

No. 812,829.

PATENTED FEB. 20, 1906.

N. W. CRANDALL.
DOOR CHECK AND CLOSER.
APPLICATION FILED OCT. 5, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

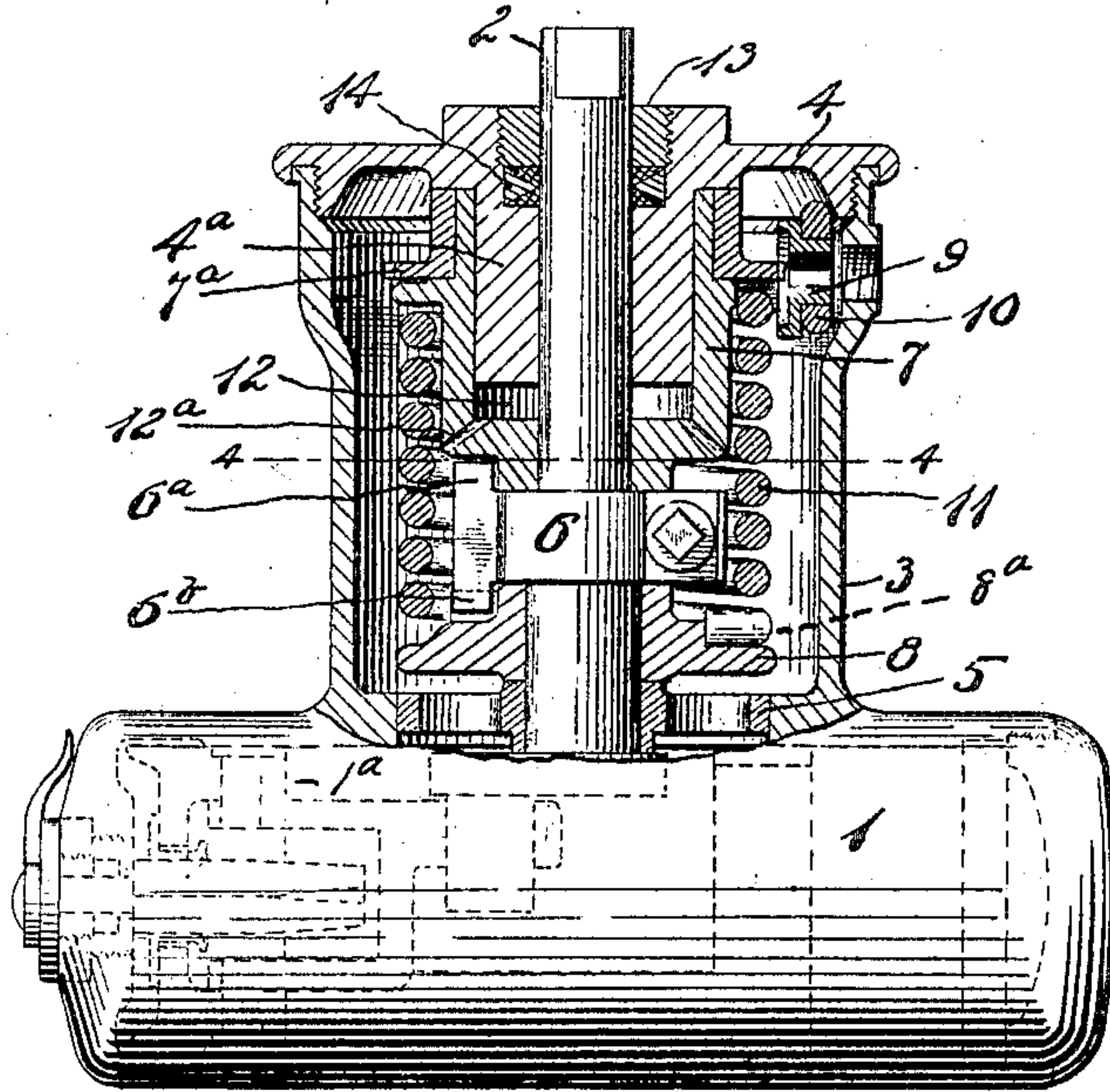


Fig. 2.

