

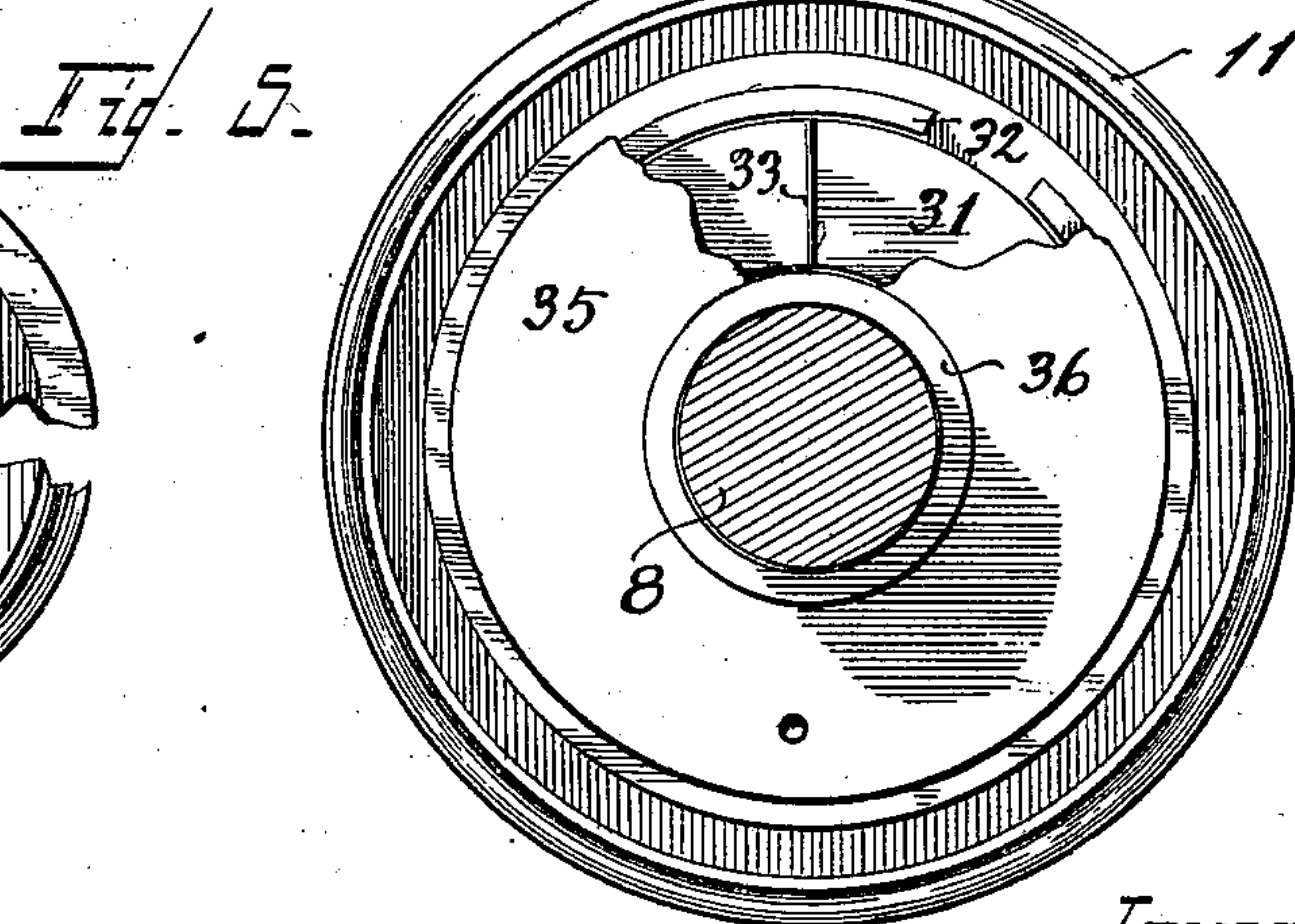
