

No. 661,203.

Patented Nov. 6, 1900.

C. E. & J. ARNER.

DOOR LOCK.

(Application filed Jan. 30, 1900.)

(No Model.)

3 Sheets—Sheet 1.

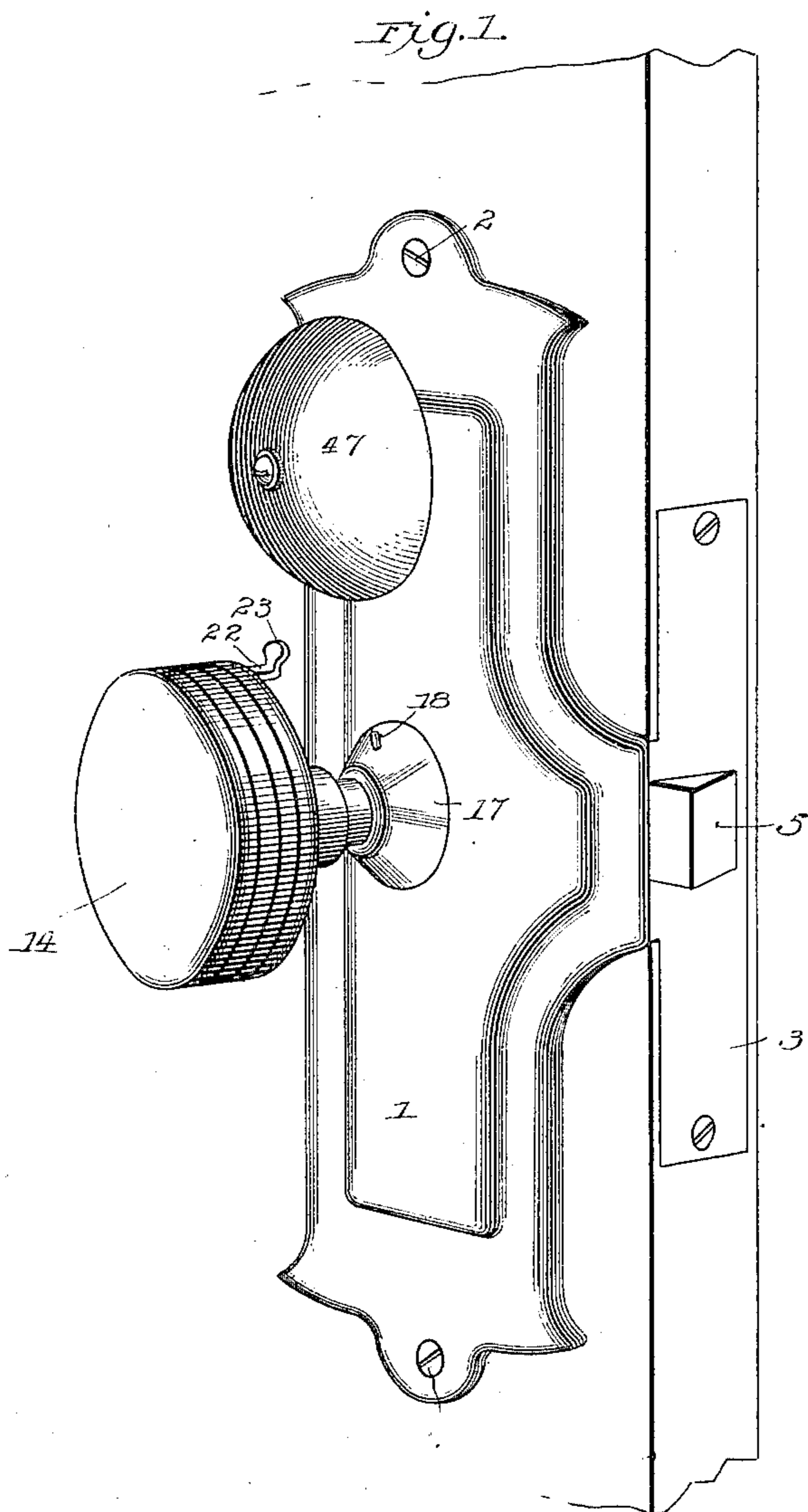
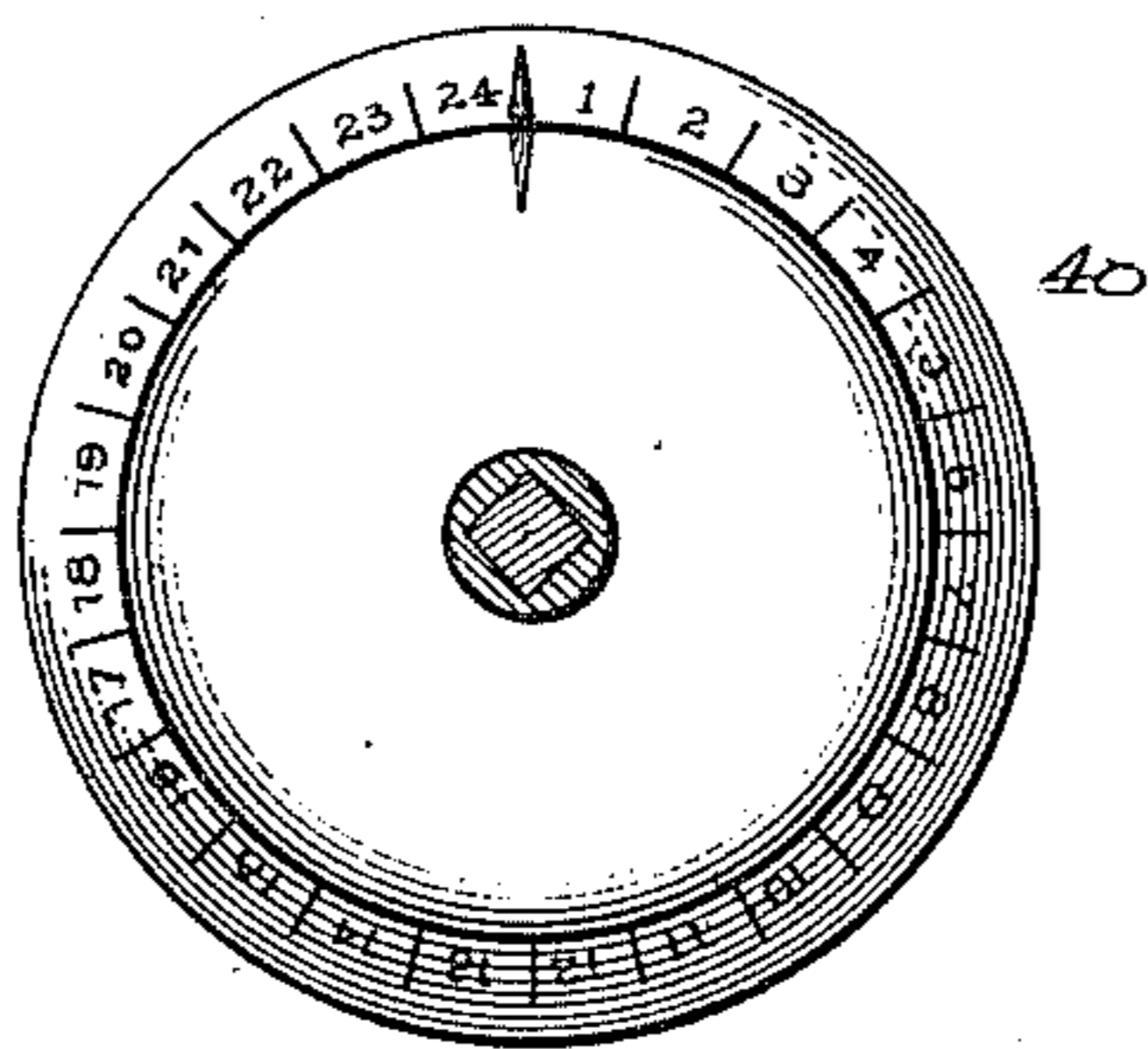


