting end being

threaded to receive adjusting-nuts 17, whereby the inward movement of the bar 12 by the spring 16 is limited and by which said movement of the bar may be increased or diminished, as desired. The sleeve 10 is provided with an integrally-formed downwardly-projecting segmental lug or plate 18, in which is formed a segmental slot 19, through which and into the standard 9 is adapted to be screwed a set-screw 20. In the inner end of the sleeve 10 is formed a longitudinally-disposed slot 21, which is adapted to be engaged by a lug or stud 22, formed on the bar 12. By means of the segmental slot 19 in the lug 18 the sleeve 10 may be turned in the standard 9, and owing to the slot-and-stud connection between the sleeve and the bar 12 said bar and the alining-wheel 14, journaled thereon, will also be turned, thus permitting the alining-wheel to be adjusted at various angles and to be rigidly held at such angles by the set-screw 20.

The alining-wheel 14 is provided around its periphery with a series of notches 23, which form teeth 24, said notches and teeth being adapted to engage and act upon the needles in the needle-cylinder in the following manner: Each of the notches 23 is of sufficient width to admit a needle and is deep enough to receive two needles, so that the second needle will be practically flush with the ends of the alining-teeth, the depth and width of the slots being regulated by the needles used.

For the purpose of illustrating the relative differences between the width of the notches 23 and the teeth 24 it may be sufficient to say that while the slot is wide enough to admit one needle one tooth is about the width of one needle plus twice the space between two needles, allowance being made for the action of the needles upon the alining-wheel by forcing it slightly ahead when in operation.

Adapted to coact with the alining-wheel 14 is a cam-plate 25, said plate being secured to the outer end of an arm or bar 26, which is adjustably secured at its opposite end within a sleeve 27, formed on the lower end of a vertically-disposed bar 28, which is in turn adjustably supported in the outer end of a bracket 29, removably secured to the inner stationary plate 8 of the machine. The arm 26 is adjustably secured in the sleeve 27 by means of a set-screw 30, while the bar 28 is adapted to be adjusted in the bracket 29 by means of a vertically-disposed adjusting-screw 31, the upper portion of which is provided with right-handed screw-threads 32. Said upper threaded portion is adapted to engage and work through a short arm 33, secured to and projecting at right angles from the upper end of the bar 28. Below the right-angularly-threaded portion of the adjusting-screw is formed a series of left-handed threads 34, adapted to work in a similarly-threaded aperture formed in the bracket 29, whereby when

the adjusting-screw is turned in one direction or the other the bar 28 will be moved up or down in the bracket 29, as will be understood. The bar 28 is locked in its adjusted position by means of a set-screw 35, arranged in the end of the bracket 29, as shown. The outer edge of the cam-plate forms a mixtilineal angle and operates upon the inner side of the needles. The curved portion of the cam-face is adapted to correspond with the curvature of the alining-wheel and is sufficient in longitudinal extent to come into contact with several needles, the cam being so adjusted with reference to the needles that the latter when sprung inwardly by the teeth on the alining-wheel will strike against the straight portion of the cam-face. The straight portion of the cam-face recedes from the line of curvature of the curved portion at such an angle and to such an extent as to catch such needles as are forced inwardly by the teeth of the alining-wheel and to force said needles from the ends of the alining-wheel teeth and into the notches between said teeth.

On the ring 2 adjacent to the standard 9 is adjustably secured a standard 36, in the upper end of which is adjustably mounted a vertically-disposed supporting-rod 37. In the upper end of this rod 37 is adjustably mounted a horizontally-disposed arm 38, on the outer end of which is adjustably mounted a vertically-disposed rod or bar 39. In the upper end of the bar 39 is formed a right-angularly-disposed sleeve 40, in which is adjustably mounted a supporting-arm 41, on the end of which is a right-angularly-disposed bearing-stud 42. On this stud 42 is journaled a push-down wheel 43, similar in construction to the ordinary cloth-wheel and which may be formed in any convenient size. On the stationary ring 2 is adjustably secured a standard 44, on the upper end of which is adjustably mounted a vertically-disposed supporting rod or bar 45, on the upper end of which is formed a horizontally-disposed sleeve 46. In this sleeve 46 is adjustably mounted a horizontally-disposed inwardly-projecting supporting-arm 47, the inner end of which is bent upwardly longitudinally to form a right-angularly-disposed support, on the end of which is secured a push-down shoe 48, said shoe being preferably formed of a segmental-shaped plate, as shown.