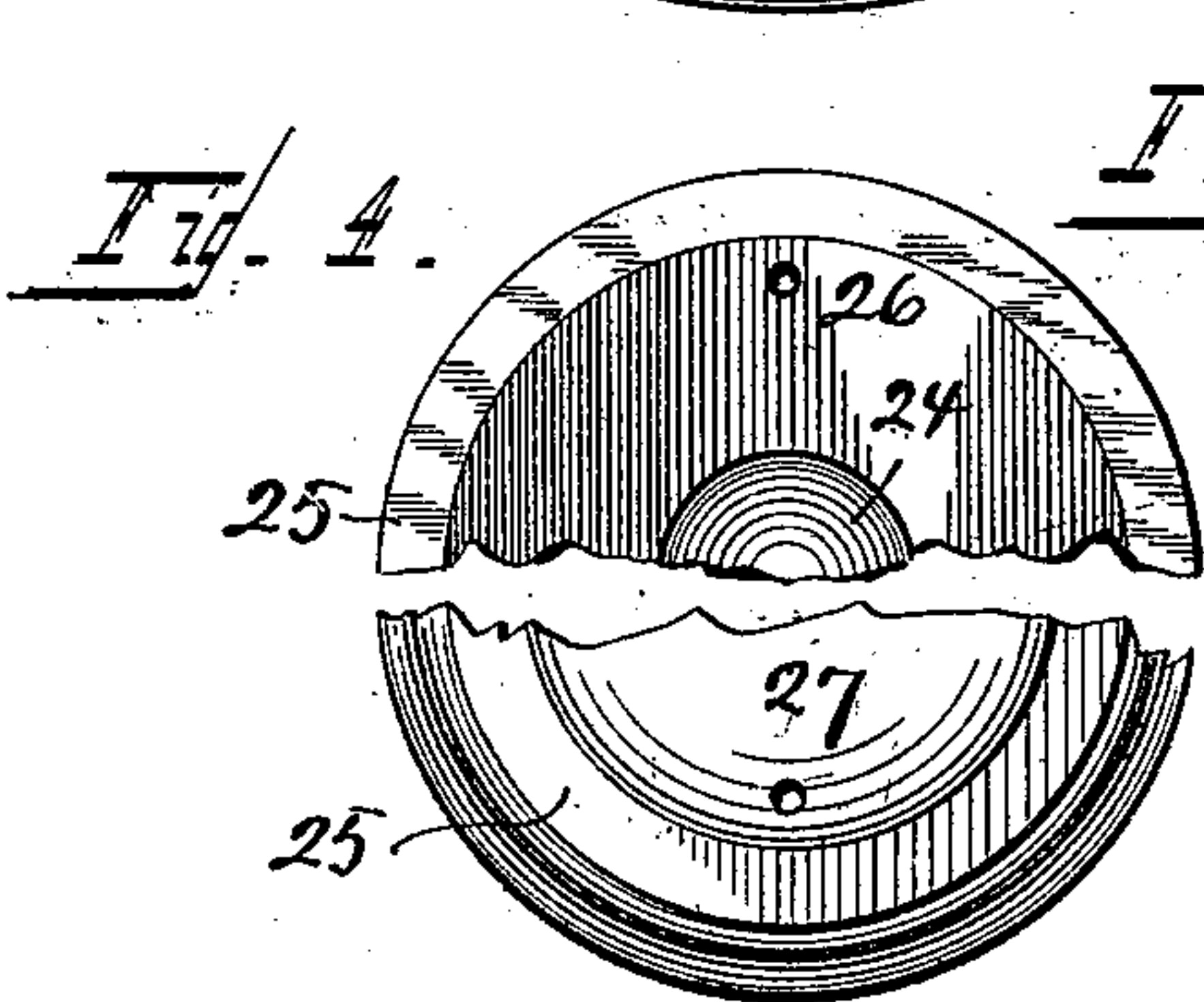
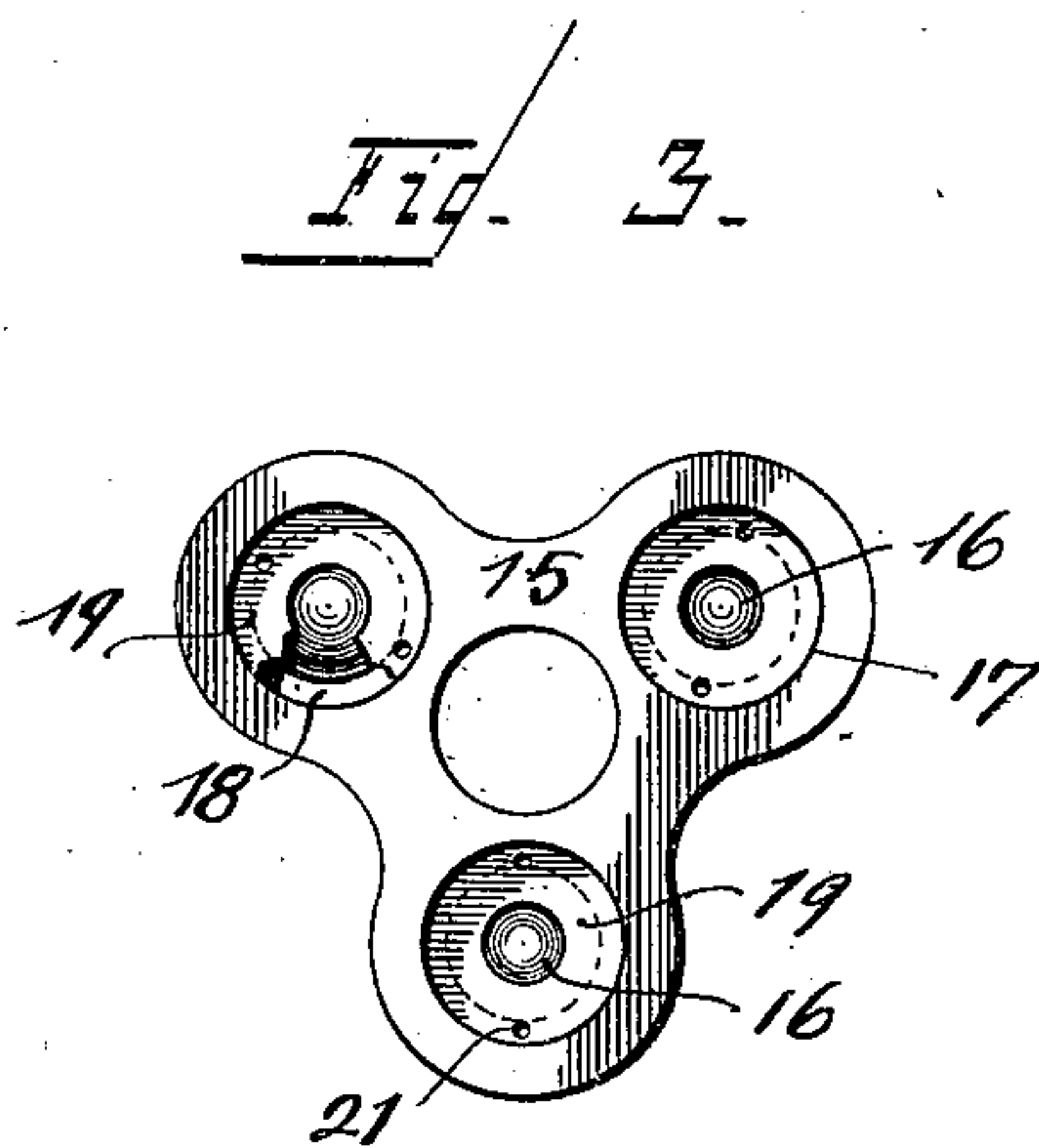
