

No. 724,774.

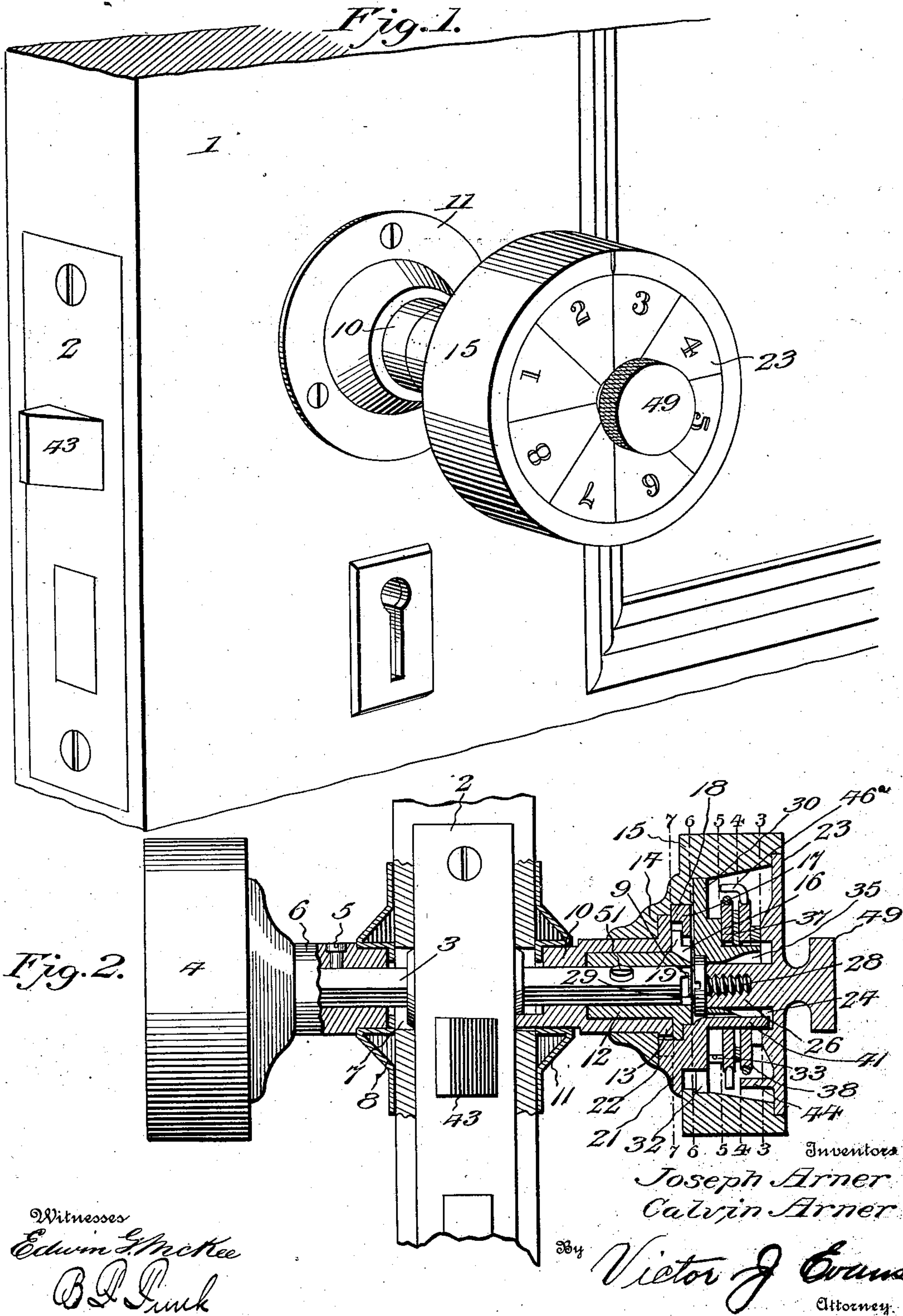
PATENTED APR. 7, 1903.

J. & C. ARNER.
COMBINATION LOCK.

APPLICATION FILED JULY 23, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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Fig. 3.

