

No. 764,544.

PATENTED JULY 12, 1904.

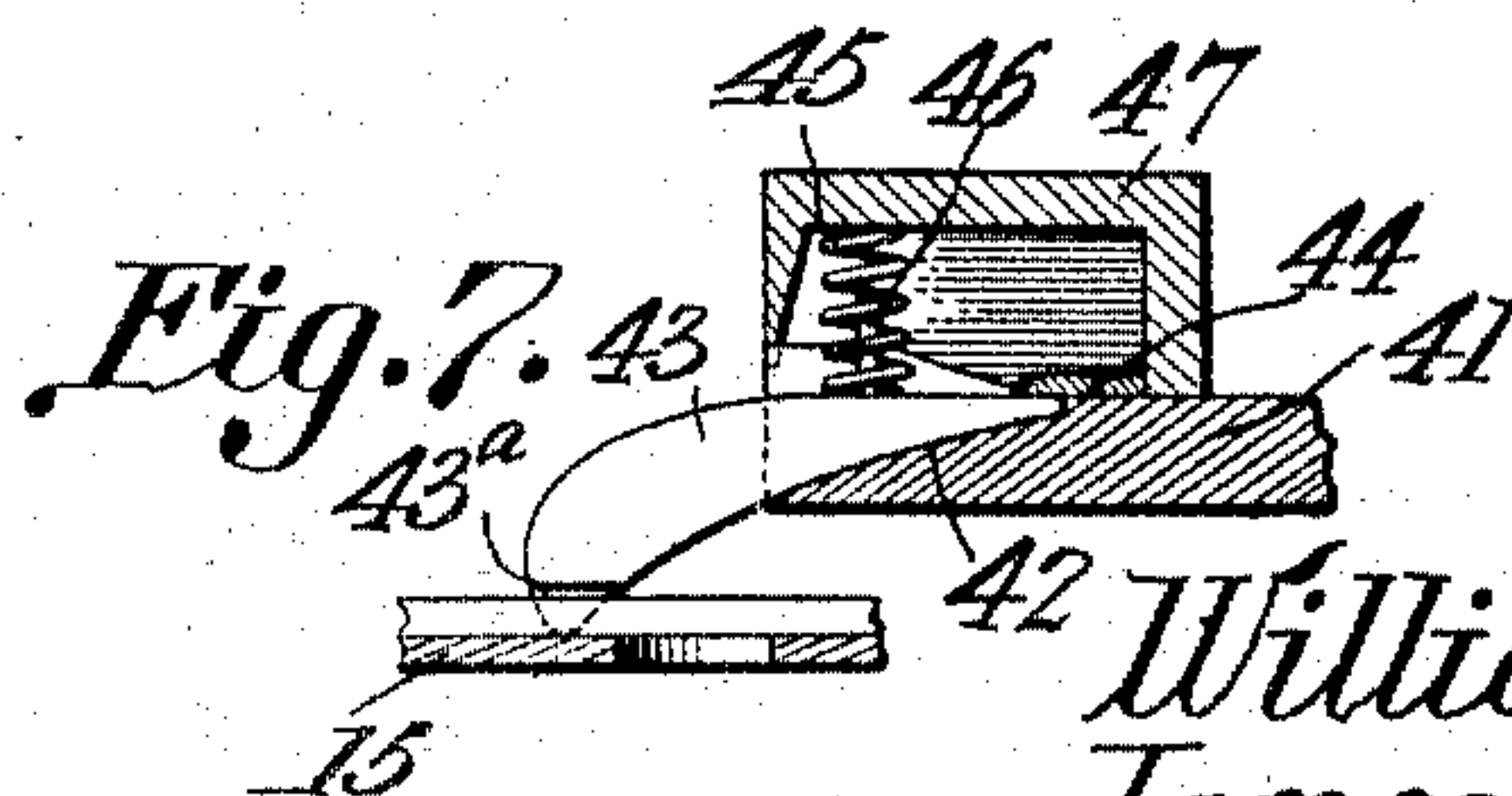
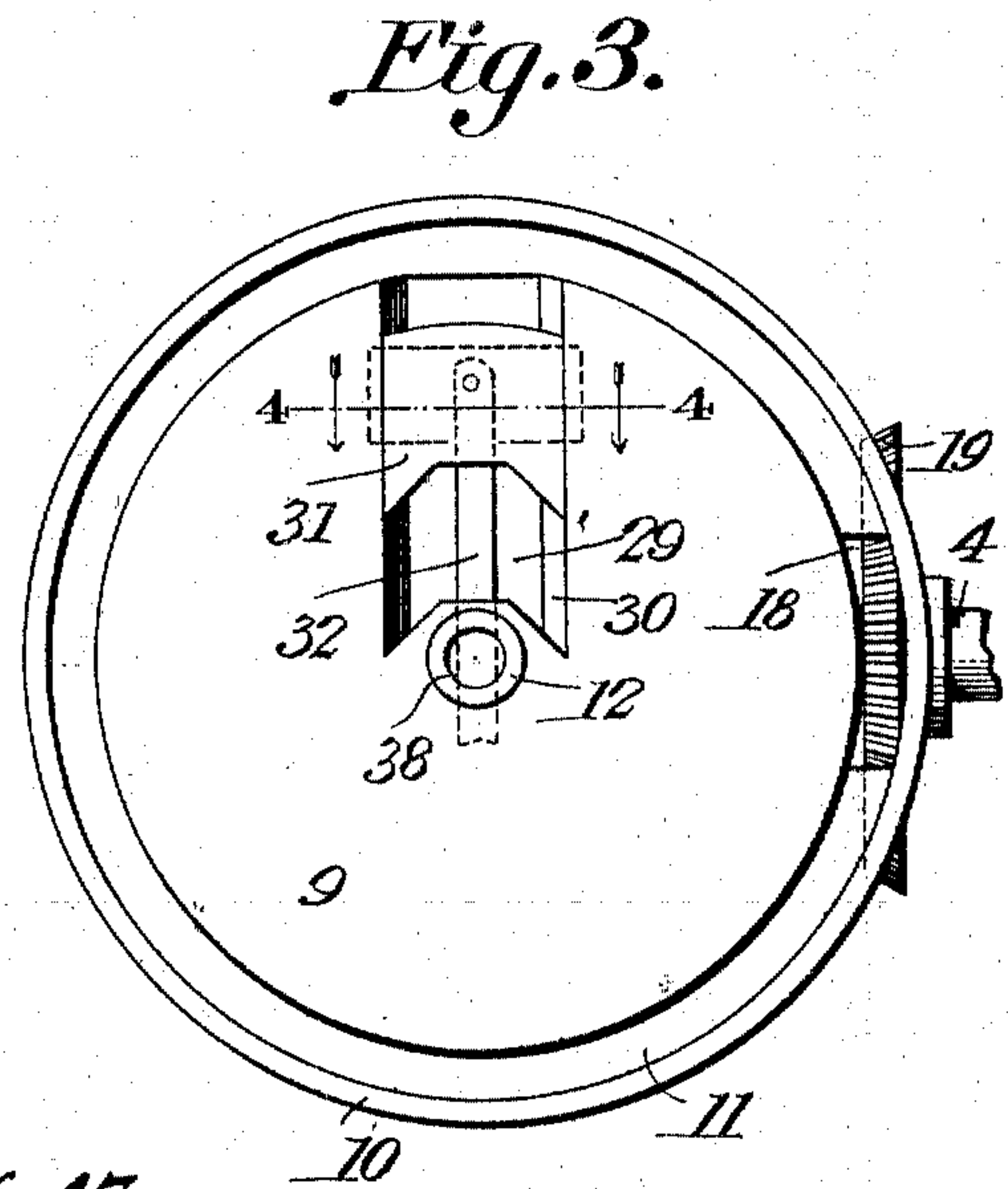