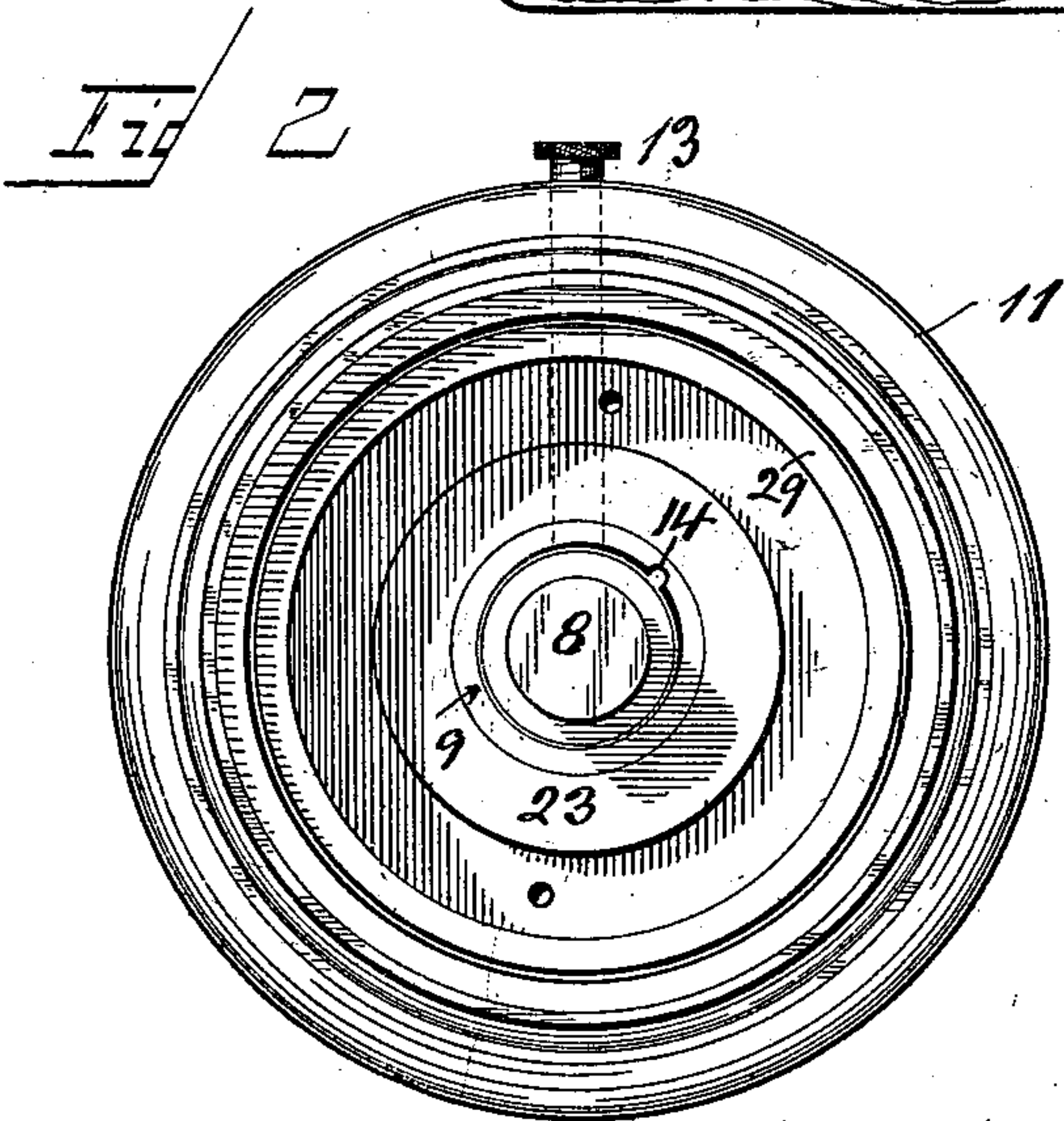