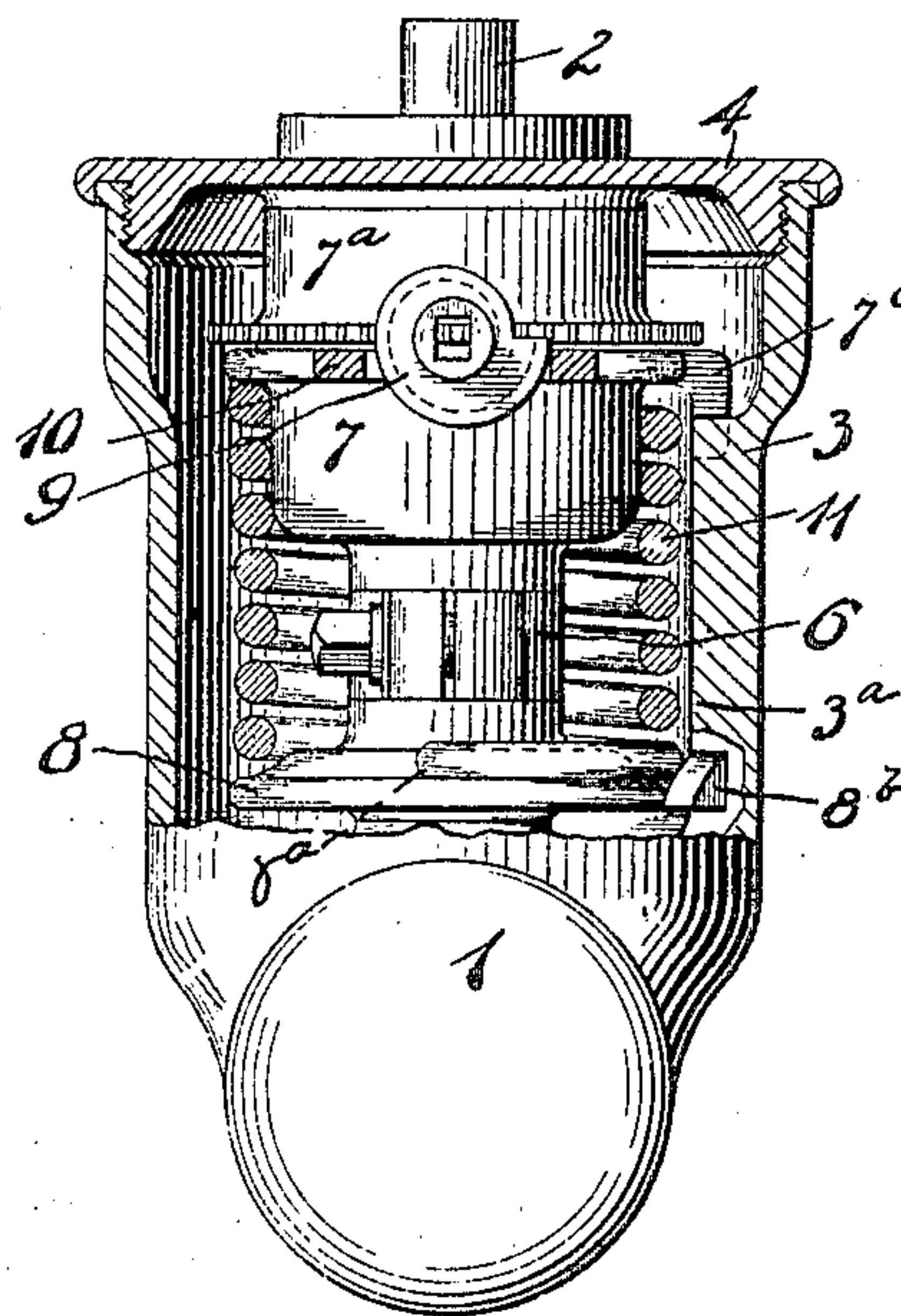
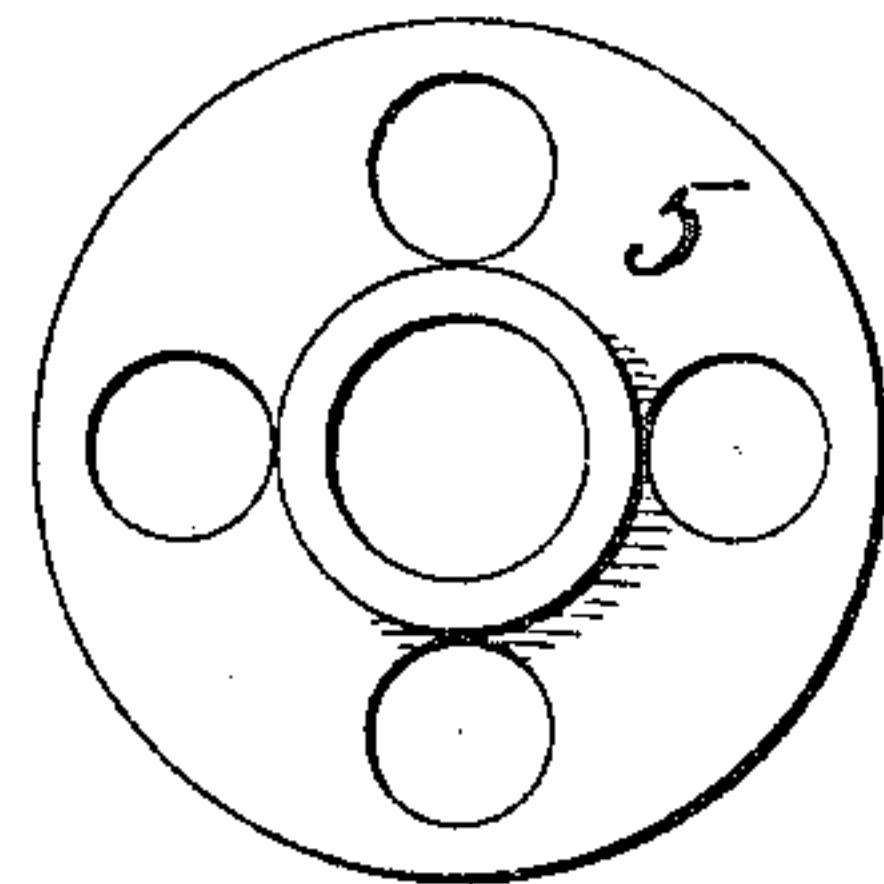


