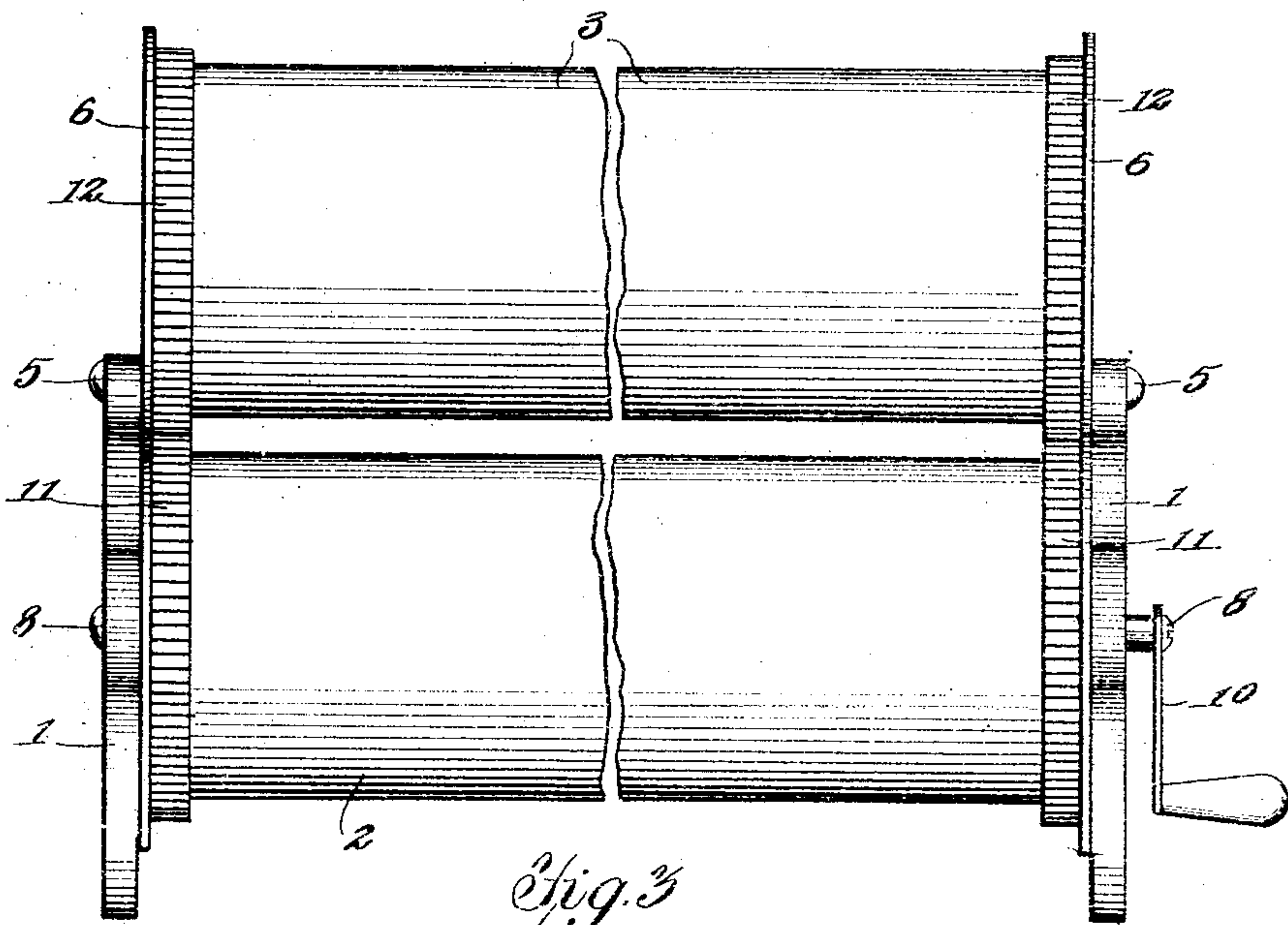