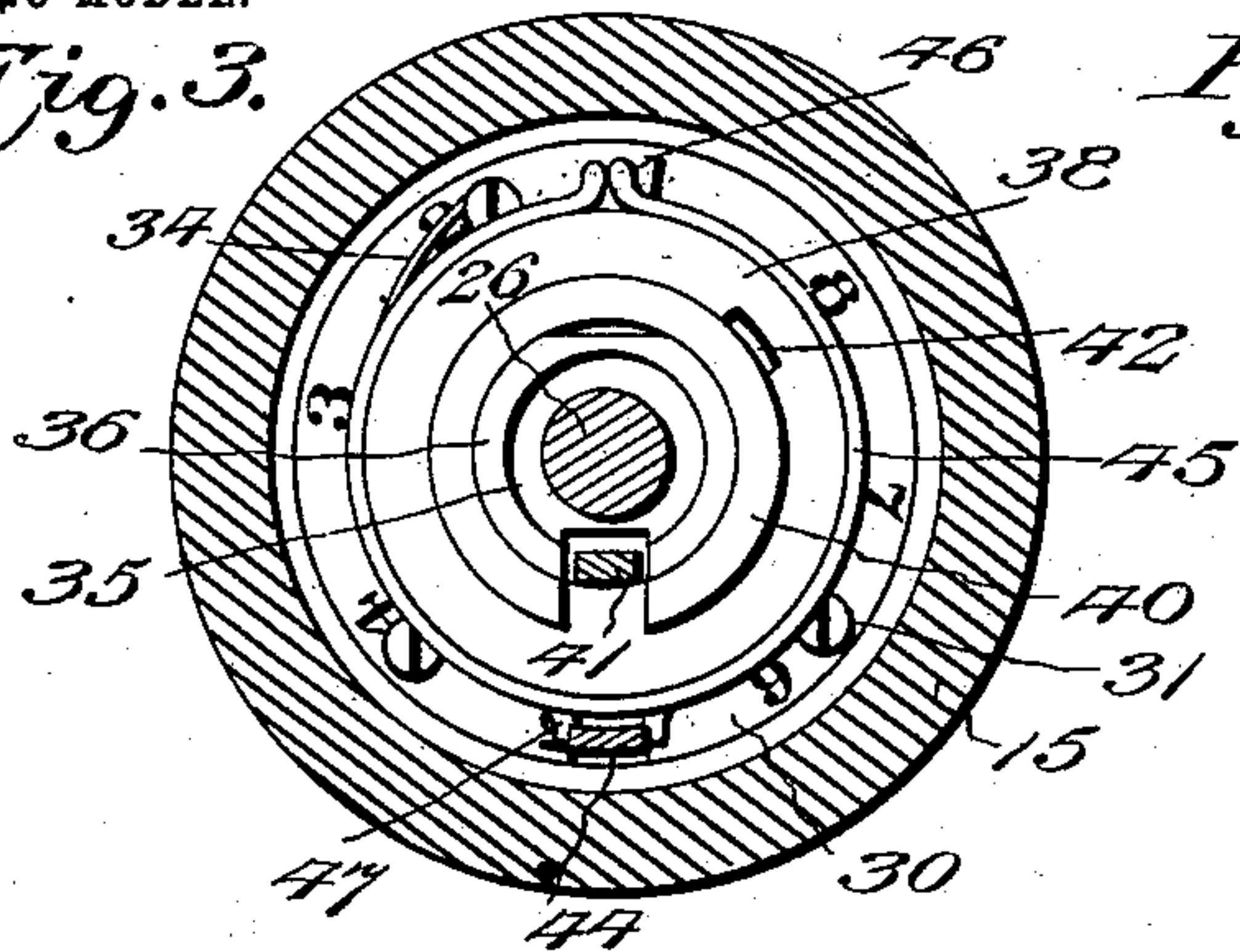


Fig. 4.

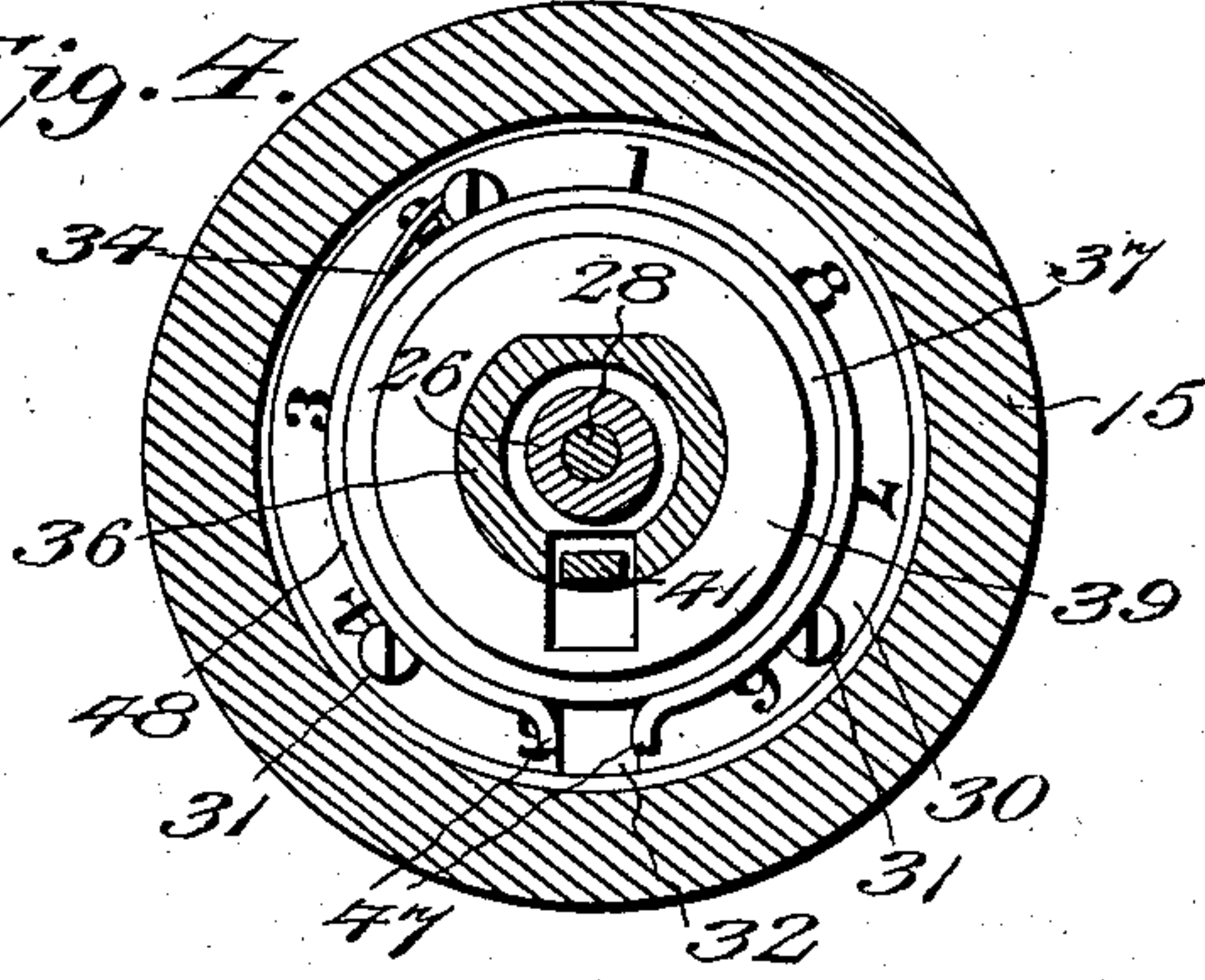


Fig. 5.