Fig. 13.



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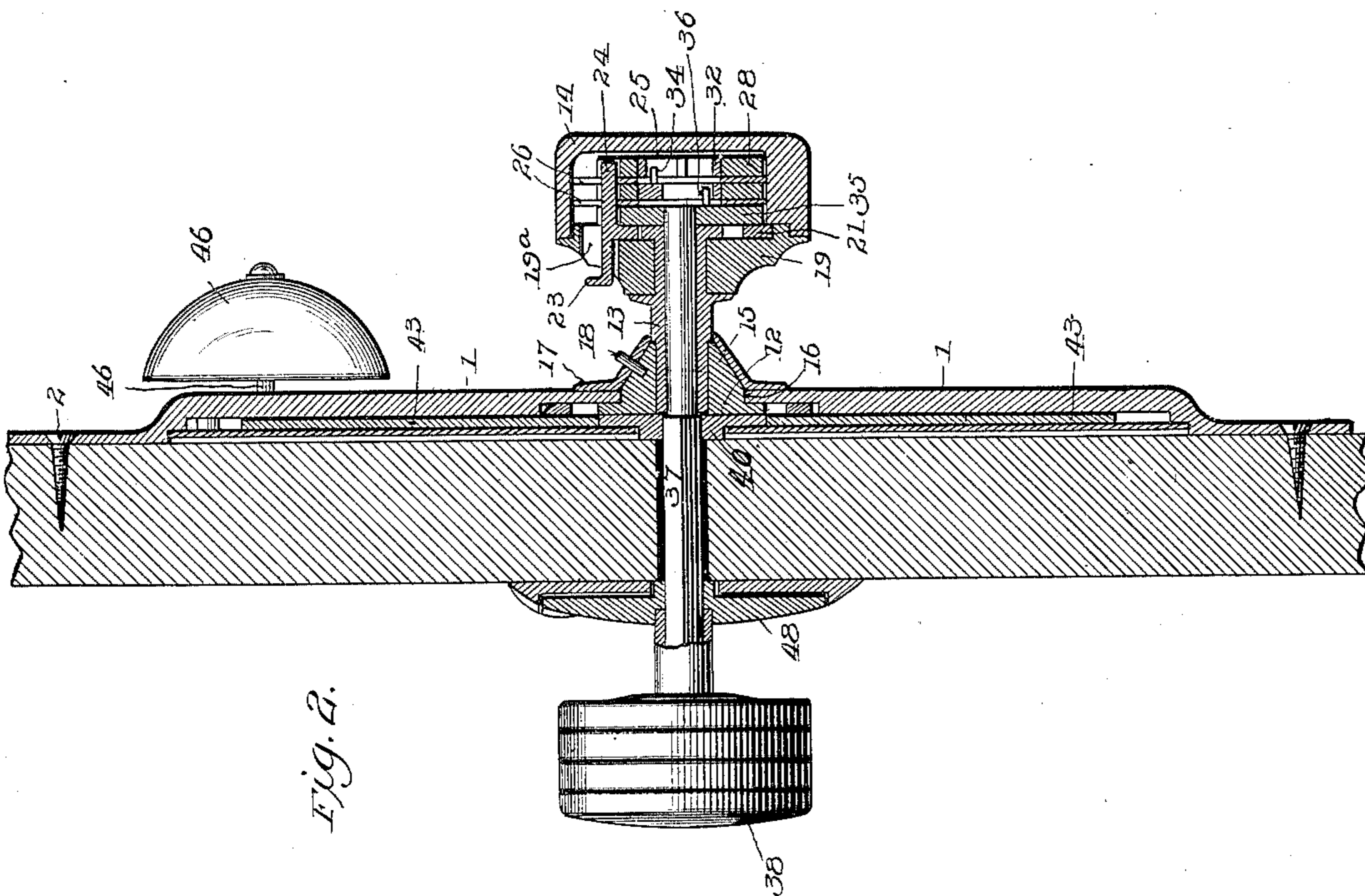


Fig. 2.