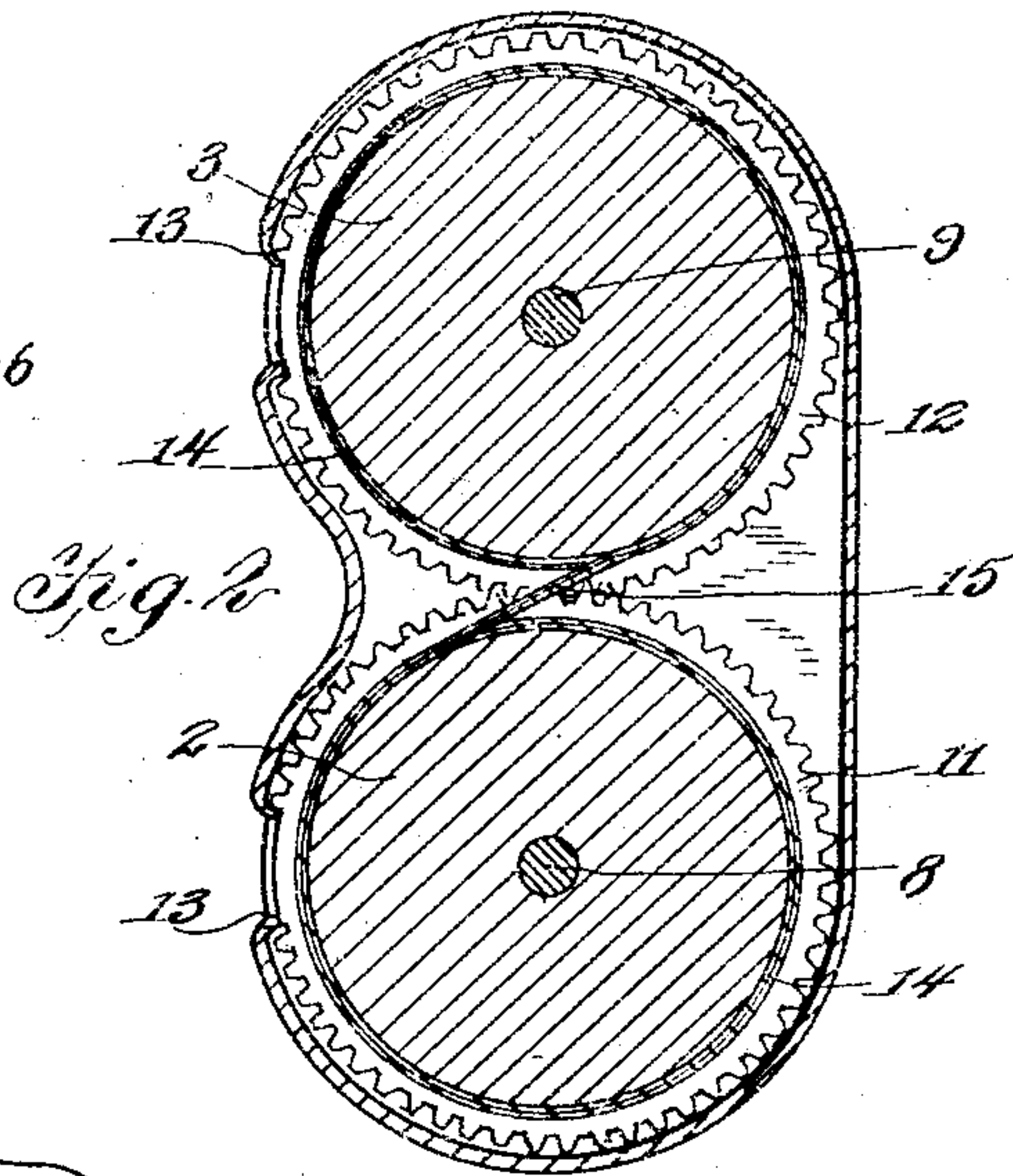