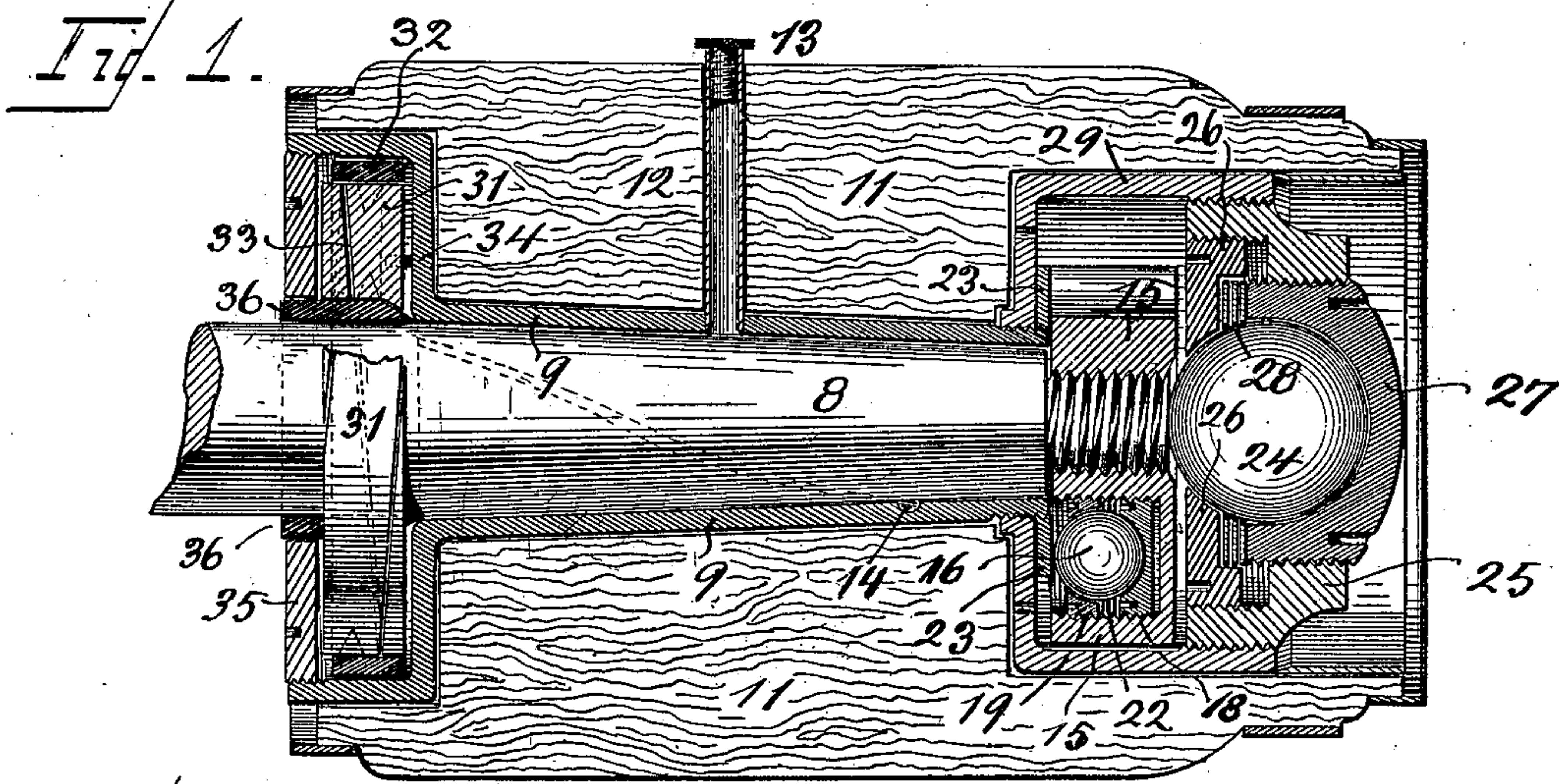
No. 652,819.