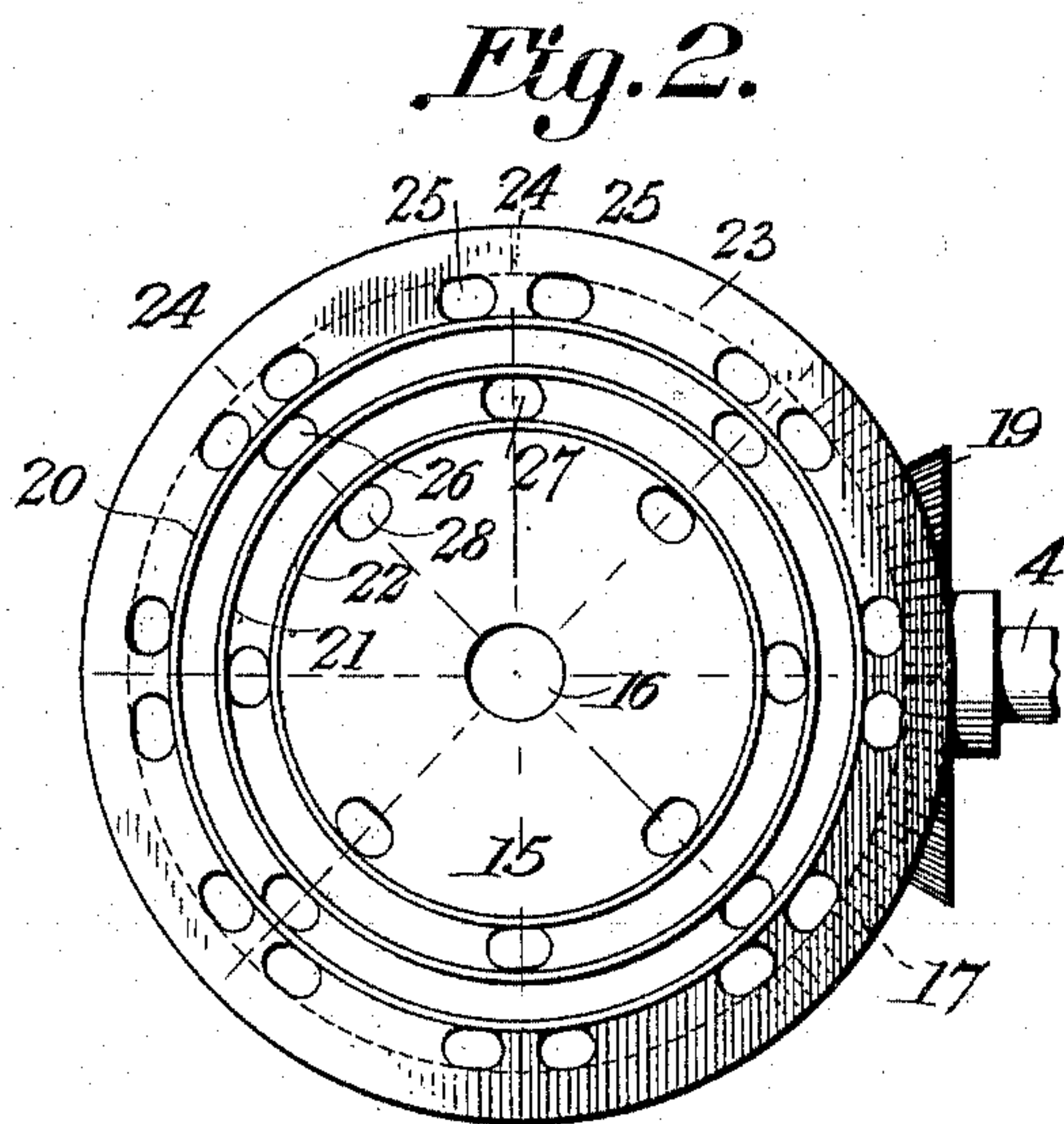
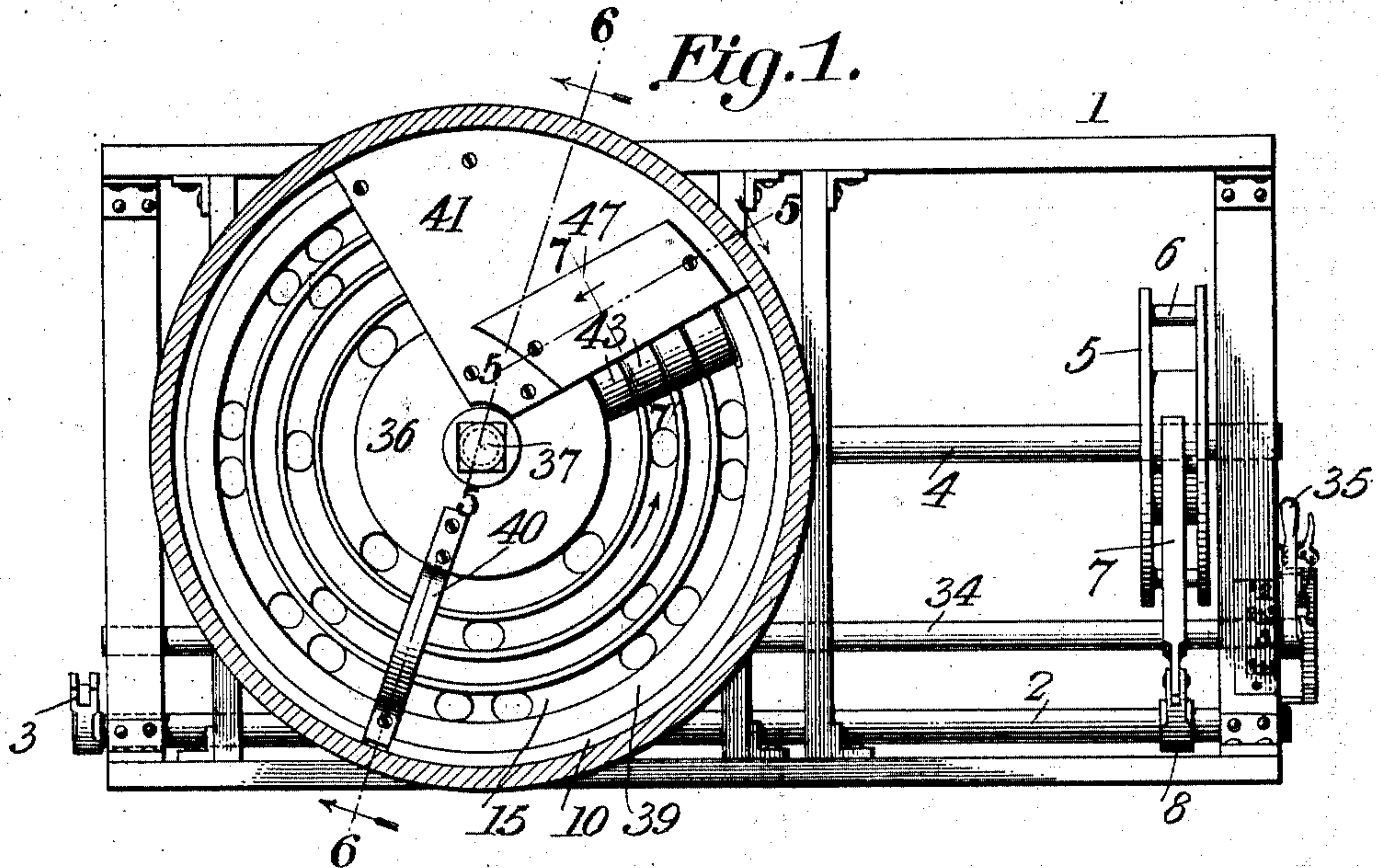
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SEED DROPPING MECHANISM.