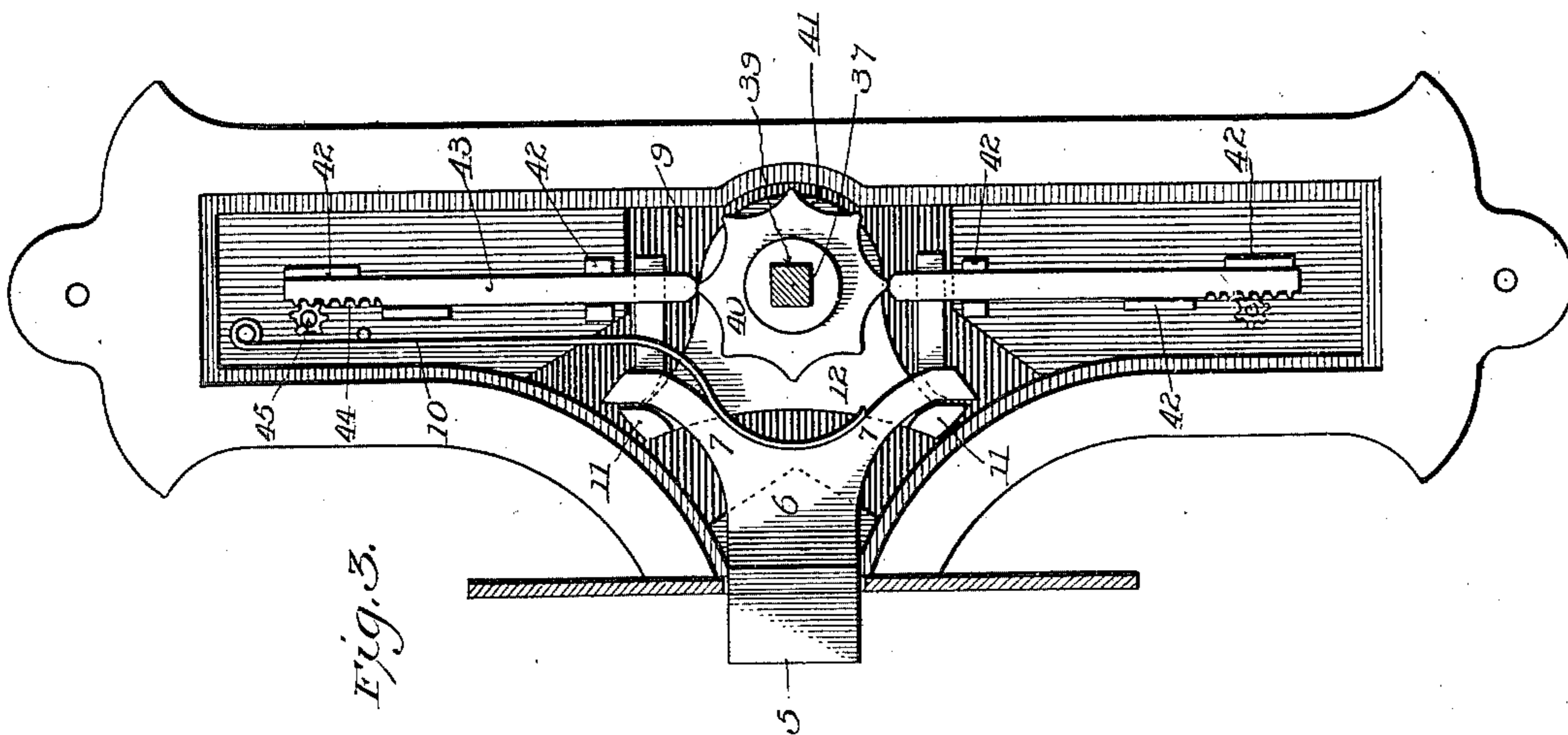


Fig. 3.

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3 Sheets—Sheet 3.

Fig. 4.

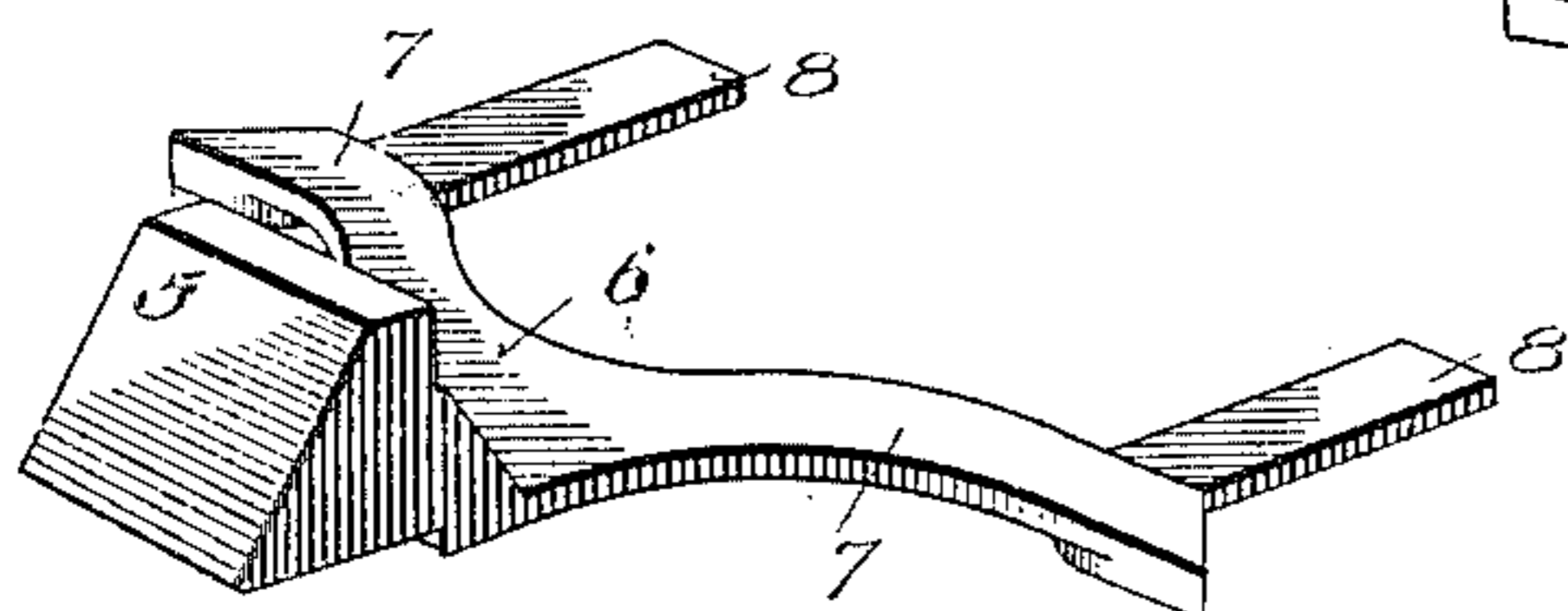


Fig. 5.