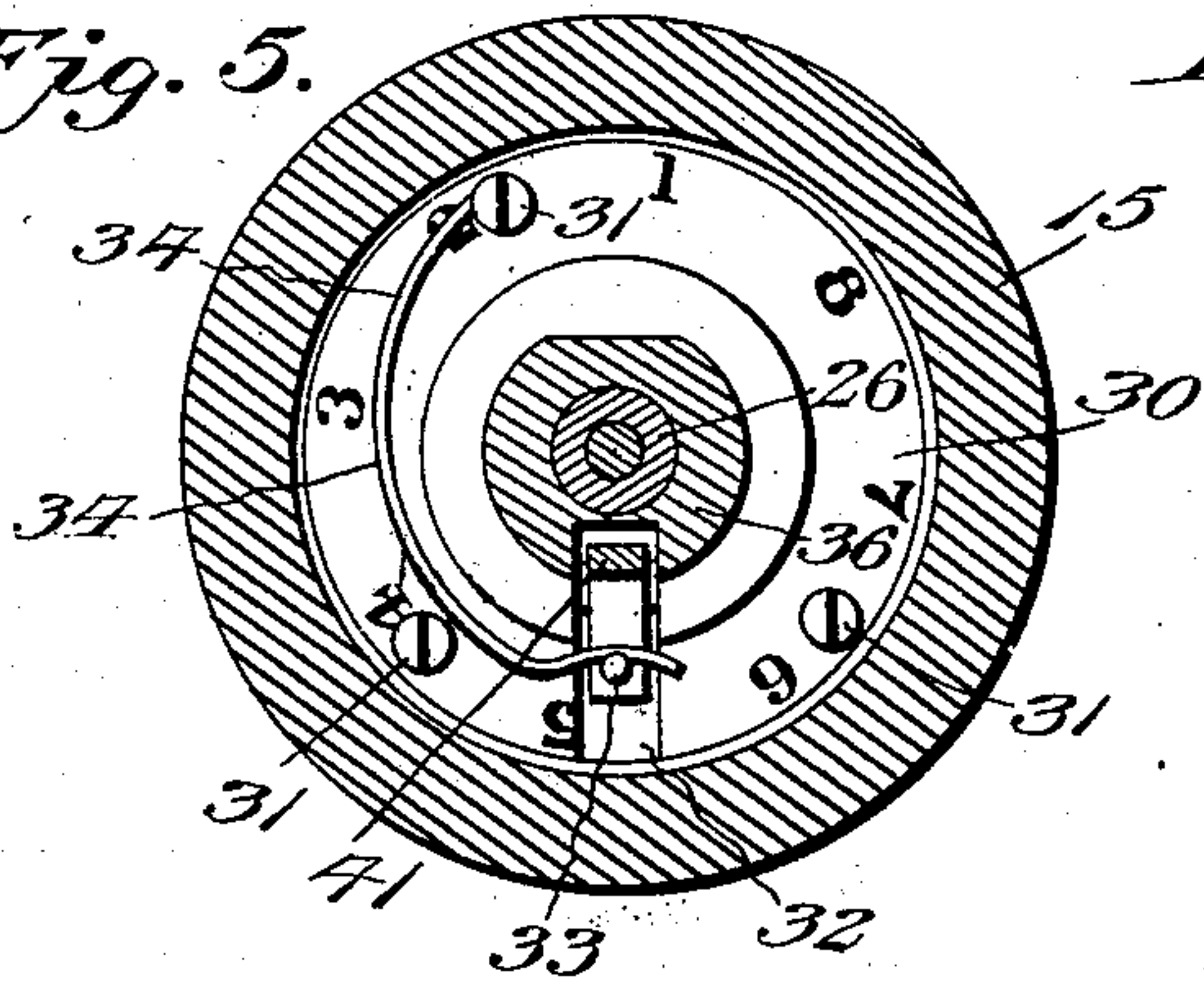


Fig. 6.

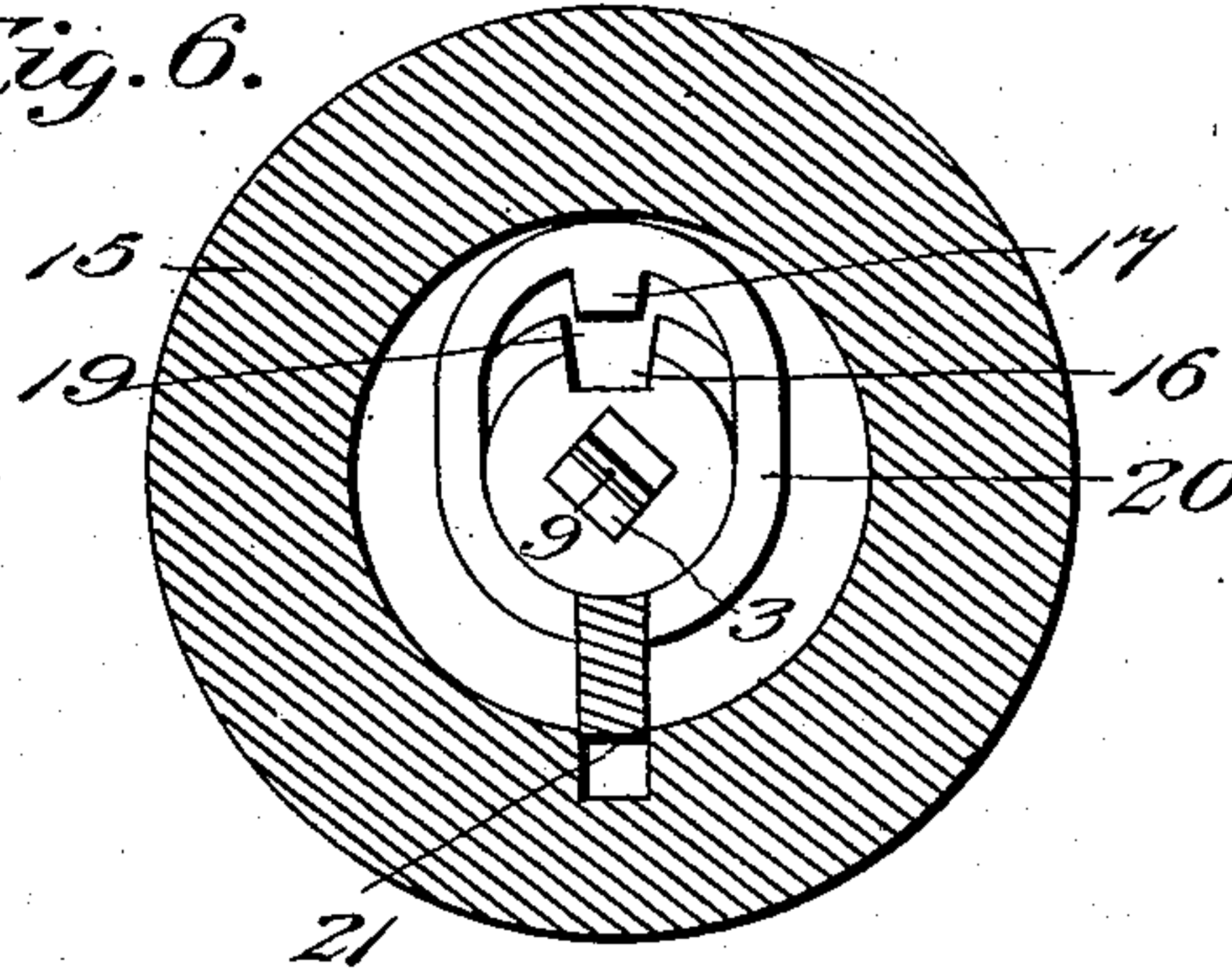


Fig. 7.