APPLICATION FILED OCT. 27, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



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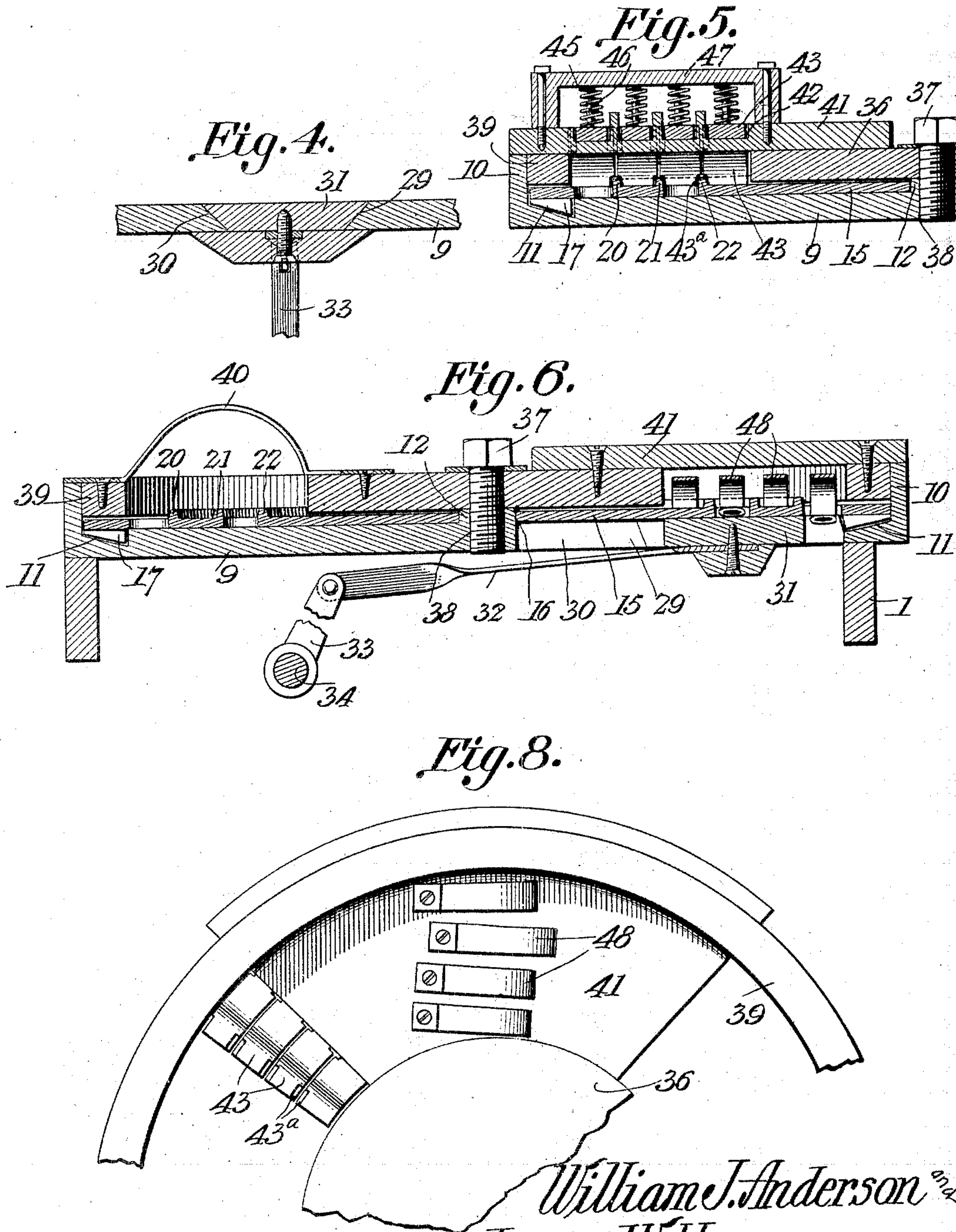
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3 SHEETS—SHEET 2.