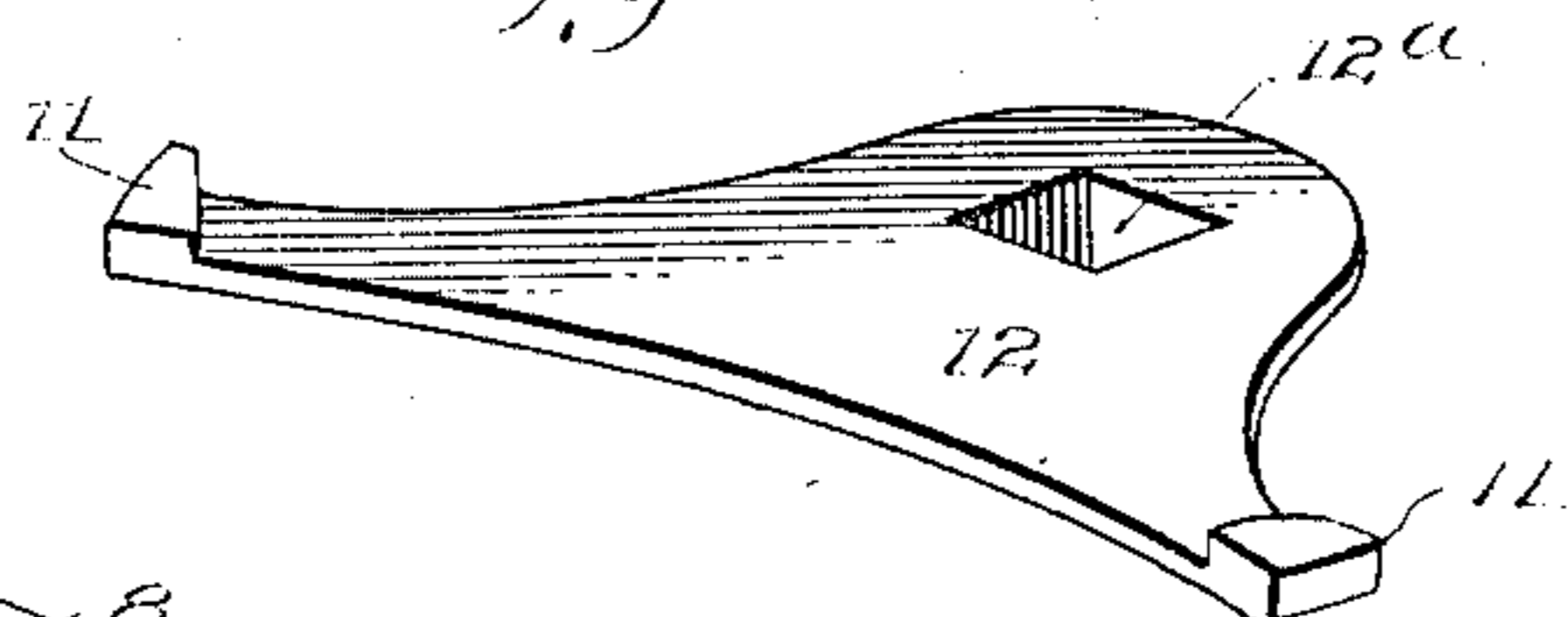


Fig. 6.

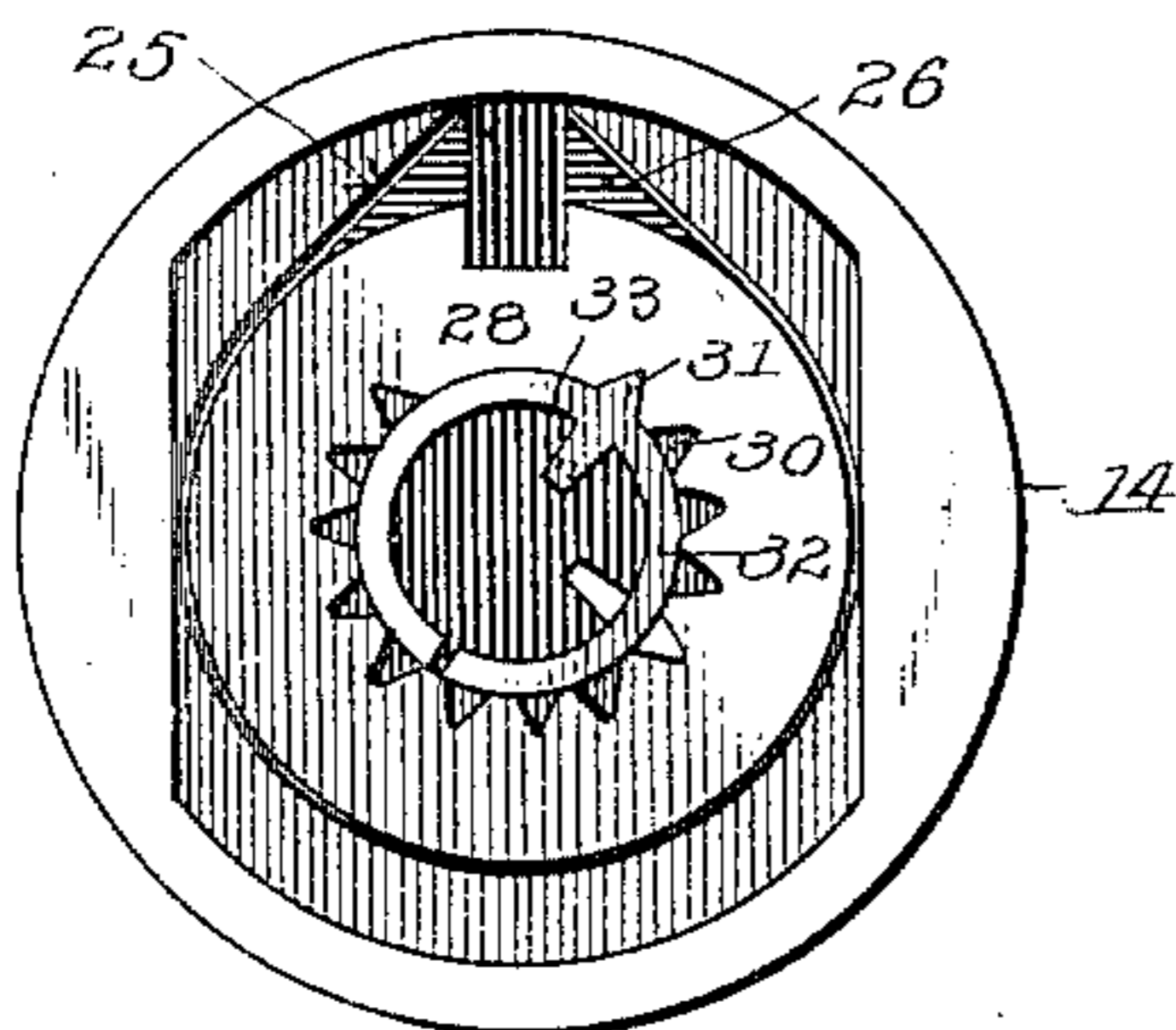


Fig. 7.