Fig. 10.



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2 SHEETS—SHEET 2.

Fig. 3.

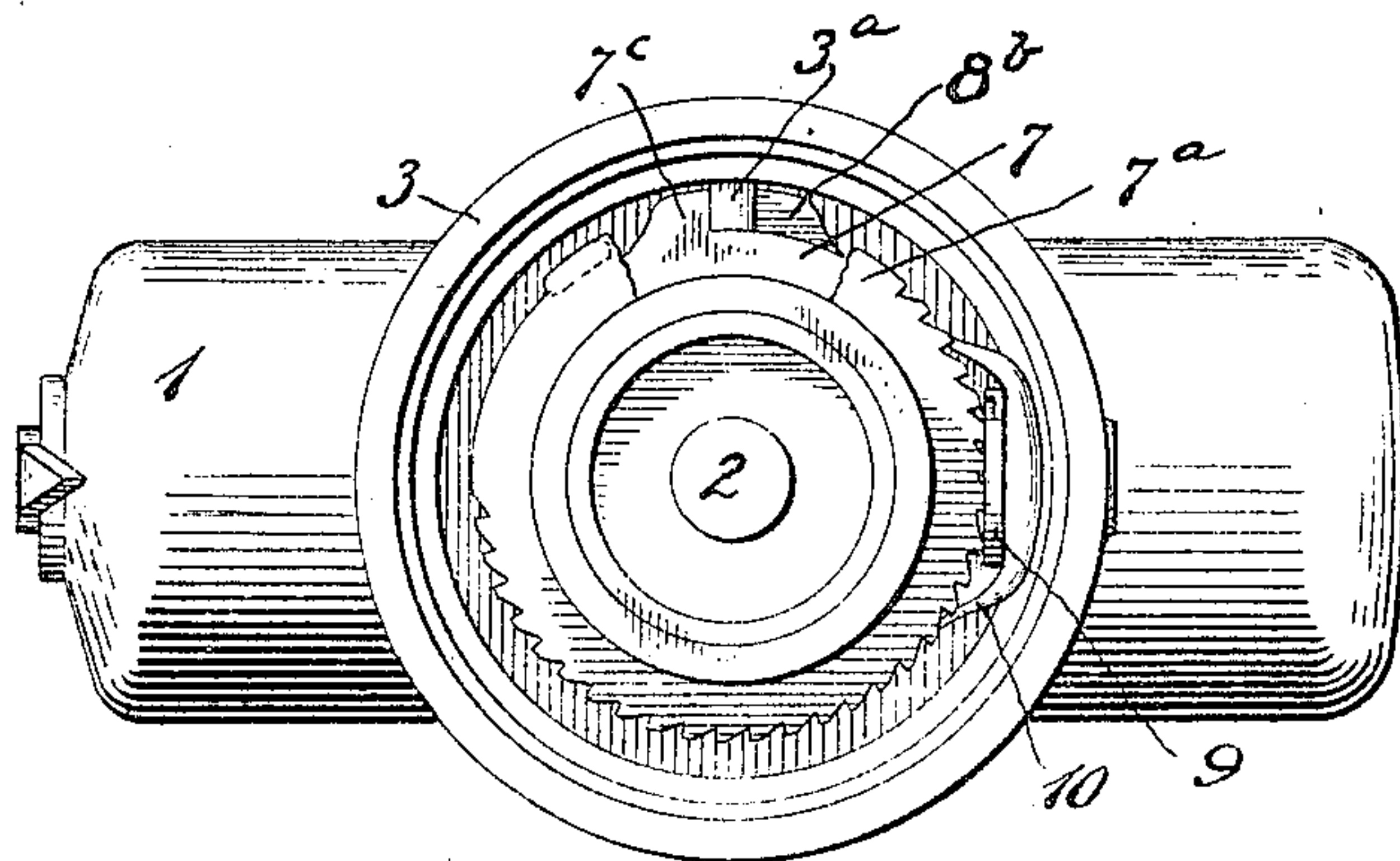


Fig. 5.