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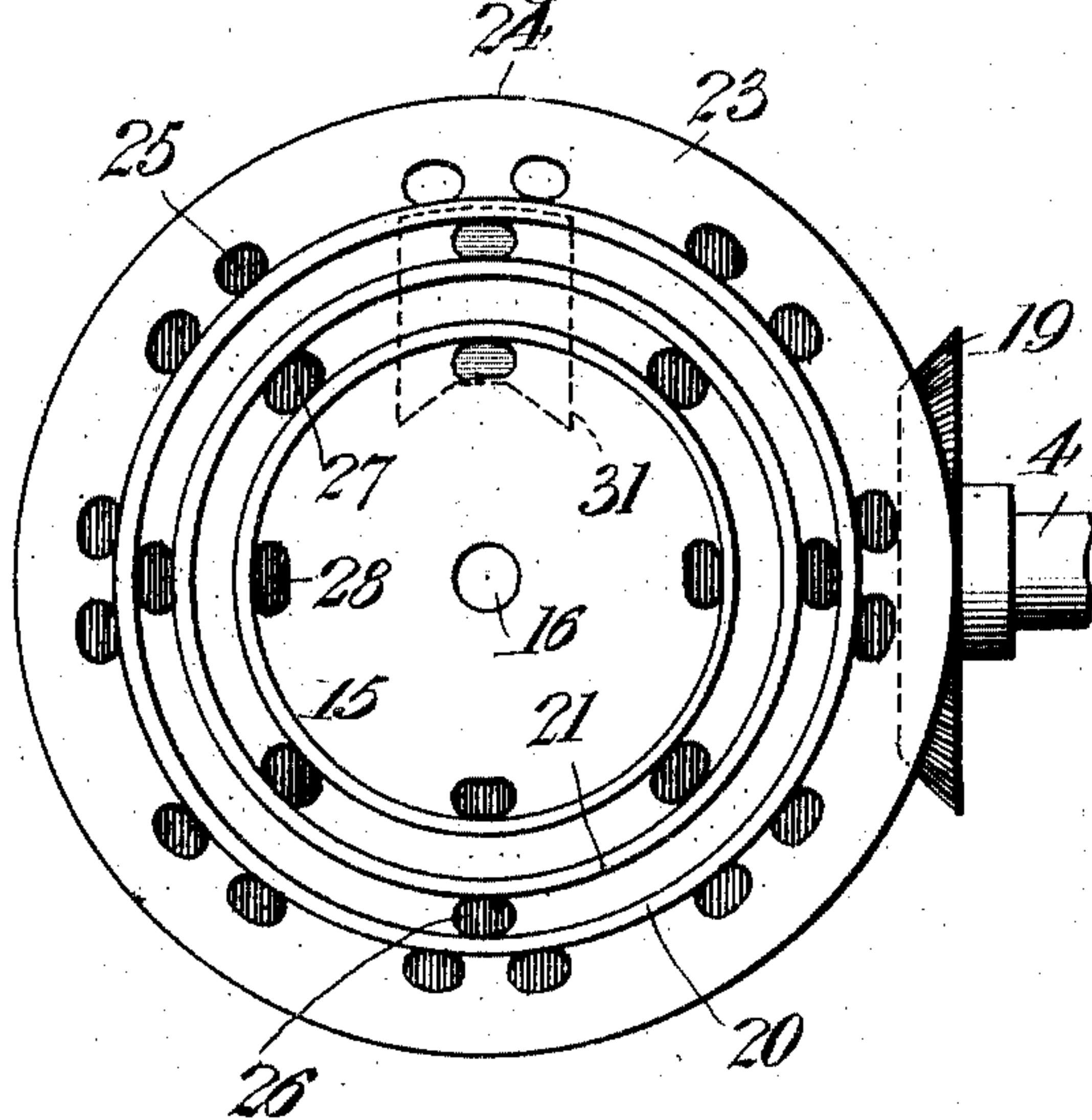
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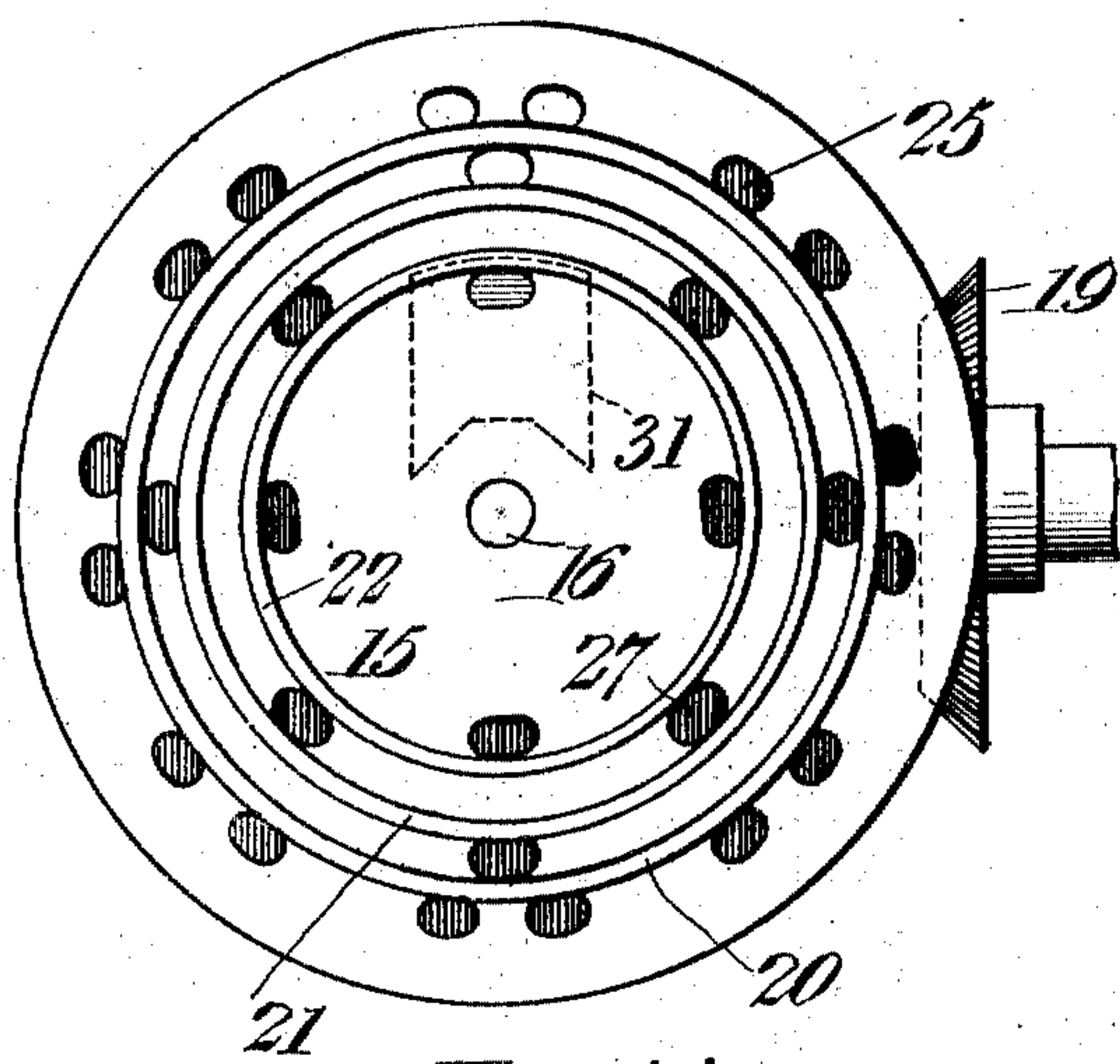