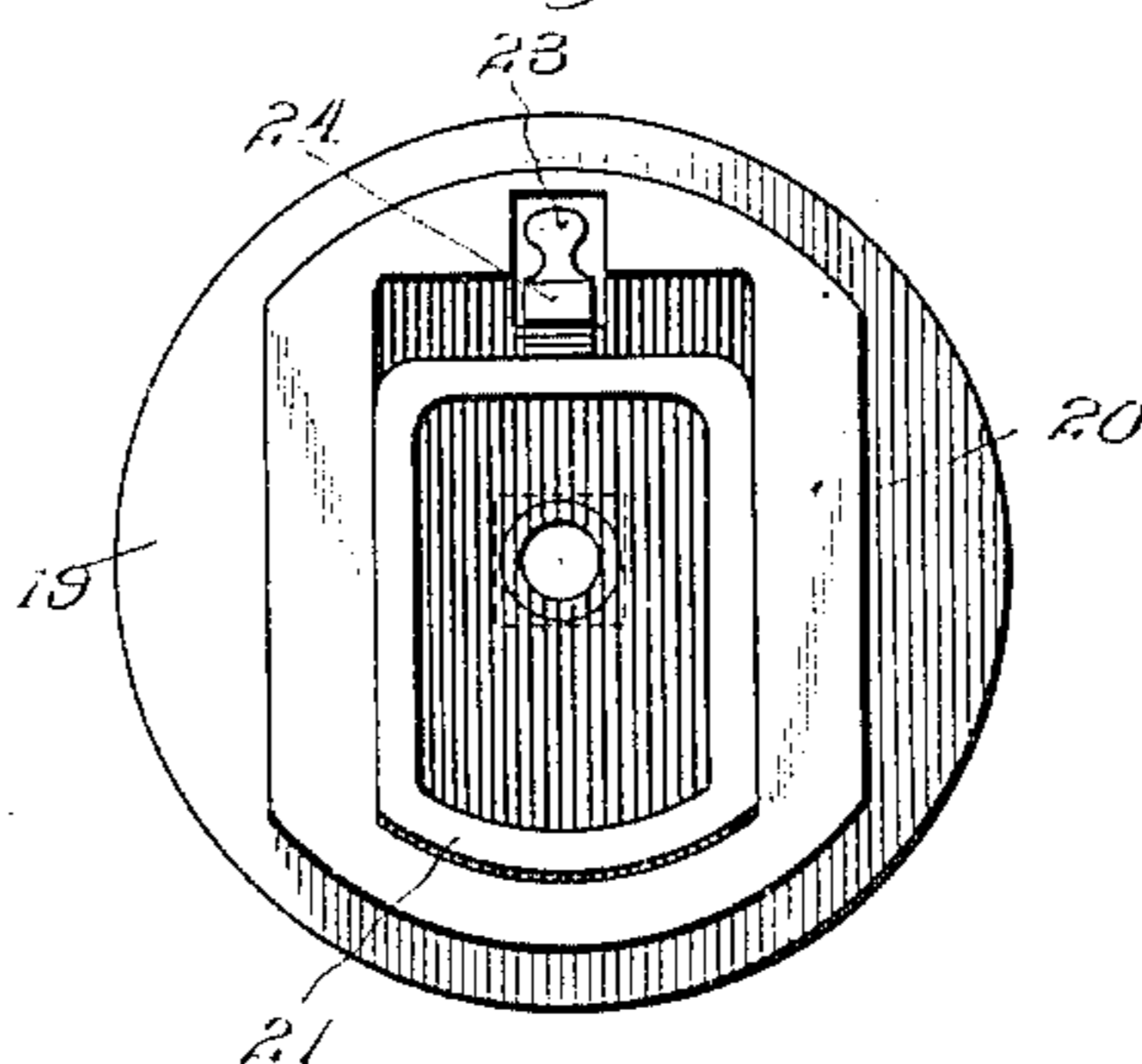


Fig. 8.

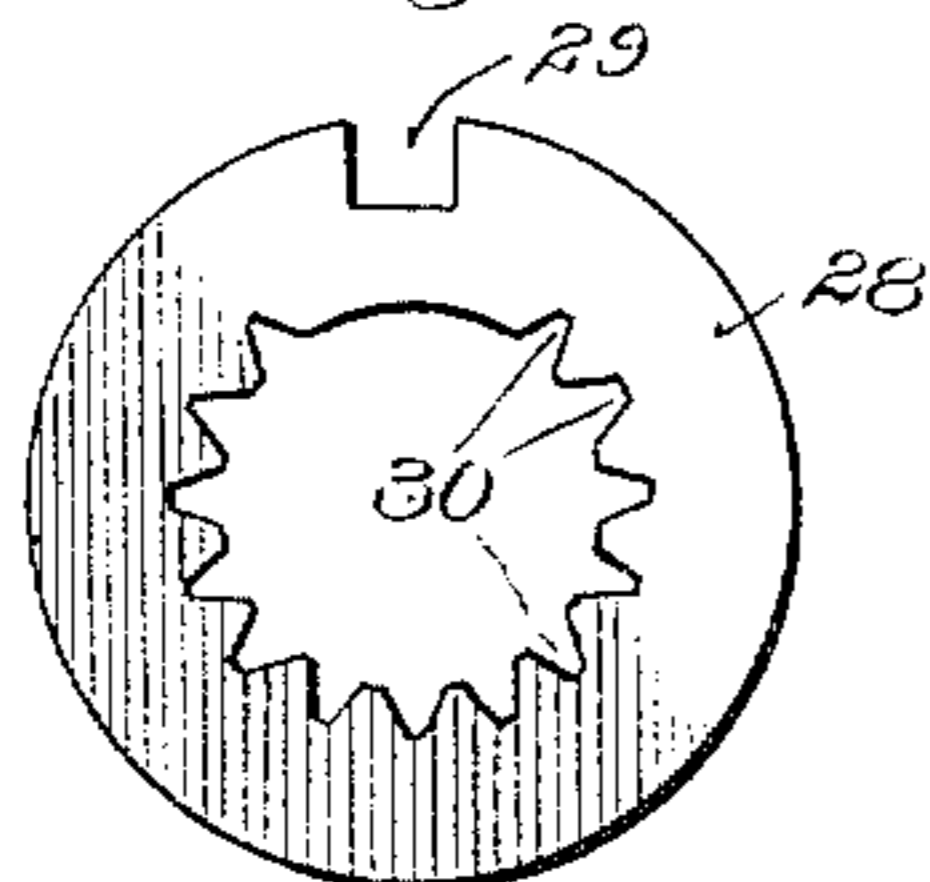


Fig. 9.