On the ring 2 adjacent to the standard 44 is adjustably secured a standard 49, in the upper end of which is formed a vertically-disposed slot, in which is adjustably mounted an inclined bearing-shaft 50. On this shaft 50 is journaled a cloth-wheel 51, said wheel being of the usual construction and operated in the usual manner. Adjacent to the standard 49 on the ring 2 is adjustably secured a supporting-standard 52, in the upper end of which is arranged a horizontally-disposed supporting-bar 53, adjustably and yieldably

mounted in the standard 52 in the same manner as described in connection with the supporting mechanism of the alining-wheel 14. In the inner end of the bar 53 is adjustably secured a vertically-disposed stud-shaft 54, on which is journaled a horizontally-disposed cut presser-wheel 55. In the periphery of the wheel 55 is formed a series of notches 56, which form teeth 57, said teeth being arranged to engage and press shut the beard of each alternate needle, thus releasing the thread-loop on such needle in the ordinary manner.

Removably secured to the inside plate 8 is a supporting-bracket 58, in which is adjustably secured an outwardly-projecting bar 59, on the outer end of which is journaled a landing-wheel 60, said wheel being of the usual construction and consisting of a central hub portion 61, in the periphery of which is secured an annular series of obliquely-disposed teeth or blades 62, adapted to be engaged with the needles to raise the thread-loops thereon above the points of the beards of said needles. On the inside plate 8 adjacent to the bracket 58 is removably secured a similar bracket 63, in which is adjustably secured a supporting-bar 64. On the outer end of the bar 64 is journaled a cast-off wheel 65, of the usual or any suitable construction, but is here shown as consisting of a central hub portion 66, around the edge of which is secured an annular series of obliquely-disposed blades or teeth 67, adapted to engage the needles and to lift the thread-loops thereon above the same, thereby disengaging the thread-loop on the closed-beard needle, leaving said needle bare, said thread-loop being thereby engaged with the next adjacent needle.

The operation of the device is as follows: The periphery of the alining-wheel is set outside of the cylinder and just below the tops of the needles and is so adjusted that each alternate needle will naturally ride into a notch of said wheel, and each intermediate needle will be sprung inwardly by the teeth of the wheel. By setting the alining-wheel just below the tops of the needles the loops held by the needles are not interfered with by the alining-wheel. The cam-plate 25 is arranged inside of the needle-cylinder and on a plane slightly lower than the alining-wheel, and so adjusted that the curved portion of the cam-face is flush with the ends of the alining-teeth. When the cylinder starts to rotate, one needle rides naturally into a notch of the alining-wheel, and the needle next ahead (in the direction in which the needle-cylinder is turning) comes upon the end of an alining-tooth and is sprung inwardly and carried by said tooth until it strikes the straight portion of the edge of the cam-plate. This straight portion forces the needle off the alining-tooth and into the notch with the needle next behind it. Two needles are now in one notch, the notches being, as hereinbefore described,

wide enough to admit one needle without binding and deep enough to admit two needles, one after the other, thus affording a firm lateral support to the needles while in the notch. As hereinbefore stated, the curved portion of the edge of the cam-plate corresponds with the curvature of the alining-wheel, and the needles which have been forced from the ends of the alining-teeth and into the notches ride against this curved portion of the cam edge, and both needles are thus firmly held in the notches. Thus each successive notch and the curved portion of the cam edge form, as it were, a jacket in which is held each pair of needles while the same are passing the cam-plate. At this point begins the operation of transferring the loop or stitch from one needle to the needle next ahead. This operation is started by the push-down wheel, which is located inside the perpendicular line of the needles against and outside of the cloth, said wheel being adjusted so that its periphery extends slightly below the tops of the needles and is also adjusted with reference to the needles in the notches so that when two needles are firmly held together in a notch by the pressure of the cam-plate the loops or stitches on both needles are carried inwardly toward the center of the cylinder and downwardly to a point below the tops of the needles. Thus the loop on the needle farthest in the notch by the action of the push-down wheel upon the cloth just above the needles is brought down over the two needles and the loop on the outer needle in the notch is brought down only on said needle which before held it. The thread loops or stitches while in the position just described are engaged by the push-down shoe 48, which is located in a position similar to that of the push-down wheel, said loops being carried by said shoe below the tops of the needles until said needles thus operated upon reach the cloth-wheel 51, which engages said thread-loops immediately after they are disengaged from the push-down shoe and pushes or carries said loops down below the points of the needle-beards and adjacent to the bottom of the needles in the usual manner. Adjacent to the cloth-wheel is arranged the cut presser-wheel 55, the object of which is to "press off" or to close or press shut the beard of each alternate or second needle for the purpose of allowing the thread-loops on those needles to be brought up and over the outside of the beards thereon, the arrangement of the presser-wheel being such that the beards of the intermediate needles are not engaged thereby. The cut presser-wheel 55 is arranged in such relation to the alining-wheel 14 that it will press off or close the beard of the needle which entered the notch of the alining-wheel first and which has only one thread-loop upon it and will not press off or close the beard of the needle which has on it the two thread-loops—to wit, its own loop and the loop which it now shares with the

next needle. Directly under the cut presser-wheel and inside the needle-cylinder is located the landing-wheel 60, which operates conjointly with the cut presser-wheel in the usual manner. The landing-wheel is adjusted in the usual position and is adapted to engage the needles and to raise all the loops thereon to a position on the needles above the points of the beards. Thus on those needles having two thread-loops upon them the loops are raised inside of the beards, these beards not having been closed by the presser-wheel, and on those needles having but one loop and on which the beard has been closed by the cut presser-wheel the loops will be raised outside the beards and above points of the same. Behind the landing-wheel and in its usual position is arranged the cast-off wheel, said wheel being adapted to engage the needles and to raise all of the thread-loops thereon to the tops of the needles. The loops on the outside of the needle-beards are thus cast off, leaving those needles bare and leaving the two loops in engagement with those needles which were not operated upon by the cut presser-wheel.