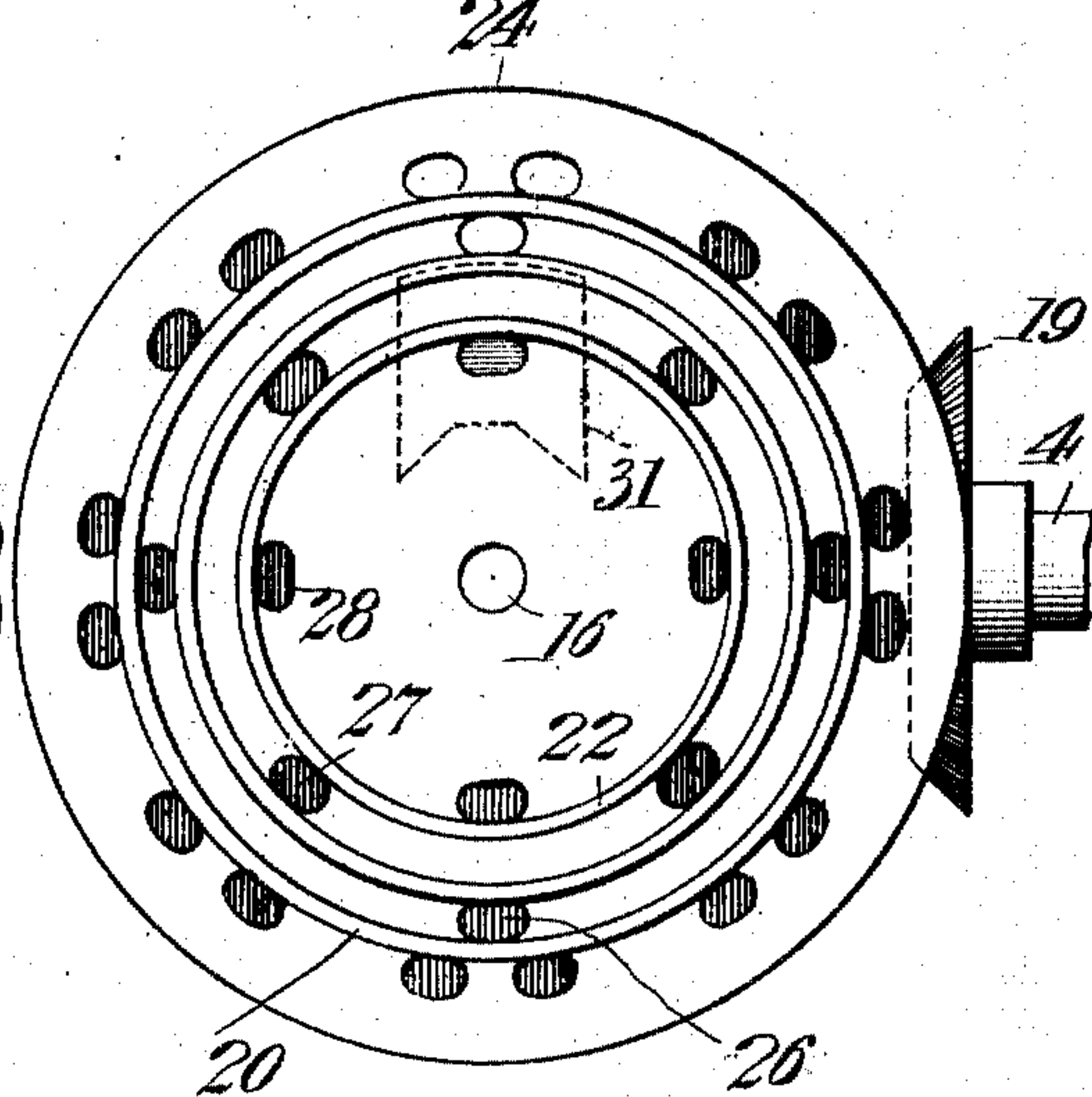
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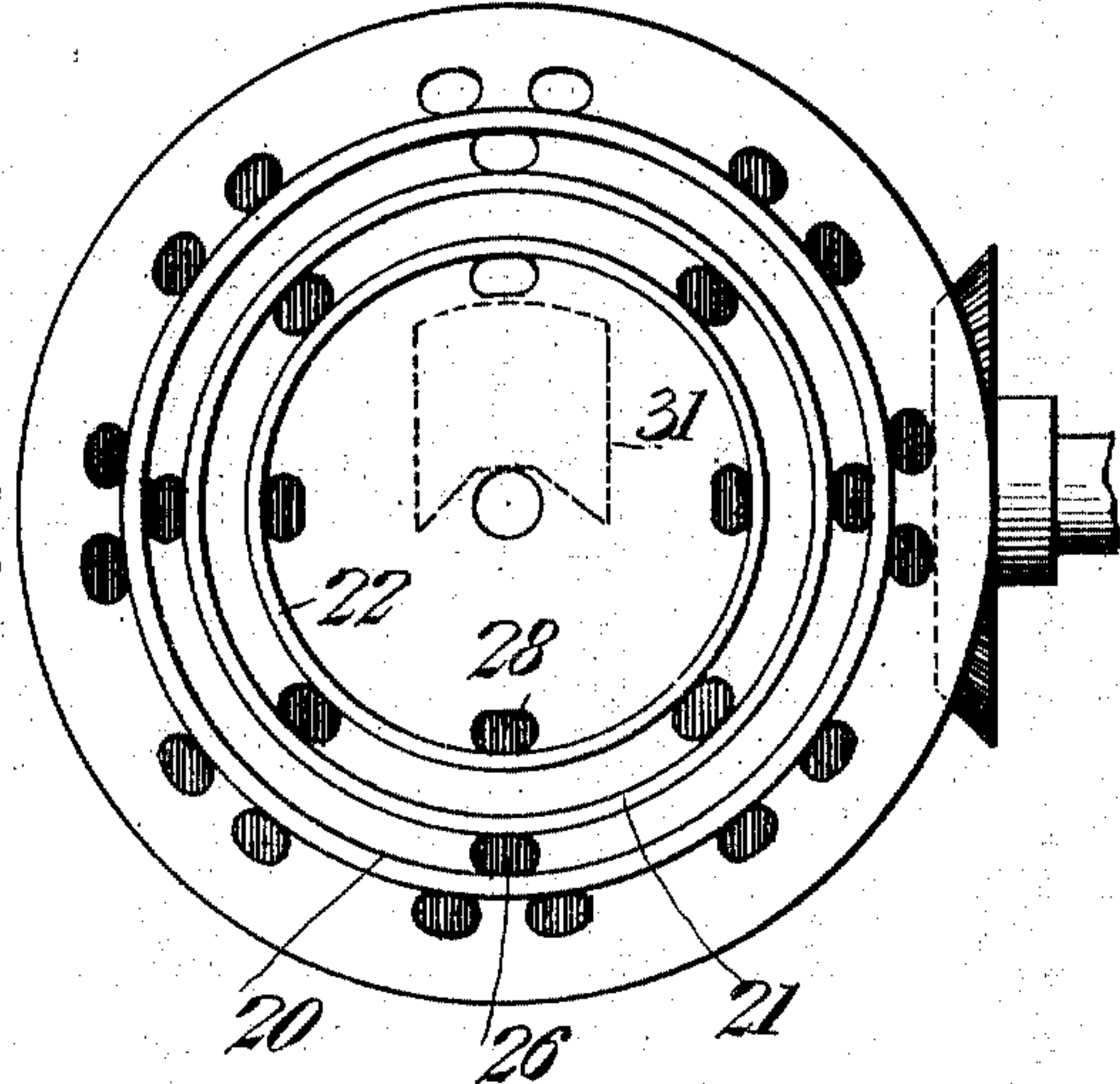
*Fig. 9.*