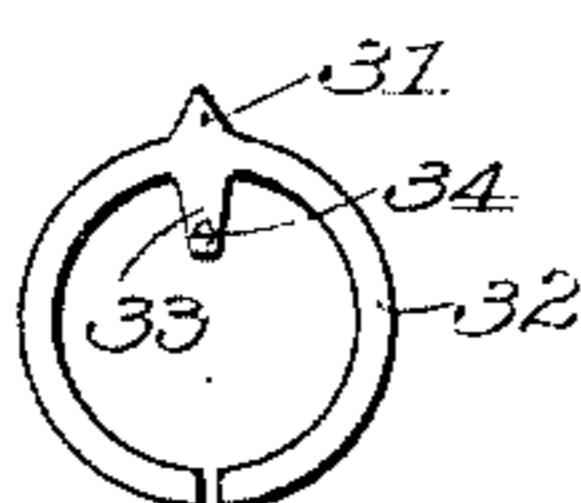


Fig. 10.

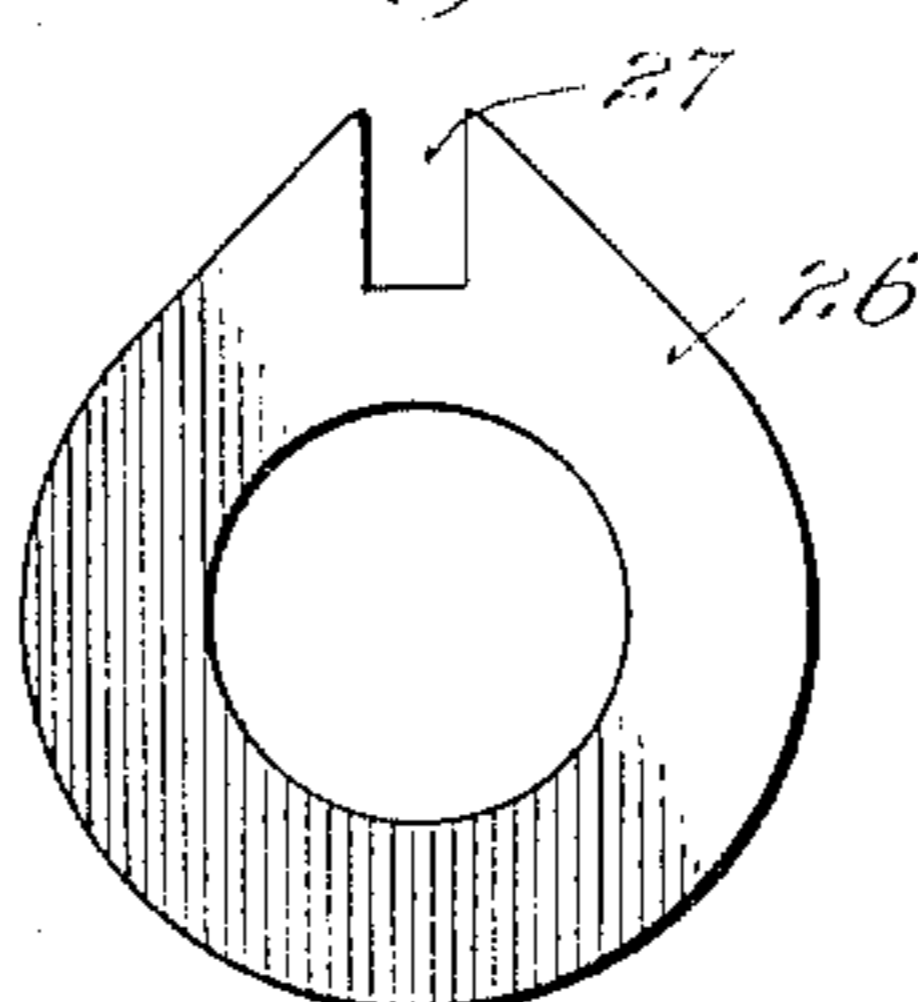


Fig. 11.