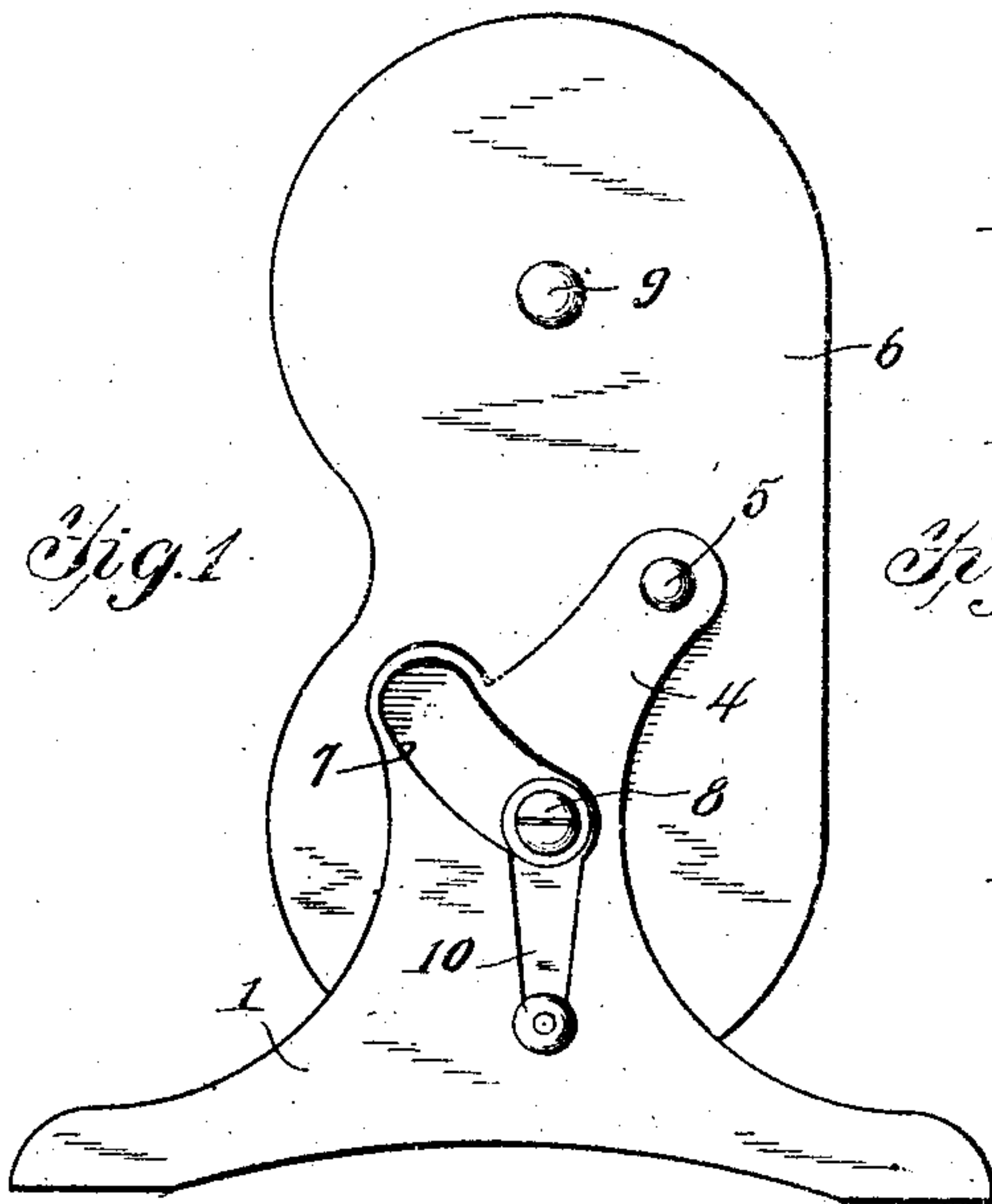