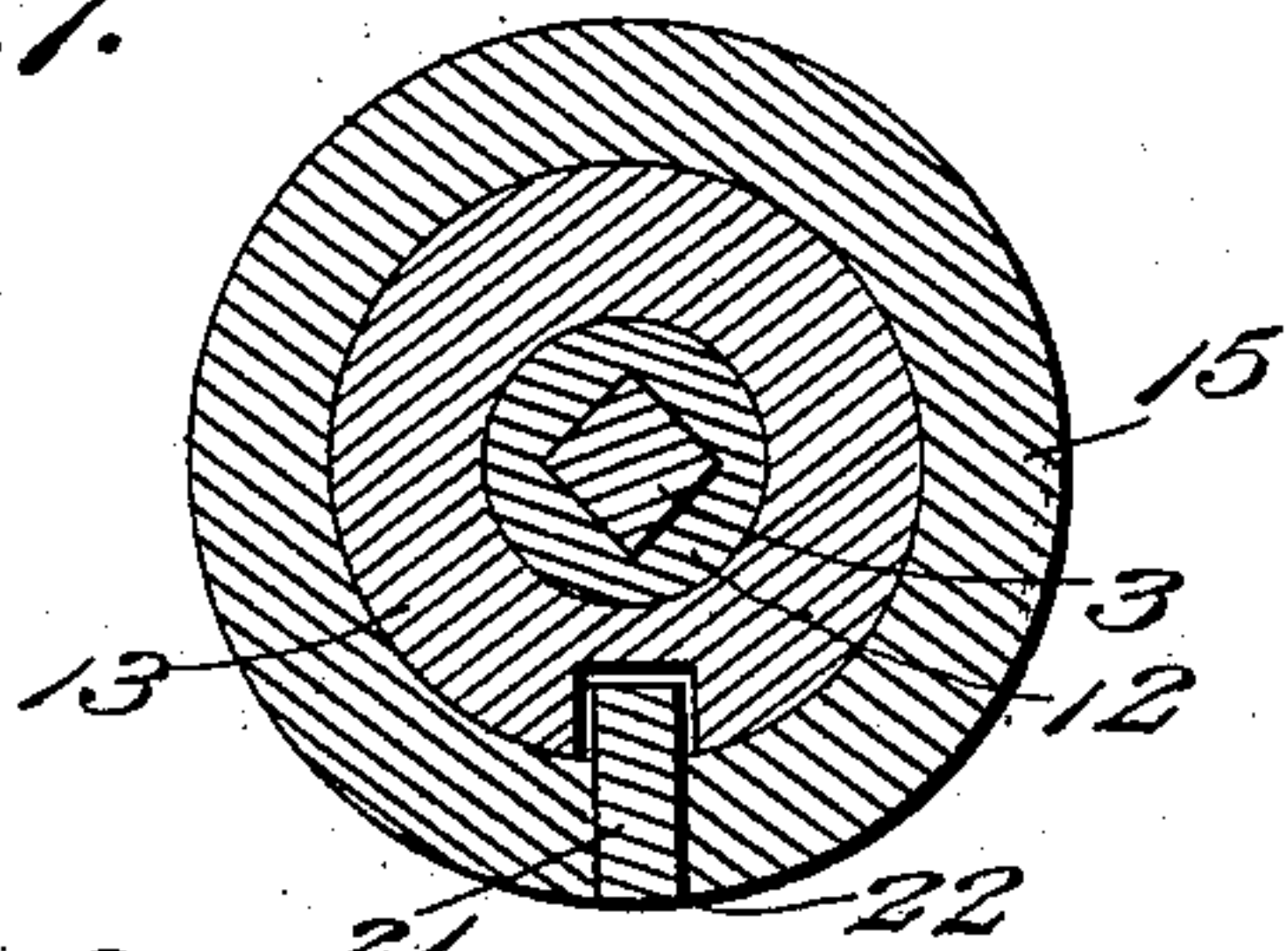


Fig. 8.