*Fig. 10.*



*Fig. 11.*



*Fig. 12.*

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# UNITED STATES PATENT OFFICE.

WILLIAM J. ANDERSON AND JAMES W. HORNEY, OF LODA, ILLINOIS.

## SEED-DROPPING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 764,544, dated July 12, 1904.

Application filed October 27, 1903. Serial No. 178,762. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM J. ANDERSON and JAMES W. HORNEY, citizens of the United States, residing at Loda, in the county of Iroquois and State of Illinois, have invented a new and useful Seed-Dropping Mechanism, of which the following is a specification.

This invention relates to certain new and useful improvements in seed-dropping mechanism.

The invention has for its object to provide a device of this class by means of which charges of equal or of varying size or of any desired number of seeds may be deposited at each operation within the limits of the size of the machine or apparatus.

Our invention, moreover, provides for the depositing of alternate numbers of seeds at each operation. Thus, for instance, the device may be set so as to deposit two seeds at each operation, or it may deposit alternately two and three seeds, or it may deposit three seeds at each operation, or it may deposit alternately three and four seeds at each operation, and so on, thus to provide for the most perfect distribution of the seeds, according to the condition of the seeds and the soil.

With these and other objects in view our invention consists in the improved construction, arrangement, and combination of parts which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings we have elected to show our invention applied to one of that class of corn-planters which are equipped with a rotary seed-disk to which a partial rotation is imparted at each operation of the checking mechanism, said seed-disk being provided with seed cups or openings receiving the seed from the hopper and carrying it to the discharge-opening in the base-plate of the seedbox, through which it may escape into the seed tube or shoe; but it will be understood that the invention is equally applicable to other forms of seed-planters and that we do not limit ourselves to the exact construction and arrangement of parts herein shown.

In said drawings, Figure 1 is a plan view of a portion of a planter-frame equipped with

our improvement, surplus parts of the frame and hopper having been removed. Fig. 2 is a plan view of the seed-disk. Fig. 3 is a plan view showing the bottom of the hopper from which the seed-disk and cut-off devices have been removed. Fig. 4 is a transverse sectional view taken on the line 4 4 in Fig. 3. Fig. 5 is a vertical sectional view taken on the line 5 5 in Fig. 1. Fig. 6 is an axial sectional view taken on the line 6 6 in Fig. 1. Fig. 7 is a detail sectional view taken on the line 7 7 in Fig. 1. Fig. 8 is an inverted plan view of the cut-off devices. Figs. 9, 10, 11, and 12 are diagrammatic plan views showing the seed-disk of the invention and indicating the cut-off slide in various positions with relation to said seed-disk.

Corresponding parts in the several figures are indicated by similar numerals of reference.

1 designates parts of the frame of an ordinary check-row planter, which carries a rock-shaft 2, operated by the tappet-lever 3 in the ordinary well-known manner.

4 is a shaft suitably journaled in the frame and carrying a wheel 5, having means, such as cross-pieces 6, adapted to be engaged by a forked pawl 7, pivotally connected with an arm 8, extending from the rock-shaft, so that at each oscillation of the latter the wheel 5 shall be partially rotated. Means for retracting the arm 8, carrying the pawl 7, are obviously provided; but such means have not been shown in the drawings, because they form a part of the equipment of ordinary check-row planters.