Patented July 3, 1900.

A. J. THEIRING.
ROLLER BEARING.

(Application filed Jan. 27, 1900.)

(No Model.)



Witnesses:
Arthur Kline
Bradford B. Gregory

Inventor
Andrew J. Theiring
by C. Spengel atty.

UNITED STATES PATENT OFFICE.

ANDREW J. THEIRING, OF CINCINNATI, OHIO.

ROLLER-BEARING.

SPECIFICATION forming part of Letters Patent No. 652,819, dated July 3, 1900.

Application filed January 27, 1900. Serial No. 3,004. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. THEIRING, a citizen of the United States, and a resident of Cincinnati, Hamilton county, State of Ohio, have invented a certain new and useful Hub and Axle-Bearing; and I do declare that the following is a description thereof sufficiently clear, full, and exact to enable others skilled in the art to which it appertains to make and use the same, attention being called to the accompanying drawings, with the reference-numerals marked thereon, which form also a part of this specification.

This invention relates to improvements in hubs and axle-bearings; and it consists of certain new and improved means, as hereinafter described, whereby a hub is held in position on an axle, the object and corresponding construction of these means being such as to obviate and reduce as much as possible the friction between rotating and stationary parts—that is, in particular between those parts and surfaces of the hub which engage endwise and come in contact with opposite surfaces and which hold the hub in position.

Subsidiary features of my invention relate to details of construction in general and of the means whereby the axle-bearing is rendered dust-proof.

In the following specification, and particularly pointed out in the claims, is found a full description of the invention, together with its operation, parts, and construction; which latter is also illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal section of a hub mounted upon an axle-journal and showing a bearing constructed in a manner as contemplated by my invention. Fig. 2 shows an end view of the hub with such parts which confine it in position on the axle-journal removed. Fig. 3 shows the disconnected ball-bearing nut which holds the hub in position on the axle-journal. Fig. 4 shows the removed outer ball-bearing socket and dust-cap combined, one half of the figure showing same as it appears on the outside of the hub, the other as it appears inside; and Fig. 5 is a rear view of the hub and axle-bearing, the axle being shown in section and parts of the hub broken away.