C. D. DUFFIELD.
COMPUTING DEVICE.
APPLICATION FILED MAR. 27, 1913.

1,081,663.

Patented Dec. 16, 1913.

2 SHEETS—SHEET 1.



WITNESSES
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Wm. E. Volk, Jr.

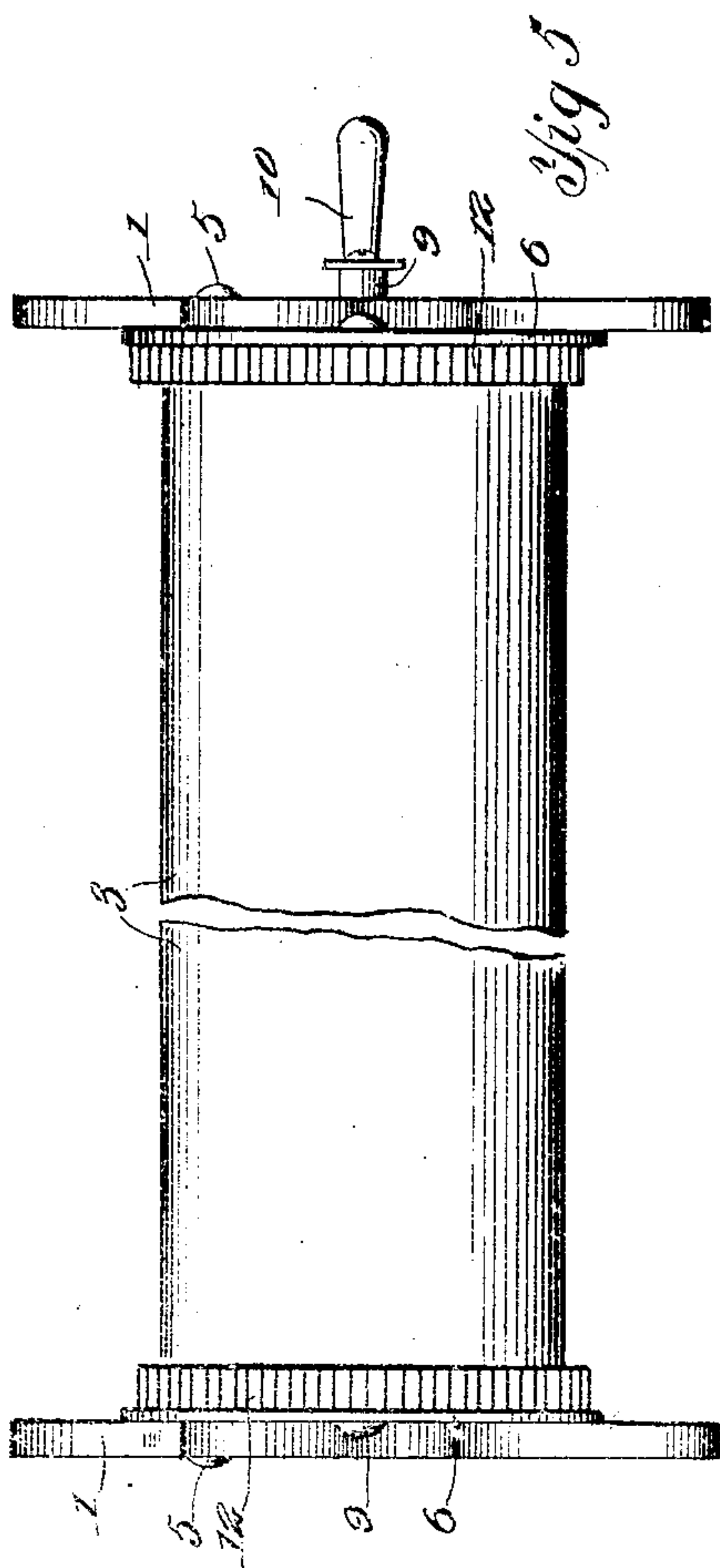
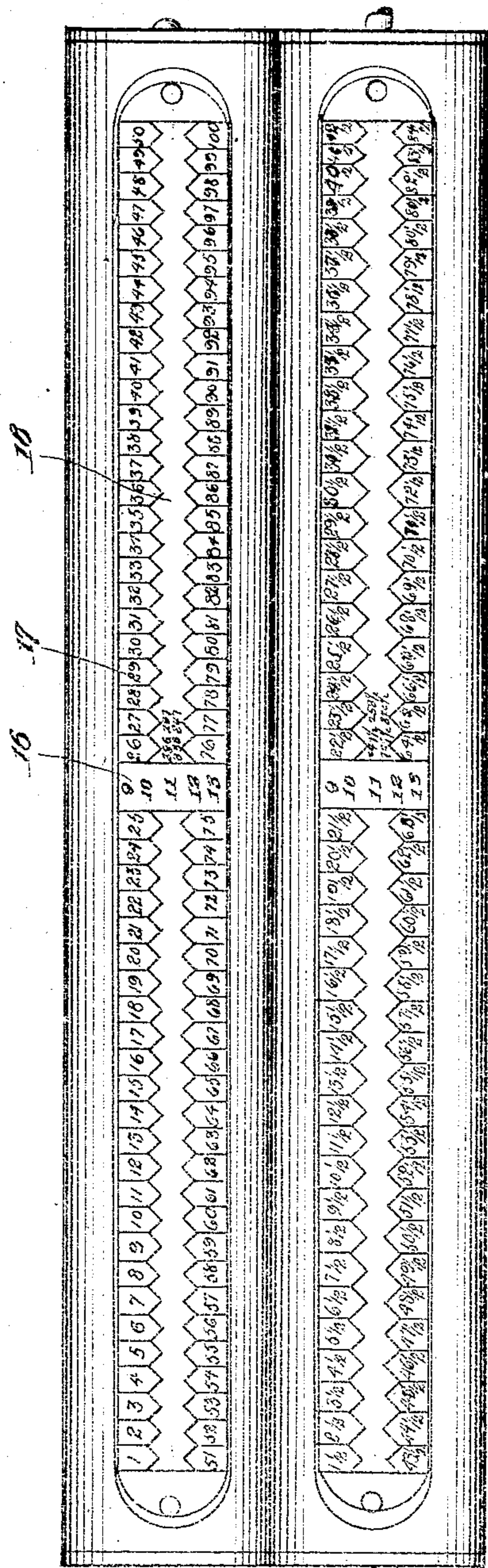
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2 SHEETS—SHEET 2.