In a complete machine two or more hoppers may be provided; but in the drawings hereto annexed only one hopper has been shown, this being requisite for a perfect understanding of the invention. Thus while hereinafter only the single hopper will be referred to it will be understood that additional hoppers, or at least an additional hopper, will be usually employed. The hopper, then, is composed of a base-plate 9, preferably circular in shape and surrounded by an annular ring 10, constituting a housing. An annular beveled groove 11 is formed in the base-plate adjacent to the housing-ring, and the base-



plate is also provided with a centrally-disposed upwardly-extending circular boss 12.

15 15 designates the seed-plate, which is circular in shape and is fitted within the housing-ring, said plate or disk being provided with a central opening 16, engaging the boss 12, whereby the rotary movement of said disk is steadied. The seed-disk is provided on its under side with a circumferential bevel-gear, 10 which is normally accommodated in the beveled groove 11, the latter being provided with a slot 18, through which extends the teeth of a bevel-pinion 19, mounted upon the shaft 4 and meshing with the bevel-gear 17.

15 The upper side of the seed-disk is provided with a plurality of concentric ribs or ridges, of which in the accompanying drawings three have been shown, said ribs being numbered consecutively 20, 21, and 22, the outer 20 rib being numbered 20 and the inner one 22. The outer rib 20 is disposed at a greater distance from the outer edge of the disk than the thickness between any two of the ribs, which latter are disposed equidistantly apart. 25 The disk is provided with a plurality of perforations forming seed-cups, and these perforations or cups are disposed in a special manner, which we will now proceed to describe.

Let the seed-disk be divided by imaginary 30 radial lines into a suitable number of sections or sectors, of which in the drawings eight have been shown, each sector being designated 23 and each dividing-line 24. Adjacent to the outer side of the outer rib 20 we form closely 35 adjacent to each dividing-line 24 two openings or seed-cups 25. These cups or openings are formed closely adjacent to each other, as shown. Between the ribs 20 and 21 we form openings 26, which are disposed directly across 40 alternate dividing-lines 24. Between the ribs 21 and 22 we form openings 27 across alternate dividing-lines 24, but intercurrently with the openings 26. Adjacent to the inner side of the inner rib 22 we form additional open- 45 ings 28, which are disposed in alinement with the openings 26 and intercurrently with the openings 27. One or more additional sets of ribs and perforations might be used, but the number illustrated in the drawings is 50 deemed sufficient to clearly illustrate the invention. In the drawings, moreover, the disk has been shown as divided by eight radial lines into eight sectors, each set of seed-cups being thus equally spaced apart.

55 The base-plate of the hopper is provided with a slot 29, approximately rectangular in shape, extending from the center of the disk to the beveled groove 11 and having downwardly-inclined or beveled edges 30, supporting a slide 31 of suitable length. This slide 60 is connected by a strap 32, secured to its under side, with an arm 33 extending from a rock-shaft 34, having at one end an operating-lever 35, whereby it may be conveniently manipulated by the driver or operator of the ma-

chine. The slide 31 is so disposed that its upper side shall be flush with the upper side of the base-plate.

When the seed-disk is placed in the housing provided for it, it should be so disposed that 70 two of the cups or openings 25 shall be in alinement with the outer end of the slot 29. The gearing and operating mechanism should also be so proportioned that at each throw of the lever 3 the seed-disk shall be rotated sufficiently to bring the next set of seed-cups 25 75 into alinement with the slot 29. Now it is obvious that when the slide 31 is so positioned that the outer end of the slot 29 only shall be uncovered at each movement of the disk, as 80 shown in Fig. 9, the contents of the two seed-cups will be permitted to drop through said slot to be conducted to the ground by means not shown in the drawings. Each cup or perforation in the seed-disk is obviously of such 85 a size as to accommodate only a single kernel of corn. When the slide 31 is moved toward the center of the base-plate, so as to uncover the space between the first and second ribs 20 and 21 upon the upper side of the seed-disk, as shown in Fig. 10, it is obvious that at each 90 operation of the seed-disk the contents of two and three seed-cups will be alternately permitted to escape. A still further movement of the seed-slide in the direction of the center 95 or axis will result in the uncovering of the space lying between the perimeter of the disk and the inner side of the rib 22, as shown in Fig. 11. Each operation of the disk will thus result in the dropping of the contents of three 100 seed-cups, while by moving the seed-slide still farther in an inward direction to the position shown in Fig. 12 the portion of the disk having the cups 28 will be uncovered. Thus the 105 rotation or operation of the disk will result in the dropping alternately of the contents of three and four cups. The cups being, as stated, of a capacity to carry only a single kernel each, it is obvious that the number of seeds dropped may be gaged and regulated with absolute certainty. 110

It is obvious that by the peculiar construction herein shown not less than two kernels may be dropped at any one time, this being 115 the lowest number that it is usually desirable to deposit in each hill. It is obvious, however, that it would be no departure from our invention to substitute a single seed-cup for the two that have been shown. It is also evident that, given a disk of sufficient size, the 120 alternate intercurrent arrangement of circumferentially-disposed seed-cups may be continued indefinitely. In the drawings hereto annexed, however, we have shown what will be usually considered a simple and practical arrangement. 125

The seed-disk is retained in position upon the base-plate of the hopper by means of a central cap-plate 36, which rests upon the upper edge of the boss 12 in such a manner as 130



to avoid unnecessary frictional contact between said cap-plate and the disk, the former being secured by means of a screw or bolt 37, extending through a central perforation in the cap-plate and engaging a screw-threaded socket 38 in the boss 12. An annular closure or ring 39 is also disposed to fit closely within the annular housing-ring 10 above the edge of the seed-disk, which latter is thereby guided and held in such a manner that disengagement between the teeth of the annular bevel-gear 17 and the pinion 19 shall be absolutely impossible. The cap-plate 36 and the ring 39 are connected by means of an arched brace 40 and also by means of a cut-off plate 41, the latter being sector-shaped, as shown. Said cut-off plate is provided at its front edge (by the "front edge" we mean the edge under which the seed-cups of the rotary seed-disk enter when the disk is rotated in the proper direction) with a plurality of spaced recesses 42, in each of which is placed a cut-off finger 43, the rear end of which is tapered and supported under a cross-piece 44, while the front ends of said fingers are curved downwardly, so as to contact with the upper faces of the seed-disk between the ribs 20, 21, and 22, and adjacent to the outer and inner ribs notches 43<sup>a</sup> being formed at the lower corners of each finger to accommodate the adjacent ribs. In other words, a separate cut-off finger is provided for each circumferential series of seed-cups. The front or engaging ends of these cut-off fingers are forced downwardly by means of springs 45, coiled upon pins 46, extending upwardly from said fingers and bearing against the under side of a cap 47, which is suitably secured to the upper side of the cut-off plate above the said cut-off fingers. To the under side of the cut-off plate we secure a plurality of flat ejector-springs 48, extending rearwardly and downwardly, so as to bear upon the upper side of the seed disk and cups. The free ends of these springs are disposed directly above the slot 29, and said springs thus serve in case the kernels should exhibit a tendency to stick in the seed-cups to eject said kernels in a downward direction to the exit.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of our invention will be readily understood. It is obvious that by properly setting the slide 31 the device may be so adjusted as to plant with absolute certainty and regularity the desired number of seeds in each hill and that, furthermore, by the peculiar arrangement of the seed-cups in the disk alternate numbers of seeds may be planted in alternate hills. To secure the slide 31 at the proper adjustment, the lever 35, by means of which said slide is operated, may be provided with simple means, such as a spring-actuated dog and rack, where- by it will be held in adjusted position. Such