In the drawings, 8 indicates the axle-jour-

nal, which may be straight or tapering, as shown. 9 is the sleeve or box of the wooden hub 11, of which it forms a component part and is shaped and sized to fit the aforesaid journal. In an all-metal hub this box would of course not be required. Lubricant is admitted to the contacting bearing-surfaces of hub and axle-journal through a duct 12, closed by a screw-plug 13, and distributed throughout the bearing by means of a spirally-disposed groove 14, cut into the bore of the sleeve. This latter is held on the axle-journal by means of a stationary nut 15, mounted on the outer threaded end of the axle and occupying a recess in the outer end of the hub, which recess is obtained by enlarging the bore of the latter thereat. To reduce the friction between the stationary surfaces of this nut which engage the moving surfaces opposite it within the recess at the outer end of the hub, I interpose balls 16 thereat, which by preference are carried by this nut and on that side thereof which is opposite the end of the hub. As to number these balls are so limited that they do not touch each other, for which purpose each is contained in a separate socket 17 provided for it. To hold these balls in their respective positions on nut 15 and to permit also of adjusting and renewing the surface of the nut against which these balls wear, they are inclosed and held each within a bearing contained in this nut and consisting of two separable shells or sections—an inner one, 18, and an outer one, 19—both held within sockets 17 of the nut by means of a screw connection, so as to form removable bearings or holders for these balls. For such purpose they are provided with means, like socket-holes 21, to receive a requisite tool or spanner-wrench. Packing 22 may be interposed between these two sections. The outer or top section 19 has an opening through which a part of the inclosed ball projects for the purpose of permitting it to engage and bear against the opposite surface on the hub. This surface is represented by a flat ring 23, on and around which these balls travel, and which ring is preferably removably secured to the sleeve of the hub in order to permit its independent renewal in case of wear, thereby obviating replacement of an entire hub. This ring is so attached, preferably by means of a

screw connection, to the end of the sleeve. The hub as to position is confined in the other direction—that is, the one in which it would crowd inwardly upon the axle-journal—
 5 by means of an abutment preferably combined with a ball-bearing which engages the outer end of the axle and is carried by the hub, within the recess at the outer end thereof. This ball-bearing comprises, preferably, only
 10 one ball, as shown at 24, and is carried in a socket member 25, by which it is held within the recessed front end of the hub. This ball-bearing consists of a perforated nut 26 and
 15 a cap 27, between which ball 24 is supported, both being removably secured to socket 25 by means of a screw connection to permit independent renewal of these parts, as well as adjustment, as they wear and to maintain the proper relation between ball 24 and the end
 20 of the axle. Packing 28 may be interposed between these parts confining the ball.

Wear of the outer end of the axle-journal may be prevented and renewal of the worn parts provided for by interposing a screw,
 25 which may be attached to the end of the axle-bearing and against the head of which ball 24 bears. Socket member 25, with this ball-bearing, as a whole is removably, as well as adjustably, secured within the outer open end
 30 of the hub by means of a screw connection. Openings to permit application of a spanner-wrench are provided on all these parts. Unless the hub should be all metal it becomes
 35 necessary to provide a metal lining 29 for the recesses at the end of the hub, which by preference forms a part of or is connected to the end of box 9, and thus in a wooden hub serves to hold this latter in place. The outer parts
 40 of this ball-bearing, closing, as they do, the otherwise open recess in the front end of the hub, serve thus at the same time as a dust-cap, excluding dirt and dust from the axle-bearing and preventing escape of the lubricant. The same objects are accomplished at
 45 the inner end of the axle-bearing by suitable means—as, for instance, by a packing-ring 31, which may be of rubber, and is held in tight contact with the axle by an open ring 32, encircling the same and having a tendency to
 50 contract, thereby crowding the packing constantly toward the bearing-surface. To permit the packing to contract and follow this action, it is split by means of a suitable cut. For such purpose it may be cut, as shown at
 55 33, on an inclined plane which starts on one side of it and passing entirely around it extends also through its entire thickness and comes out on the other side thereof at a point diametrically opposite from the starting-
 60 point. This split permits the packing to yield to the contracting action of ring 36 and to constantly close up around the axle as it is reduced by wear. To prevent it from rotating or slipping independently, I provide a
 65 pin 34 in the end of the hub, which engages a groove in the washer and which holds the

same in one position without interfering with its contraction. The whole is contained within a recess formed in the rear or inner end of the hub similar to the recess in the front and
 70 closed by a nut 35.