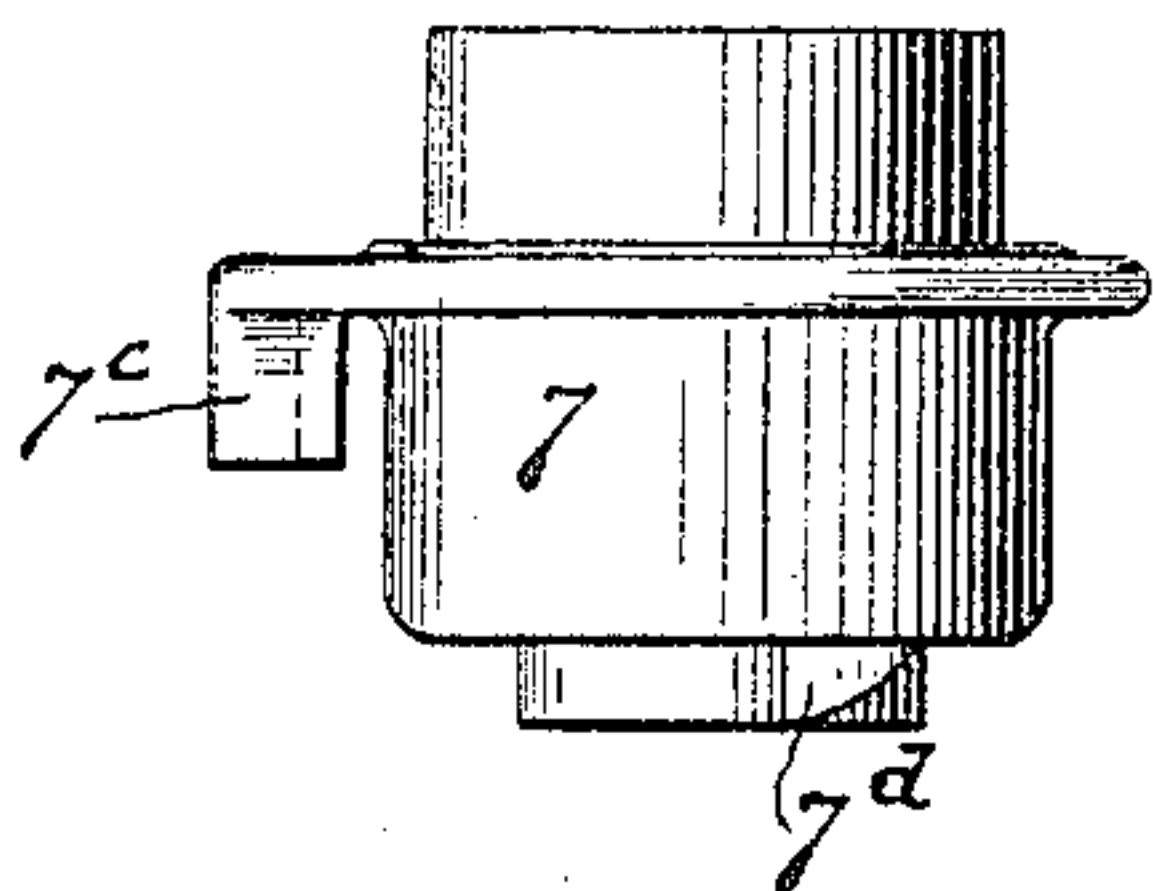


Fig. 6.

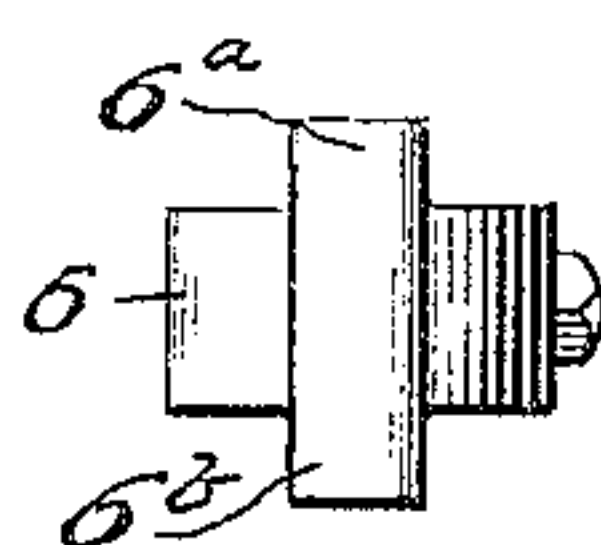


Fig. 7.

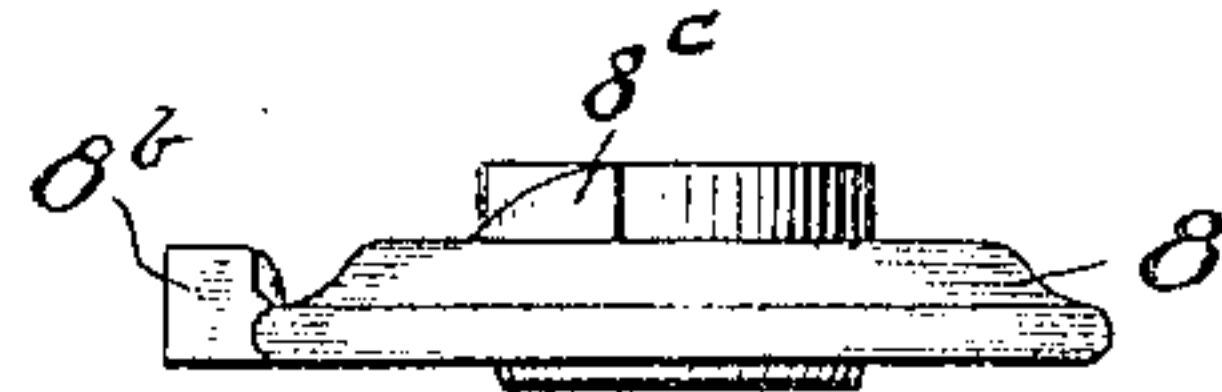


Fig. 8.