By the use of mechanism herein shown and described a loop or stitch is taken off one needle and transferred to the needle next ahead while the knitting-machine is in operation and the cloth is being formed thereon, and while I have herein shown and described said mechanism as being used for transferring every second loop to the needle next ahead it is obvious that by changing the alining-wheel so that to each alining-tooth there will be two, three, four, or more notches and providing a cut presser-wheel to correspond with the alining-wheel in accordance with the first principle it is possible to transfer not only each second loop, but each third, fourth, fifth, &c., and by the manipulation of the alining-wheel and the cut presser-wheel it is possible to form a great variety of figures and patterns.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A machine of the class described having a revolubly-mounted alining-wheel provided with peripheral notches, corresponding in depth with the combined diameters of the number of the needles to be alined, and a stationary cam coacting with the alining-wheel to direct the required number of needles into such notches thereof as said notches successively pass said cam.

2. A machine of the class described having a revolubly-mounted alining-wheel provided with needle-alining notches, a stationary cam coacting with the alining-wheel to direct the required number of needles into such notches thereof as said notches successively pass said cam, and means to adjust said cam.

3. A machine of the class described having a revolubly-mounted alining-wheel provided with appropriately-spaced peripheral notches corresponding in depth with the combined diameters of the needles to be alined, a stationary cam coacting with the alining-wheel to direct the required number of needles into such notches thereof as said notches successively pass said cam, and a push-down shoe to carry the loops on the alined needles below the tops of such needles until the latter reach the cloth-wheel.

4. An attachment for knitting-machines comprising an alining-wheel having radial notches formed therein to successively engage each alternate needle in the machine, and teeth to engage and spring inwardly each intermediate needle, a cam-plate having a straight edge with which is engaged said sprung needle and whereby the latter is forced into the notch of the alining-wheel with the needle naturally entering the same, a curved edge being formed on said cam-plate to coincide with and engage the ends of the teeth of said alining-wheel thereby closing the notch containing the two needles and firmly holding the latter in said notch, means to engage the thread-loop of the latter needle with the sprung needle, means to thus hold the loops on said needles after the same are disengaged from said alining-wheel, means to force the threads down on said needles, means to close the beard of one needle, and means to disengage the thread-loop from the same, substantially as described.

5. In a machine of the class described, the combination of a revolubly-mounted alining-wheel having radial peripheral notches, a stationary cam-plate having a front cam-face converging to the alining-wheel to direct the required number of needles into such notches thereof, and a curved face presented to the periphery of the alining-wheel to retain the needles in such notches during a partial rotation of the alining-wheel.

6. A machine of the class described having a revolubly-mounted alining-wheel having peripheral alining-notches, a stationary cam coacting with the alining-wheel to direct the required number of needles into the notches thereof, as such needles successively pass said cam, and a relatively fixed push-down shoe to carry the loops on the alined needles below the tops of such needles until the latter reach the cloth-wheel.

7. An attachment for knitting-machines comprising a pivoted yieldingly-mounted alining-wheel, having formed therein radially-

disposed notches to engage each alternate
needle and teeth to engage and spring inwardly
each intermediate needle, an adjustably-
mounted cam-plate to force said sprung nee-
5 dles into the notches of the alining-wheel with
the needle that has naturally entered the
same, a pivoted adjustably-mounted push-
down wheel to engage the thread-loop of the
latter needle with the sprung needle, a push-
10 down shoe to hold said thread-loops on said
needles after the latter are disengaged from
said alining-wheel, a pivoted, adjustably-
mounted cloth-wheel to force said loops down
on the needles below the points of the beards,
15 a pivoted, adjustable and yielding-mounted
cut presser-wheel adapted to close the beard
of one of said needles, a pivoted adjustably-

mounted landing-wheel having an annular
series of obliquely-disposed teeth or blades
adapted to engage said needles and raise the 20
thread-loops thereon and a pivoted adjustably-
mounted cast-off wheel adapted to engage said
needles and raise the thread-loops above the
same thereby casting off the loop from the
closed-beard needle, substantially as de- 25
scribed.

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit-
nesses.

JAMES McNAMEE.

Witnesses:

DANIEL F. BREEN,
G. W. HARRIS.