WITNESSES:
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A. SCHUTT, OF KENDALLVILLE, INDIANA.

COMPUTING DEVICE.

1,081,663.

Specification of Letters Patent.

Patented Dec. 16, 1913.

Application filed March 27, 1913. Serial No. 757,174.

To all whom it may concern:

Be it known that I, CLOYCE D. DUFFIELD, citizen of the United States, residing at Kendallville, in the county of Noble and State of Indiana, have invented certain new and useful Improvements in Computing Devices, of which the following is a specification.

This invention relates to an improved computing or calculating device for rapidly multiplying given numbers without mathematical calculation, and has for its object to produce a device of this character which will have a very large range in respect to the numbers to be calculated, which will be very compact in structure, and which will be so simple as to render mistakes impossible.

A further object of the invention resides in the provision of a calculating sheet or strip upon which is arranged a plurality of predetermined numbers, the said sheet being operated in connection with a pair of parallel rollers or cylindrical members in such a novel and peculiar manner as to permit use of both sides or faces of the said sheet for calculating purposes.

A still further object of the invention contemplates the provision of a computing device of the above character embodied in convenient form for use and operation in the hand or upon the desk of the user.

The above and additional objects are accomplished by such means as are illustrated in their preferred embodiment in the accompanying drawings, described in the following specification and then more particularly pointed out in the claim which is appended hereto and forms a part of this application.

In describing my invention in detail reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is an end view of a device or machine constructed in accordance with my invention; Fig. 2 is a vertical sectional view, with the supports removed. Fig. 3 is an elevation, with the casing removed; Fig. 4 is an elevation of the rollers with the calculating sheets arranged thereupon; and Fig. 5 is a top plan view of the device with the casing removed.

Before proceeding with the description of the drawings, I desire to call particular attention to the fact that while I have evolved

my invention with reference to the multiplying of various numerals, the same may be readily utilized for adding, subtracting or otherwise calculating numerals.

Referring now to the drawings, wherein is illustrated the preferred form of my invention the numeral 1 designates an upright of novel and peculiar form, there being two, one at each end of the machine, between which a pair of parallel rollers or cylindrical members 2 and 3 are disposed. The upper extremity of the supports 1 have an extension 4 formed integrally therewith, the said extension effecting an eccentric pivot point as at 5 for the outer shell or casing 6 of the machine. An arcuate slot 7 is formed within the supports 1, the curvature of the said slot being described from the eccentric pivot point 5. By the provision of the said slot 7, a tilting of the entire machine, excluding the supports is permitted, the tilted portion of the machine being swung upon the eccentric pivotal connection designated as at 5 in Fig. 1 of the drawings. Two parallel shafts 8 and 9 respectively extend through the rollers 2 and 3 of the machine for fixedly supporting the said rollers and imparting motion thereto through the medium of a crank handle 10 secured at one end of the lower shaft 8. Gear wheels 11 and 12 are formed upon the extremities of the rollers 2 and 3 respectively to impart motion to the roller 3 according to the rotation of the roller 2 created by the manipulation of the crank handle 10. By the provision of the gear wheels 11 and 12 it will be seen that the said rollers are spaced sufficiently apart to permit free rotation of one, without frictional engagement with the other and will cause one of the said rollers to rotate in one direction while the other roller is rotated in the opposite direction for effecting the desired result necessary in carrying out the invention. The outer shell or casing within which the rollers and gear wheels are contained is provided with a pair of transparent depressions 13 extending parallel with and throughout the entire length of the said rollers 2 and 3, the said depressed portions of the casing effecting a sight opening for exposing to view the interior mechanism contained within the said casing.