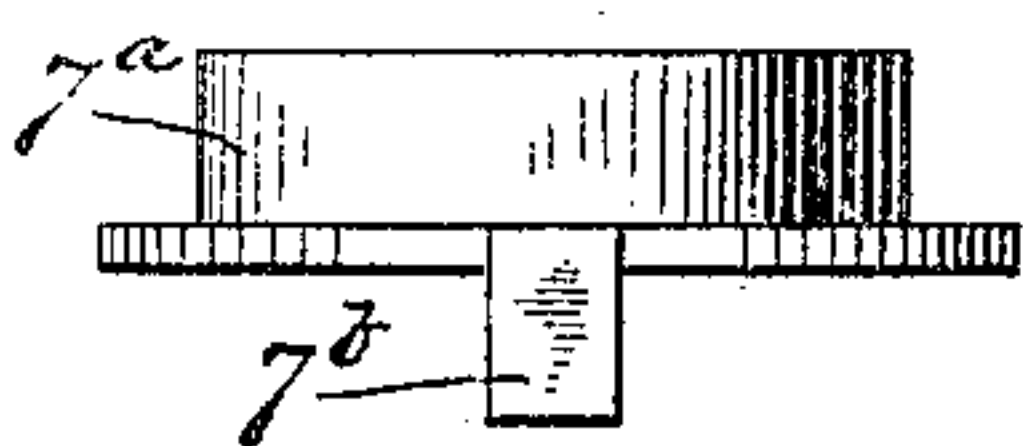


Fig. 9.