The edges around the extreme outer and inner ends of the hub, if this latter is of wood, are protected by customary hub-bands, as shown. 75

Having described my invention, I claim as new—

1. The combination in a hub and axle-bearing of means whereby the hub is endwise confined on the axle against movement in either
 80 direction, balls interposed between these means and the opposite surfaces at the end of the hub and holders whereby each one of these balls is confined in position.

2. In a hub and axle-bearing, the combination of an axle-journal, a hub having a recess in its outer end mounted thereon, means occupying this recess whereby the hub is confined on the axle against endwise movement,
 85 balls interposed between these means and the opposite end of the hub and holders for each of these balls. 90

3. In a hub and axle-bearing, the combination of a hub having a recess in its outer end, means contained in this recess whereby the
 95 hub is confined on the axle against endwise movement in either direction, balls interposed between these means and the opposite end of the hub, holders for each one of these balls and a dust-cap to close this recess. 100

4. In a hub and axle-bearing, the combination of an axle-journal, a hub mounted thereon, a nut carried at the outer end of the former to hold the hub in position and having sockets provided in its inner side and a
 105 ball contained in each one of these sockets and adapted to bear against the opposite end of the hub.

5. In a hub and axle-bearing, the combination of an axle-journal, a hub mounted thereon, a nut carried at the outer end of the former to hold the latter in position and having sockets provided in its inner side, a bearing-ring secured to the outer end of the hub
 110 and balls interposed between this latter and the nut, one contained in each of the sockets of this latter. 115

6. In a hub and axle-bearing, the combination of an axle-journal, a hub having a recess in its outer end mounted thereon, a nut
 120 carried at the outer end of the axle-journal to hold the hub in position and occupying the recess in the outer end of this latter, a dust-cap to close this recess and a ball carried by this latter and adapted to bear against
 125 the end of the axle-journal.

7. The combination in a hub and axle-bearing of means whereby the hub is confined on the axle against endwise movement in either
 130 direction, balls interposed between opposite surfaces of endwise-engaging parts of these means, separable holders for each of these

balls whereby they are partly inclosed and which have openings to permit the balls to come in contact with the opposite surface.

5 8. In a hub and axle-bearing, the combination of an axle-journal, a hub mounted thereon having a recess in its outer end, and means attached to it within said recess adapted to bear against the opposite end of the axle-journal thereby preventing the hub from moving inwardly on this latter and a nut at the outer end of the axle-journal which operating in conjunction with the means mentioned confines the hub in both directions.

15 9. The combination of an axle-journal, a hub recessed in both its ends mounted thereon, a nut 15 having sockets 17 to hold it in place, balls in each of these sockets, holders 18 and 19 adjustably secured by means of a screw connection which hold these balls in position, a ball 24 supported opposite the end of the axle-journal and adapted to bear against the same, a dust-cap to close the recess in the front end of the hub and a washer to perform the same function at the rear end.

25 10. The combination of an axle-journal, a

hub recessed in both its ends mounted thereon, a nut 15 having sockets 17 to hold it in place balls in each of these sockets, holders 18 and 19 adjustably secured by means of a screw connection which hold these balls in position, a ball 24 adapted to engage and bear against the outer end of the axle and a socketed dust-cap within the outer recess of the hub which supports this ball and holds the same in position on the hub. 30

11. In a hub and axle-bearing, the combination of an axle-journal, a hub mounted thereon, a nut to hold it in position, a ball adapted to engage and bear against the end of the axle-journal and means attached to the hub which supports this ball and confines the same to a position whereby it is held opposite the center of the axle-journal. 35 40

In testimony whereof I hereunto set my hand in the presence of two witnesses.

ANDREW J. THEIRING.

Witnesses:

C. SPENGEL,
ARTHUR KLINE.