devices, however, are well known in the art and are no part of our invention.

We desire it to be distinctly understood that the gist of our invention resides, first, in means forming part of the seed-dropping mechanism, whereby by successive or alternate operations of the dropping mechanism charges of seed varying in quantity may be dropped or deposited; secondly, in a construction whereby the seed-dropping mechanism by a simple adjustment of parts may be arranged to drop at each operation a charge of equal size or consisting of the same number of seeds. We prefer to define the means whereby differential charges are alternately or successively delivered as being automatic—that is, with regard to effecting the variation as to the size or quantity of the charges of seed deposited, being well aware that seed-dropping mechanism as generally known and used includes means for automatically effecting the dropping of the charges. We desire it to be understood that automatic dropping means of this class we do not claim. On the other hand, we do not limit ourselves to the specific means herein shown and described for carrying our invention into effect, inasmuch as under our invention many structural changes and alterations might be made in the means for automatically varying the quantity deposited by the exercise of ordinary mechanical skill.

Therefore, having thus described our invention, we claim and desire to secure by Letters Patent of the United States—

1. In a seed-planter, means for depositing automatically variable charges of seed.

2. In a seed-planter, means for automatically varying the quantity of seed deposited.

3. In a seed-planter, means for automatically and alternately depositing different quantities of seed.

4. In a seed-planter, means for automatically and successively depositing different numbers of seeds.

5. In a seed-planter, intermittently-operated means for alternately depositing charges of seed, varying in quantity.

6. In a seed-planter, intermittently-operated, automatic means for depositing varying charges of seed.

7. In a seed-planter, means for dropping automatically variable charges of seed, and regulating means to determine the charges to be successively dropped.

8. A seed-planter having seed-dropping means for depositing variable charges of seed alternately and successively, and means for predetermining the charges to be delivered.

9. In a seed-planter, seed-dropping means for automatically varying the quantity of seed deposited, and manually-adjustable means for regulating the seed-dropping mechanism to drop at each discharge an equal quantity of seed.



10. In a seed-planter, an intermittently-revoluble seed-disk having concentric spacing-ribs, pairs of seed-cups spaced equidistantly and disposed adjacent to the outer rib, and additional seed-cups disposed between the concentric ribs and adjacent to the inner rib in alinement with and alternately with relation to the outer pairs of seed-cups and intercurrently with relation to each other.

11. In a seed-planter, a seed-disk having a plurality of circumferential series of seed-cups, each adapted to hold a single kernel, the seed-cups of each circumferential series being disposed intercurrently with those of adjacent series, and a cut-off whereby the delivery from any desired number of the circumferential series of cups may be obstructed.

12. In a planter, a hopper having a base-plate, a circular housing-ring, and a beveled groove adjacent to said housing-ring, a seed-disk supported upon said bottom plate and having a bevel-gear formed circumferentially upon its under side, a pinion extending through a slot in the bottom of the beveled recess and meshing with said bevel-gear, and means for supporting and for intermittently rotating said pinion.

13. In a planter, a base-plate having a central upwardly-extending boss having an internally-threaded recess, a circular housing surrounding the base-plate, a seed-disk supported upon the base-plate and having a perforation engaging the boss, a cap-plate resting upon the upper edge of the latter and having a central perforation, and a bolt engaging said central perforation and the internally-threaded recess of the boss.

14. In a planter, a circular base-plate having a central, upwardly-extending boss with an internally-threaded recess, a housing surrounding said base-plate, an annular beveled groove in the latter, a seed-disk supported revolvably upon the base, having a central perforation engaging the boss and provided with a circumferential bevel-gear housed in the beveled groove, a pinion extending through a slot in said groove and meshing with said bevel-gear, a cap-plate mounted upon the upper edge of the boss and spaced by the latter from frictional contact with the seed-disk, a connecting-bolt, an annular closure disposed above the

circumferential seed-plate, and means connecting said closure with the cap-plate.

15. In a planter, a circular base-plate having a circular housing-ring, a beveled groove adjacent to said housing-ring and an approximately rectangular slot extending from the center of the base-plate to the annular groove therein, said slot having beveled sides, a slide supported upon the beveled sides of said slot with its upper side flush with the upper side of the base-plate, means for adjusting said slide, a circular seed-disk supported upon the base-plate and having a bevel-gear engaging the annular beveled groove in the latter, a plurality of series of seed-cups formed in said seed-plate, the escape of the contents of said seed-cups being regulated by the slide, a cap-plate and an annular closure supported above the seed-disk, and connecting means between said cap-plate and annular closure, including a cut-off device.

16. In a planter, an intermittently-rotatable seed-disk having a plurality of series of seed-cups and annular ribs separating the cups of each series, in combination with spring-actuated cut-off fingers bearing upon the surface of the disk and provided at their edges with notches accommodating and engaging the annular ribs.

17. In a planter, an intermittently-rotatable seed-disk provided with equidistantly-spaced series of seed-cups and annular ribs spacing the seed-cups of each series apart, in combination with a cut-off including a plurality of individual spring-actuated fingers and ejecting devices consisting of flat springs secured to the under side of the cut-off plate, extending downwardly and rearwardly, bearing upon the surface of the seed-disk between the annular ribs of the latter and adapted to force the contents of the seed-cups into the final exit.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

WILLIAM J. ANDERSON.  
JAMES W. HORNEY.

Witnesses:

ARTHUR H. ANDERSON,  
JOHN B. ANDERSON.