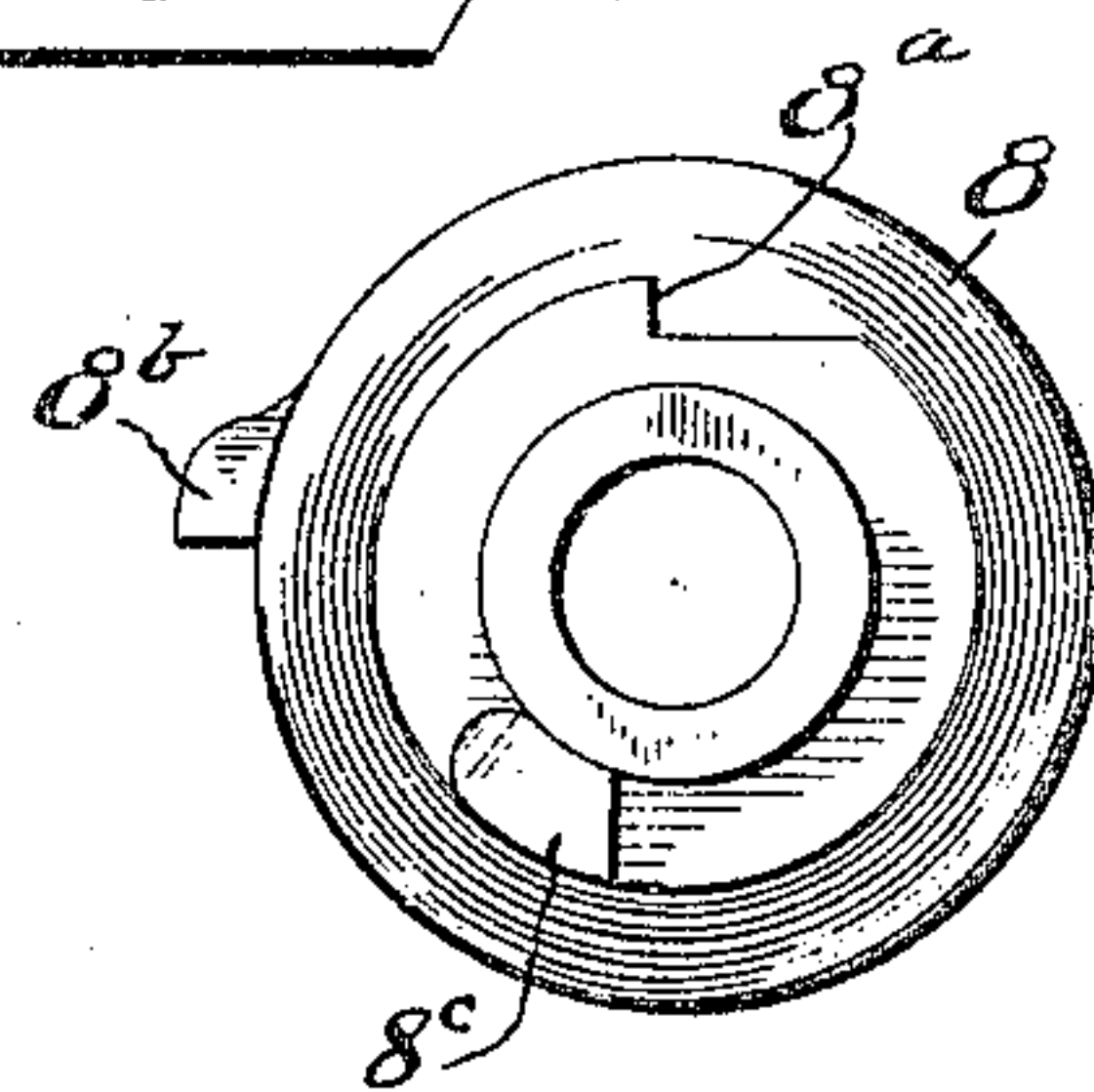