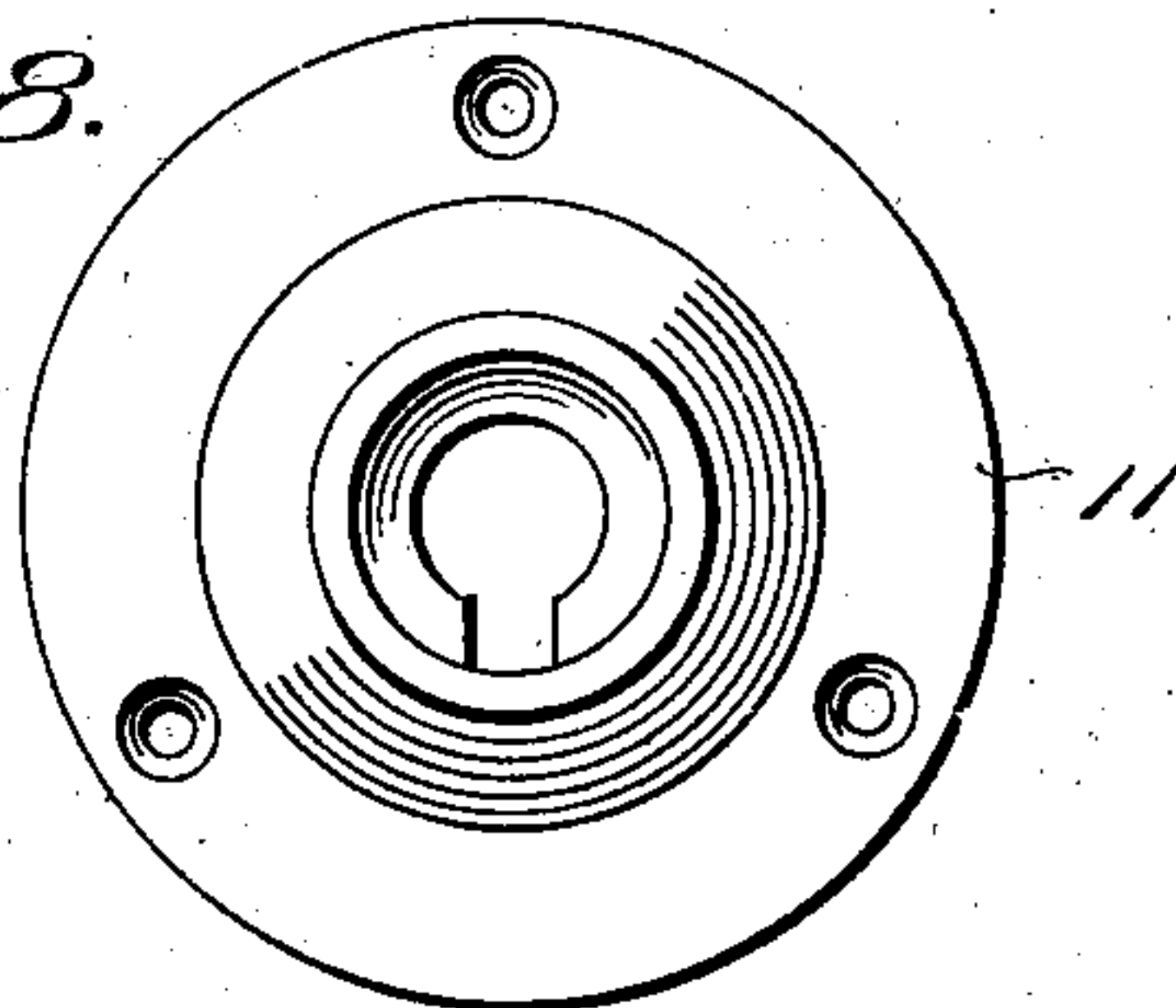


Fig. 9.

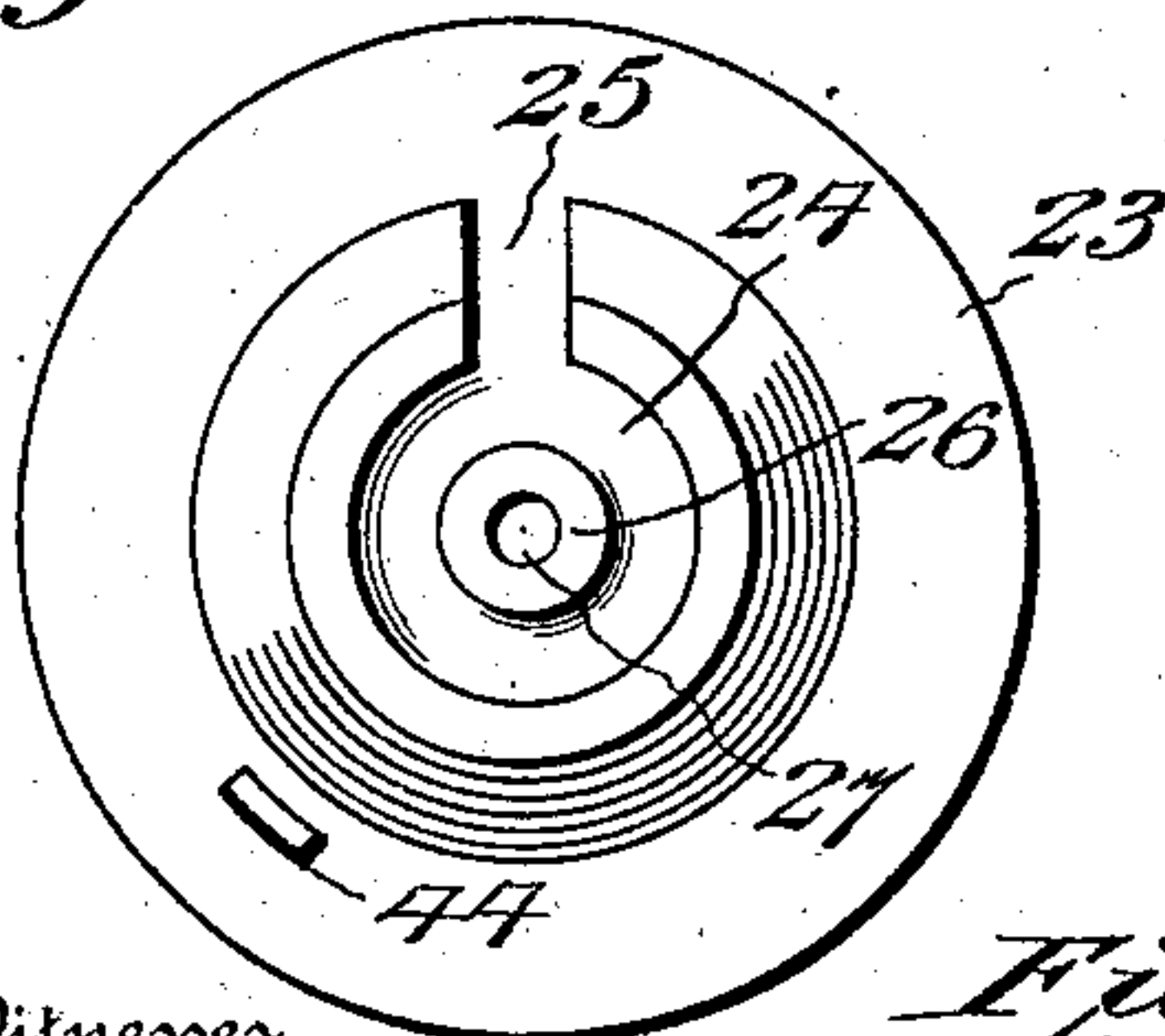


Fig. 10.