Having described fully the mechanical structure of the device, the operation and arrangement of the calculating sheet 14 will

now be described. The said sheet 14 is preferably of the same width as the rollers 2 and 3 and is wound thereupon in the following manner: One end of the sheet or tape is
 5 secured to the outer face of the lower roller 2 and is wound thereupon, once, twice or any number of times desired and extends from the said roller as at 15 to the upper
 10 roller 3 upon which it is also wound the desired number of times and secured to the outer face at any suitable point. Arranged at predetermined points upon one face of the sheet 14 so as to be exposed to view
 15 through the sight opening 13 of the upper roller, are a plurality of numbers ranging from 1 to 100, while the opposite face of the said sheet 14 is provided with a plurality of numbers ranging from $1\frac{1}{2}$ to $84\frac{1}{2}$, the said last mentioned numbers being ex-
 20 posed to view through the sight opening 13 of the lower roller 2. Numbers ranging from 2 upwardly are arranged upon the blank space 16 of the sheet 14, the said numbers indicating the "multiplier" of the
 25 problem to be determined or calculated while the said numerals from 1 to 100 and from $1\frac{1}{2}$ to $84\frac{1}{2}$ represent the "multiplicand." Between the said rows of numbers 17, the latter being divided and arranged oppo-
 30 sitely or in rows upon the calculating sheet 14, I provide predetermined numerals comprising the "product" or the result of the calculation desired.

In operation, the turning of the crank
 35 handle 10 will shift the position of the sheet 14 upon the rollers and will bring the desired numeral or multiplier at the sight opening 13 of either roller. For instance, the machine may be stopped at
 40 "11"; and if you desire to multiply "11" by "27" all that is necessary is to glance at the numeral 27 of the multiplicand and the product or result which is 297, the latter being placed in the space 18 of the sheet
 45 directly beneath the numeral 27. If an uneven number is to be calculated for example, 11 by $65\frac{1}{2}$, a glance at $65\frac{1}{2}$ will show $720\frac{1}{2}$ directly therebeneath, the product of such multiplication.

50 It will be seen from the above, taken in connection with the accompanying drawings that both sides or faces of the sheet 14 are utilized for computing or calculating purposes; that the operation of the

crank handle 10 for shifting the numerals 55 upon the said sheet is all that is necessary to calculate or obtain the product of the example to be computed; and that the provision of the eccentric pivotal mounting of the casing will allow the entire machine to
 60 be tilted or swung into a more convenient position.

In reduction to practice, I have found that the form of my invention, illustrated in the drawings and referred to in the above de- 65 scription, as the preferred embodiment, is the most efficient and practical, yet realizing that the conditions concurrent with the adoption of my device will necessarily vary, I desire to emphasize the fact that various 70 minor changes in details of construction, proportion and arrangement of parts may be resorted to, when required, without sacrificing any of the advantages of my invention, as defined in the appended claim. 75

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

A calculating device including in combination a pair of spaced apart upright supports, the said supports each having an arcuate aligned slot formed therein, a casing eccentrically pivoted between the said supports, the said casing having sight openings 80 formed therein, a pair of parallel spaced apart rollers mounted within said casing, shafts upon which said rollers are rigidly mounted, one of said shafts adapted to extend through the said slots to provide for the tilting of the casing from the eccentric 90 pivot point, means including meshing gears mounted one upon each of the said shafts for simultaneously rotating the said rollers in an opposite direction, means for rotating one of said shafts, and a calculating sheet 95 having numerals arranged upon each side thereof, the said sheet adapted to be wound oppositely upon the said rollers for exposing to view the said numerals through the said sight openings of the casing during the 100 rotation of the rollers, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CLOYCE D. DUFFIELD.

Witnesses:

GUY A. SCHUTT,
 J. AUSTIN JONES.