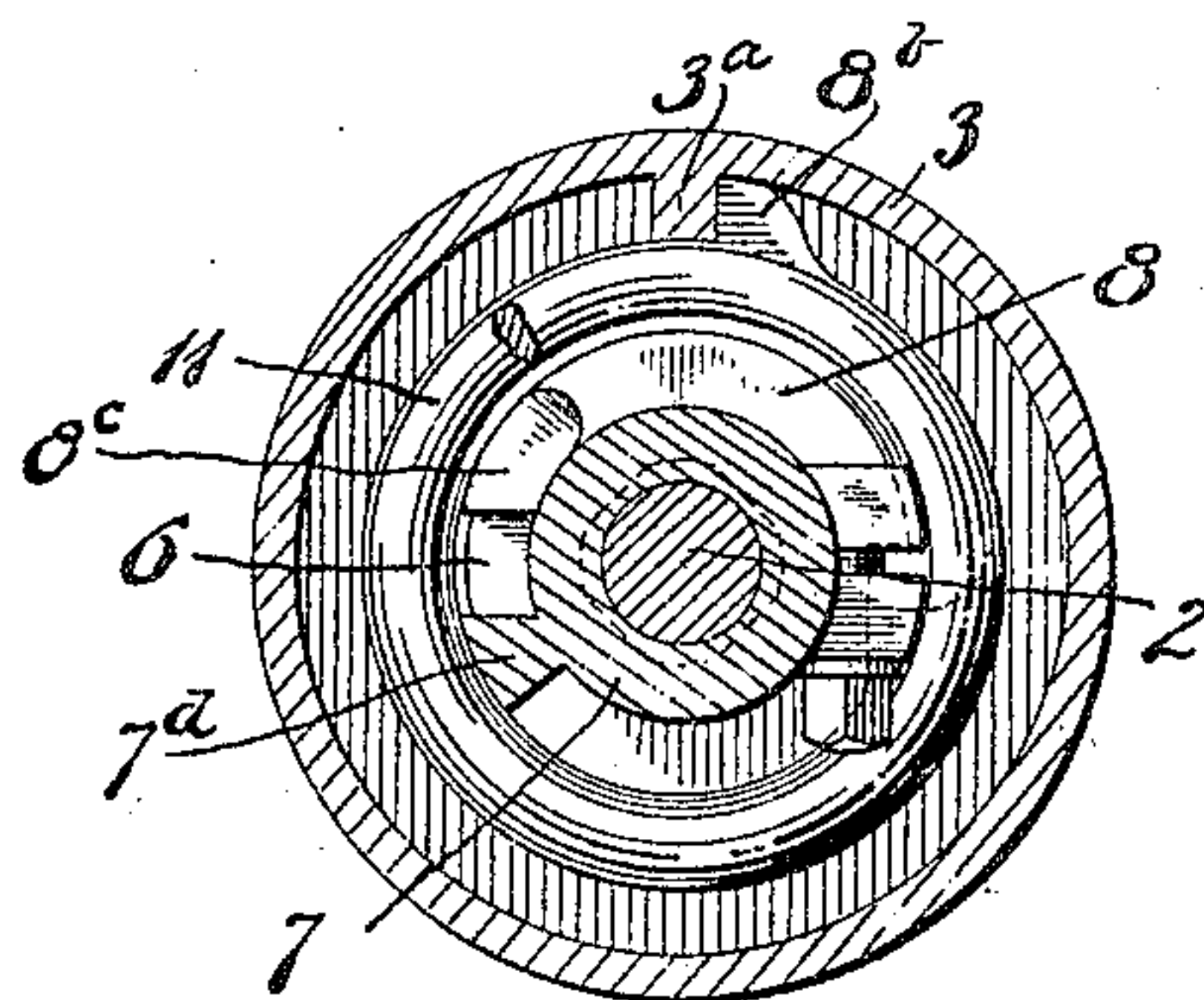