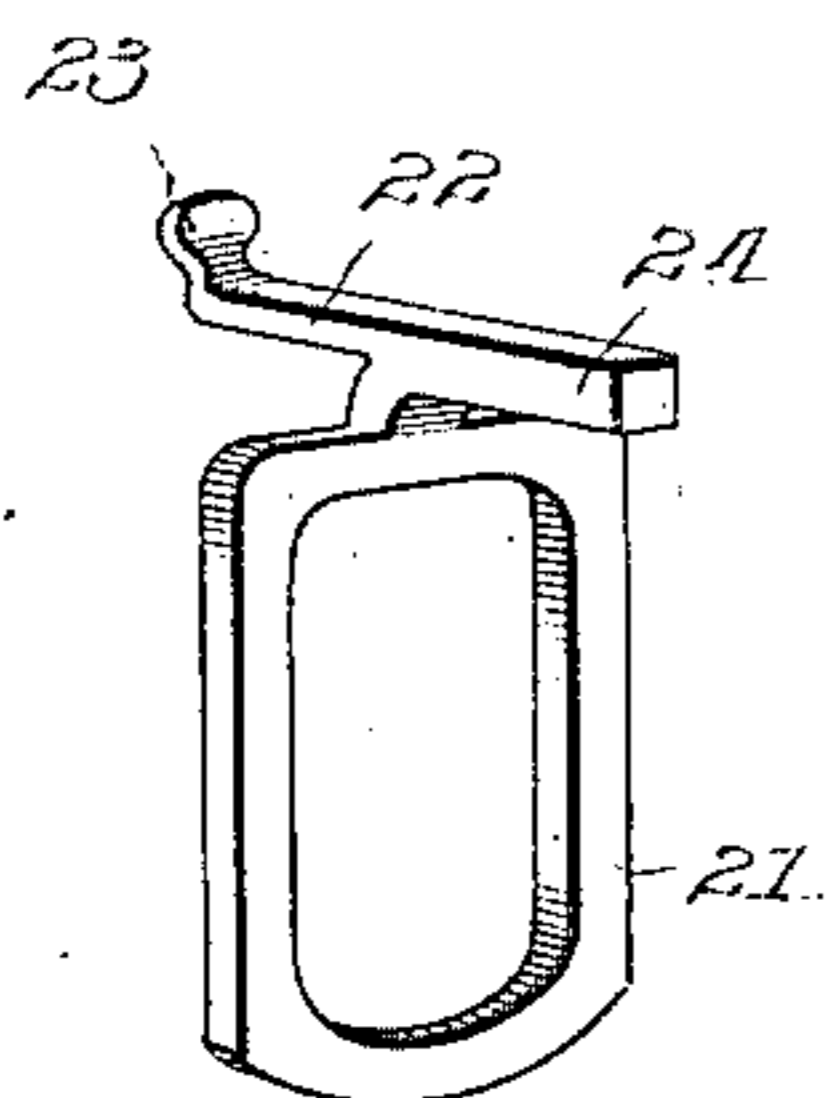
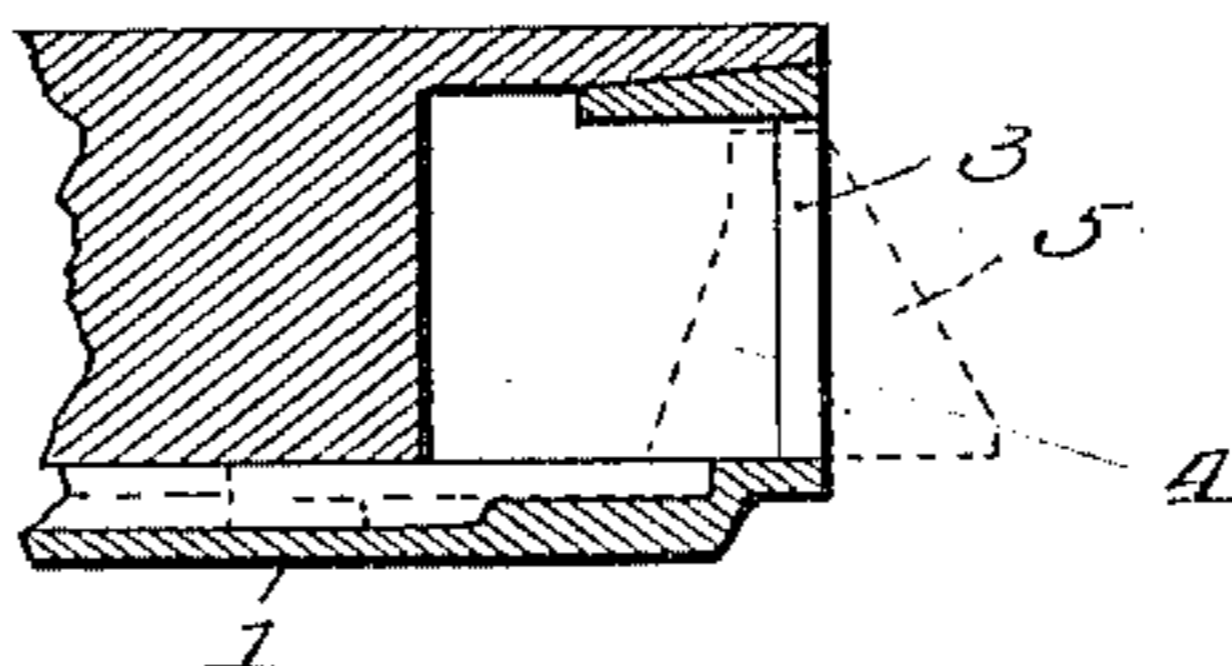


Fig. 12.



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UNITED STATES PATENT OFFICE.

CALVIN E. ARNER AND JOSEPH ARNER, OF WEISSPORT, PENNSYLVANIA,
ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO THE KEYLESS
LOCK COMPANY, OF LEHIGHTON, PENNSYLVANIA.

DOOR-LOCK.

SPECIFICATION forming part of Letters Patent No. 661,203, dated November 6, 1900.

Application filed January 30, 1900. Serial No. 3,338. (No model.)

To all whom it may concern:

Be it known that we, CALVIN E. ARNER and JOSEPH 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 Door-Locks, of which the following is a specification.

This invention relates to new and useful improvements in door-locks; and its object, among other things, is to provide a permutation-lock of simple, durable, and neat construction which may be readily and securely fastened or applied to a door without necessitating the cutting or boring off thereof, but which will nevertheless have all the appearances of a mortise-lock and which may be applied to a door of any desired thickness and to drawers, chests, and the like.

Further objects are to provide a permutation-lock which may be readily operated by turning the inner knob, but which cannot be opened from without without turning the outer knob to a certain combination, and to construct a bell which will sound an alarm when the outer knob is turned.

A further object is to provide tumblers having pins adapted to be readily adjusted for any desired combination.

To these ends our invention consists in the novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, showing the preferred form of our invention, and in which—

Figure 1 is a perspective view of the lock applied to a door. Fig. 2 is a central vertical section therethrough. Fig. 3 is an inner elevation of the lock, showing the spindle in section. Fig. 4 is a perspective view of the latch or bolt. Fig. 5 is a similar view of the retractor-plate. Fig. 6 is an end view of the tumblers within the knob. Fig. 7 is an elevation of the tumbler-lock and its guide. Fig. 8 is a detail view of a tumbler. Fig. 9 is a similar view of its adjusting-ring. Fig. 10 is a similar view of a washer. Fig. 11 is a perspective view of the tumbler-lock. Fig. 12 is a section through a portion of a door with the lock-casing applied thereto and showing in dotted lines the normal position of the sliding

bolt, and Fig. 13 is an elevation of the indicator or dial.

Referring to said figures by numerals of reference, 1 is the casing of the lock and may be formed of any suitable material, as steel, stamped or struck up from a single piece of metal. This casing is adapted to be secured to the inner face of the door by means of screws, as 2, or in other suitable manner, and is provided at one edge with a plate-like portion 3, formed at right angles thereto and secured to the edge of the door, as shown in Fig. 1. This plate 3 is provided with a passage 4, adapted to receive and guide a sliding bolt 5, preferably substantially triangular in section, as shown in dotted lines, Fig. 12, and formed on the end of a plate 6, having oppositely-extending curved arms 7, provided with parallel extensions 8, which slide within and are guided by a recess 9, formed within the inner face of the casing 1. A bow-spring 10 is secured within the casing and bears against the plate 6 at a point between the arms 7, holding said arms normally in contact with shoulders 11, formed on a retractor-plate 12, which is provided with a rectangular passage 12^a therein, adapted to receive the rectangular end of a hollow stem 13 of an inner door-knob 14.

The retractor-plate 12 is preferably provided with a lateral extension 15, adjacent to the passage 12^a and bearing within a circular opening 16, formed within the casing 1. This extension is covered by means of a cap 17, suitably secured to the casing, and may be provided with a key or other suitable device 18, adapted to lock said retractor-plate 12 against rotation.