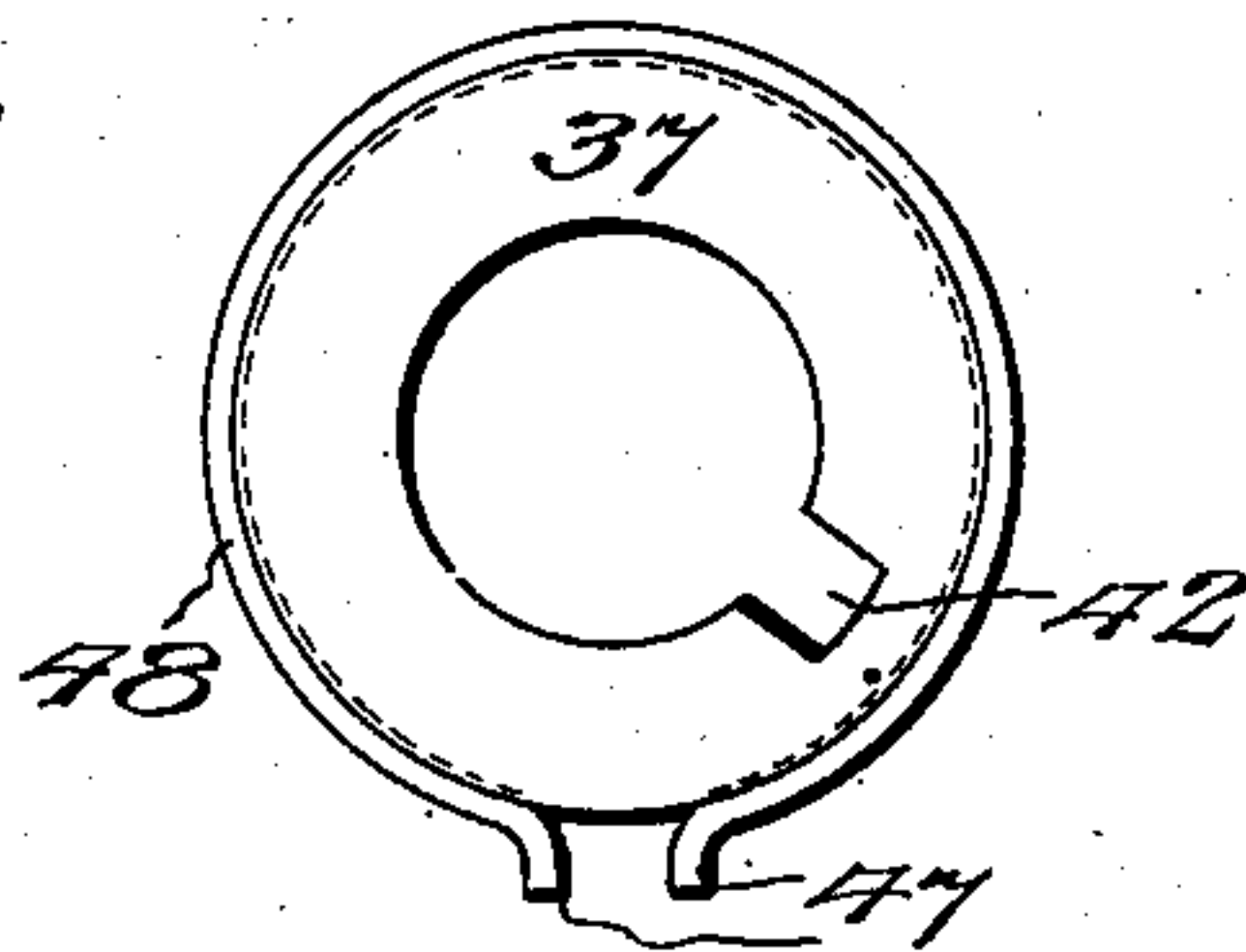
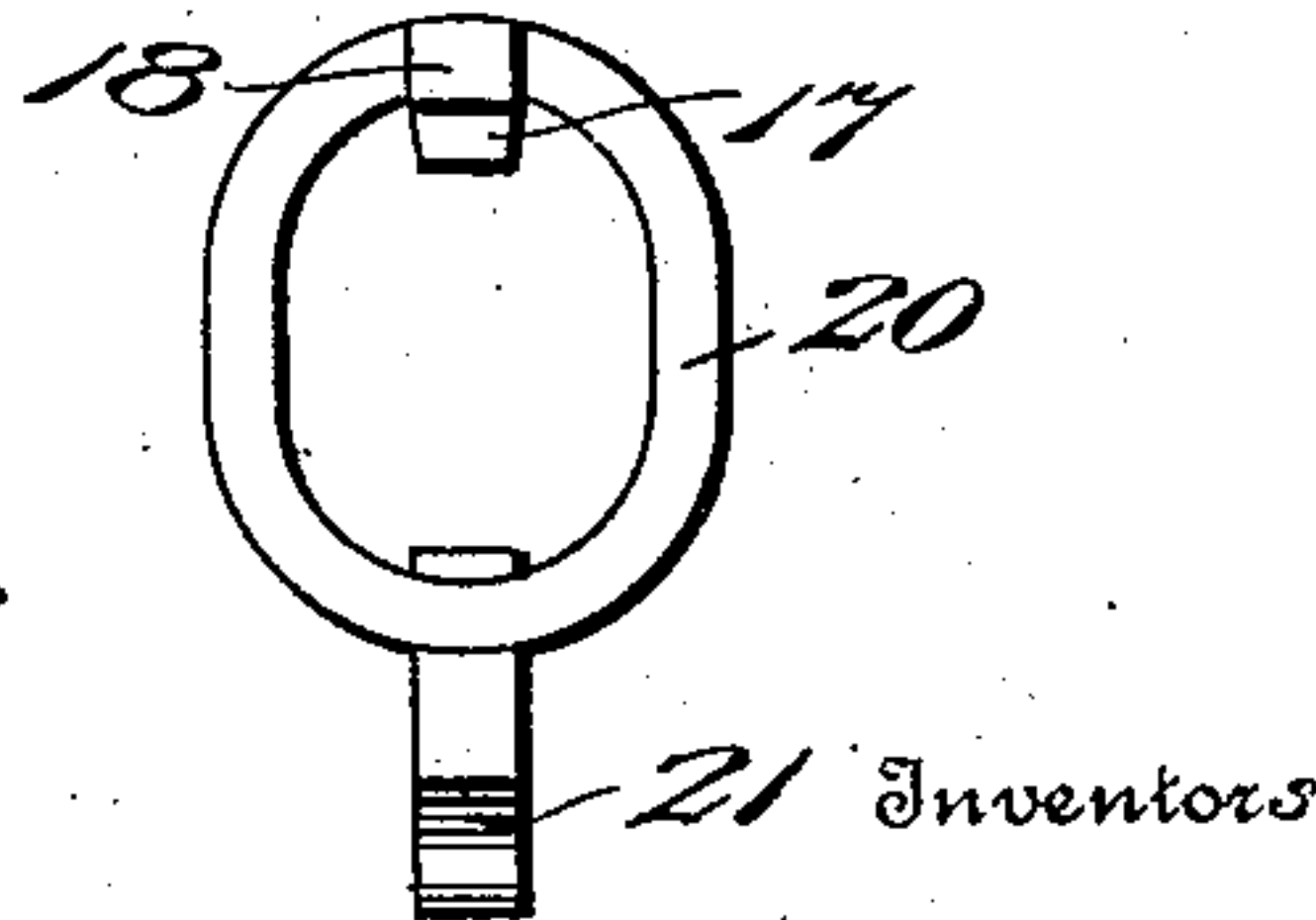