Secured to the outer end of the stem 13 in any suitable manner is a disk 19, adapted to form one end of the knob 14. This disk is provided on its inner face with a guide 20, within which is mounted a hollow rectangular slide 21, on the upper end of which are formed oppositely-extending horizontal arms, one of which, 22, projects through a passage 19^a within the disk 19 and terminates in a thumb-piece 23, while the other, 24, extends into the recess 25, formed in the knob 14, said recess being preferably substantially egg-shaped in cross-section. Two or more plates

or washers 26, which are similar in form to the recess 25, are arranged transversely therein, fitting snugly and incapable of rotating. These washers are each provided with a notch 5 27, in alinement with the passage 19^a, and between each two washers is arranged a circular ring-like tumbler 28, likewise provided with a notch 29, adapted to register with the notches of the washers. The inner edge of 10 each tumbler is notched, as at 30, one of said notches being adapted to receive a projection 31, formed on a ring 32, which is to be sprung into the tumbler between the inner edges thereof. An inner projection 33 is also formed 15 on this ring, and this projection is provided with a laterally-extending pin 34. These pins are adapted to engage with the projections 33 of the adjacent tumblers, causing them to turn therewith. It is obvious that when motion is imparted to one of the tumblers the 20 notches 29 thereof will through proper manipulation be brought into alinement with the passage 19^a and notches 27 of the washers 26, permitting the arm or dog 24 to fall therein, thereby locking them together. 25

Bearing against the guide 20 is a disk 35, provided with a pin 36, adapted to engage with the projection 33 of the adjacent tumbler. This disk is notched in its outer edge 30 to correspond with the tumblers and is adapted to be locked thereto by the dog 24 when all of the notches are in alinement. Secured to this disk is the end of a spindle 37, which passes through the stem 13 and the door to 35 which the lock is secured, a knob 38 being secured to the opposite end. That portion of the spindle which is outside of the stem 13 is preferably square in cross-section and is adapted to be received by a square passage 40 39, formed in a wheel 40, mounted within the casing 1 and provided in its edge with recesses or concavities 41, as shown.

Slidably mounted within the casing and properly guided by lugs 42 is a rack 43, one 45 end of which bears upon the edge of the wheel 40, while the teeth 44, formed near the opposite end, are adapted to engage with a cog 45, secured to one end of a shaft 46, revolvably mounted within the casing and provided with suitable clappers for striking a 50 bell 47, secured to the said casing. It will be seen that this rack will be held in contact with the wheel 40 at all times by force of gravity. If desired, two racks and cogs may 55 be placed within the casing, as shown in Fig. 3, thereby permitting the lock to be inverted without destroying the efficiency of the alarm. A dial or disk 48 is secured to the outer face of the door and about the spindle 37, and this 60 may be provided with suitable numerals or letters, &c. A pointer (not shown) is secured to the spindle and adapted to turn therewith.

In operation by simply turning the knob 14 in either direction the retractor-plate 12 65 will bear back upon one of the arms 7 of the bolt and retract the same. When pressure is removed, the spring 10 will return it to its nor-

mal position. When it is desired to open the door from the outside, it is necessary to turn the knob 38 back and forth until the pointer 70 thereof has been turned to the proper combination. This backward-and-forward movement of the spindle will turn the disk 35 and the tumblers 27 until their notches are in alinement with passage 19^a. The dog 24 will 75 then immediately fall into the notches and lock the tumblers and the disk to the washers 26, secured within the knob 14, causing said knob to revolve therewith and turn the retractor-plate 12, which will withdraw the 80 bolt, as is obvious. While the knob 38 is being turned back and forth the rack 43 is moved up and down by the revolution of wheel 40, causing the cog 45 to revolve, and thereby sounding an alarm. It will be understood 85 that the combination may be readily changed by removing one or more of the rings 32 and replacing the projections 31 in different notches 30 of the tumblers. By raising the 90 dog 24 by means of thumb-piece 23 and turning the knob slightly the door will become locked and cannot be opened from without unless the knob 38 is again turned to the proper combination.

In the foregoing description we have shown 95 the preferred form of our invention; but we do not limit ourselves thereto, as we are aware that modifications may be made therein without departing from the spirit or sacrificing the advantages thereof, and we therefore reserve 100 the right to make such changes as fairly fall within the scope of our invention.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is— 105

1. In a lock the combination with a spindle, of a tumbler secured to one end thereof, a second tumbler engaging therewith, a washer between the tumblers and secured to a knob inclosing the same, and means for locking 110 said tumblers and washer together.

2. In a lock the combination with a spindle, of a notched tumbler secured thereto, a second tumbler engaging therewith and provided with a similar notch, a notched washer between the tumblers and secured to a knob inclosing the same, and a vertically-movable dog adapted to engage with said notches when brought into alinement. 115

3. In a lock the combination with the casing, of a spindle therein, a toothed wheel secured thereto, a gravity-seated slide contacting at its end with the periphery of said wheel, an alarm, and means for sounding said alarm from the slide. 120 125

4. In a lock the combination with the spindle; of a stem loosely mounted thereon; a retractor-plate secured to the stem; a sliding plate having arms adapted to be engaged and retracted by said plate; tumblers; and a dog, 130 said bolt adapted to be operated by the spindle and retractor-plate upon turning the same in either direction to predetermined points.

5. In a bolt the combination with the spin-

dle, of a stem loosely mounted thereon, a retractor-plate secured to the stem, shoulders thereon for engagement with arms of a sliding bolt, a tumbler secured to the spindle, a knob secured to the stem and having a washer fixed therein, and a dog for locking said tumbler and washer together.

6. A lock comprising a casing, a spindle, a toothed wheel secured thereto, a sliding rack contacting with the periphery of the wheel and adapted to engage with a cog for operating an alarm, a tumbler secured to the end of the spindle, a stem loosely mounted on the spindle, a knob secured thereto and having a washer fixed therein, a dog for locking said tumbler and washer together, a retractor-plate secured to the stem, a sliding

bolt having arms adapted to be engaged by said plate, and a spring for holding said bolt normally projected.

7. In a lock, a tumbler comprising an outer ring, notched in its inner edge, an inner contractible ring provided, at a point between its ends, with an outer extension for engagement with one of said notches, an inner extension and a laterally-extending pin thereon.

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

CALVIN E. ARNER.
JOSEPH ARNER.

Witnesses:

STANLEY GILHAM,
S. R. GILHAM.