Fig. 11.



Witnesses

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Fig. 12.



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UNITED STATES PATENT OFFICE.

JOSEPH ARNER AND CALVIN ARNER, OF WEISSPORT, PENNSYLVANIA.

COMBINATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 724,774, dated April 7, 1903.

Application filed July 23, 1902. Serial No. 116,732. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH ARNER and CALVIN ARNER, citizens of the United States, residing at Weissport, in the county of Carbon and State of Pennsylvania, have invented certain new and useful Improvements in Combination-Locks, of which the following is a specification.

This invention relates to combination-locks; and the object thereof is to provide an improved mechanism contained within the knob, whereby the knob will be normally disengaged with relation to the spindle, so that the spindle can only be turned from one side when the combination is properly set, so as to lock the knob to the spindle. The opposite side of the spindle, however, will be provided with a rigidly-connected knob, so that the spindle may be readily turned. The invention is particularly designed for the ordinary form of mortise-lock, but can be applied to other forms of locks, as desired.

In order to appreciate the advantages and novel details of construction embodied in this invention, reference should be had to the accompanying drawings, in which—

Figure 1 is a fragmentary perspective view of the portion of a door, showing our invention applied. Fig. 2 is a vertical longitudinal sectional view through the knob mechanism, one of the knobs, the lock-plate, and spindle being shown in elevation. Fig. 3 is a transverse sectional view through the knob on the line 3 3 of Fig. 2. Fig. 4 is a cross-sectional view on the line 4 4 of Fig. 2. Fig. 5 is a similar view on the line 5 5 of Fig. 2. Fig. 6 is a like view on the line 6 6 of Fig. 2. Fig. 7 is a cross-sectional view on the line 7 7 of Fig. 2. Fig. 8 is a detail view of the flanged guard-ring. Fig. 9 is a reverse elevation of the dial-plate. Fig. 10 is a plan view of one of the tumblers. Fig. 11 is a plan view of the sliding plate or yoke, showing the dog and fence attached thereto. Fig. 12 is a detail view of one of the spindle-sleeves, showing a portion of the spindle connected thereto.

The reference-numeral 1 designates a door which is provided with a mortise-lock 2 of any preferred construction. Projecting from the mortise-lock is a spindle 3, on the inner end of which is provided a knob 4, sleeved

thereon and secured by means of a screw 5, which passes transversely through the neck 6 of the knob and impinges against the spindle 3. Fitting around the opening 7 in the door through which the spindle passes is a flanged guard-ring 8, whereby access to the spindle will be prevented. The spindle 3 projects through the other side of the door, which is assumed as being the outside, and carries on its extremity a transverse rib 9, to be referred to hereinafter. A sleeve 10 is secured to the guard-ring 11, which in conjunction with the sleeve prevents an unauthorized manipulation of the spindle by some person or persons who are not familiar with the combination. The sleeve 10 is provided with a central enlarged seat, in which is fitted a second sleeve 12, secured to the spindle and adapted to turn therewith. The outer extremity of the sleeve 10 is provided with a peripheral flange 13, which engages the restricted portion or shoulder 14 of the knob 15, whereby said lock is revolvably secured with relation to the sleeve and spindle. The sleeve 12 is provided at its top with a seat 16, in which a slidable dog or bolt 17 is adapted to be seated, said dog having rearwardly-extending lug or projection 18, which engages a slot 19 in the seat 16, the purpose of which is to lock the knob with relation to the spindle, as will be explained hereinafter. The dog or bolt which forms the locking device is supported by a yoke or ring 20, which fits over the protruding end of the sleeve 12 and carries at its lower extremity a depending portion 21, which projects through the slot 22 in the knob 15, and extending from the lower portion of the ring 20 is a forwardly-projecting horizontally-arranged fence, which terminates at a point adjacent the revoluble dial-plate 23, said dial-plate being provided with a keyhole-shaped groove 24, into which projects the end of the fence, said fence being designed to drop in the vertical portion 25 of the groove when brought in proper alinement therewith and in alinement with the slots in the tumblers, to be referred to hereinafter.

Surrounded by the curved portion of the groove 24 is an integrally-arranged rearwardly-projecting spindle 26, which is provided with an internally-threaded bore 27, in

which the threaded portion 28 of a head-screw 29 fits. The head portion of the screw 29 engages the circular recess formed in the flanged plate 30, which is secured to the rear inner wall of the knob 15 by screws 31. This plate is provided below the spindle with a vertically-arranged slot 32, so that the depending portion of the ring 21 may vertically slide therein, said portion 21 having a forwardly-projecting pin 33, against which a downward pressure is exerted by the free end of the spring 34, which is secured at its opposite end to the plate 30.

Projecting from the concentric opening 35 in the flange-plate 30 is a circular flange 36, which forms a bearing on which the tumblers 37 and 38 are journaled, said tumblers being spaced apart by a washer 39, the tumbler 38 being held away from the dial-plate by a washer 40. The inside of the flange 36 is provided with a notch or recess 41, in which the fence is normally seated, and when the fence is in its seated position the lower edge thereof lies flush with the outer periphery of the flange 36, so that when the tumblers and washers have their slots 42 out of alinement they are free to rotate, the fence not interfering in any way with the free rotation thereof. It will be noticed that each tumbler is provided with a slot 42, which are designed to be brought into alinement with each other and into alinement with the vertical portion 25 of the groove 24, so that the fence 29 can drop into the alined slots and grooves, causing the dog or bolt 18 to be seated in a seat 19, whereby the knob on the remaining mechanism will be rigidly connected or locked to the spindle. It will then be an easy matter to turn the spindle from the outside, so as to retract or project the bolt 43 of the lock 2.

In order to manipulate the combination, we provide on the inner face of the dial-plate 23 a lug or projection 44, which is designed to engage one of the fingers of the peripheral arranged wiring 45, seated in the peripheral groove of the tumbler 38, whereby said tumbler 38 may be rotated to bring its slot 42 in proper alinement. The fingers 46 are provided with lateral extensions 46^a, which may come in contact with the fingers 47 of the spring-ring 48, fitting in the peripheral groove of the tumbler 37, so that the tumbler 37 can also be rotated to bring the notch 42 thereof in alinement with the notch 42 of the tumbler 38 and with the vertical portion 25 of the groove 24. In operating the combination the lug 44 is first engaged with one of the fingers 46 of the spring-ring 45, and the tumbler 38 is rotated until the fingers thereof contact with fingers on the tumbler 37, causing the tumbler 37 to assume a proper position, so that the slot 42 thereof will be immediately alined under the fence 41. The dial-plate is then rotated in the opposite direction until the slot 42 in the tumbler 38 is brought in alinement with the slot in the tumbler 37. The dial-plate is then reversed through the

medium of the knob 49 until the vertical portion 25 of the groove 24 is brought into alinement with the slots in the two tumblers. The fence will then drop into the slots and grooves through gravity, thereby locking the knob to the spindle.

Arranged on the outer fence of the plate 30 are a plurality of characters, preferably numerals, which correspond to the characters on the dial-face, and the object of so arranging these characters is to provide means whereby the combination can be set or changed from the interior of the knob.

By reference to Figs. 1 and 2 it will be noticed that the knob cannot be removed from the spindle from the outside of the door. In order to remove the knob, however, it is necessary to take out the screw 5, and by slipping off the knob 4 from the inner end of the spindle the spindle can be pushed forward, so that the rib 9 will engage the groove in the head of the screw 29, so that by turning the dial-plate it can be removed from the screw and the interior mechanism in the knob taken out, whereby the knob may be removed. In order that the spindle can be pushed longitudinally, we provide a slot 50 in the sleeve 12 to permit the play of the screw 51 therein, said screw being designed to lock the sleeve 12 against turning with relation to the spindle.

By reference to the foregoing description it will be apparent that a device constructed and arranged in accordance with our invention will materially improve the efficiency of locks, and the ordinary sliding bolt to which a key is used may be dispensed with, if desired, as no person can open the door from the outside without being informed as to the combination.

We have described in detail what to us appears to be the very best means of accomplishing the desired results; but we would have it understood that we do not limit ourselves to the exact details of the construction shown, but reserve the right to make such slight changes and alterations as would properly come within the scope of our invention and without departing from the spirit thereof.

Having thus described our invention, what we claim as new is—

1. In a lock the combination with a spindle, a knob thereon through which the spindle projects, a lock mechanism within the knob, a dial-plate adapted to rotate with relation to the knob, a spindle on the dial-plate, means for securing the spindle to the lock mechanism and means on the end of the first-named spindle for engaging the means for locking the dial-plate to the lock mechanism, whereby the dial-plate can be released.

2. In a lock the combination with a spindle, of a knob thereon through which the spindle projects, a dial-plate on the knob, a plate adjacent the dial-plate, and having a concentric opening, a headed screw projecting through the last-named plate and engaging the dial-plate, whereby the dial-plate will be held in

locked relation with the knob, and means on the end of the first-named spindle for engaging the screw whereby the dial-plate can be released.

5 3. In a lock the combination with a knob, a dial-plate thereon, means for securing the dial-plate to the knob, a spindle to which the knob is secured, said spindle being adapted to slide into said knob to engage the means
10 for securing the dial-plate whereby the dial-plate may be removed.

4. In a lock, the combination with a spindle having a rib on one end thereof, a hollow knob secured to the end of the spindle, a rib
15 on the end of the spindle and projecting within the knob, lock mechanism within the knob, the rotating dial-plate of which is provided with a spindle projecting through an opening within the knob, a headed screw secured to
20 the end of the spindle and bearing against the edges of the openings, said screw being provided with a groove and spaced apart from the rib on the first-named spindle, and means for sliding the first-named spindle to bring
25 the rib in contact with the groove in the screw, whereby said screw may be removed.

5. In a lock, the combination with a spindle, a knob loosely mounted thereon, said knob being hollow, a plate within the knob having
30 a concentric opening, a dial-plate adapted to

rotate with relation to the knob, a spindle thereon projecting through said opening, a screw on the end of the spindle and provided with a head bearing against the openings in the plate, and means on the end of the first- 35 named spindle for engaging the screw whereby said screw may be removed.

6. In a lock, the combination with a hollow knob and a spindle on which it is secured, a sleeve on the end of the spindle and project- 40 ing through the knob, a peripheral flange on the sleeve provided with a recess or seat, a gravity-slide, a dog thereon designed to enter the seat of the sleeve, a laterally-projecting fence on the end of the slide, tumblers with- 45 in the knob provided with alining slots, a rotating dial-plate provided with a groove therein adapted to aline with the slots in the tumblers, said groove and slots being designed to aline with the fence whereby it may enter the 50 same and throw the dog in a locking engagement with the seat in the sleeve.

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH ARNER.
CALVIN ARNER.

Witnesses:

T. A. SNYDER,
RAYMOND J. SNYDER.