Fig. 4.



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UNITED STATES PATENT OFFICE.

NATHAN W. CRANDALL, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO
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DOOR CHECK AND CLOSER.

No. 812,829.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed October 5, 1904. Serial No. 227,196.

To all whom it may concern:

Be it known that I, NATHAN W. CRANDALL, a citizen of the United States, residing at New Britain, in the county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Door Checks and Closers, of which the following is a full, clear, and exact description.

My invention relates to door checks and closers, and particularly to the spring mechanism therefor, means of varying the tension thereof, and means to facilitate assembling.

Ordinarily in assembling the spring mechanism of apparatus of the type herein referred to it is necessary to introduce the several parts piece by piece in the frame or case, requiring expert skill and much labor. This is avoided by my construction.

In the accompanying drawings, Figure 1 is a side elevation of a door check and closer, the spring-chamber and therein-contained parts being shown in section. Fig. 2 is an end view of said parts, the casing being broken away and the internal parts being partially in section. Fig. 3 is a plan view with certain parts removed and partially broken away. Fig. 4 is a horizontal section on line 4-4, Fig. 1. Figs. 5, 6, 7, 8, 9, and 10 are views of separate parts detached.

The door check and closer in the particular form shown and described comprises a casing affording a piston-chamber 1 and a spring-chamber 3. In the former the checking-piston is located.

1^a represents the checking-piston. (See dotted lines, Fig. 1.) This checking-piston may be of any well-known pattern. The piston is arranged to move to and fro by reason of its operative connection with the spindle 2, which in turn carries the usual lever-arm (not shown) by which connection is made with the door to which the check is applied.

4 is a cap for the spring-chamber 3. The cap 4 is provided with a hub 4^a, which constitutes the upper bearing for the spindle 2.

5 is a perforated spider suitably fitted within the case at a point about where the section 1 joins the section 3. This spider is perforated to afford communication between the liquid or piston chamber and the spring-

chamber, and the same constitutes the lower bearing for the spindle 2.

Fixedly mounted upon the spindle 2 is what I term a "middle" dog 6, having the vertically-extended shoulders 6^a and 6^b. An upper dog 7 is rotatably supported upon the spindle-bearing 4^a, while the lower dog 8 is rotatably supported on the spindle itself. The upper dog 7 has rotatably mounted thereon an adjustable collar 7^a, which is toothed at its outer periphery and is engaged by a snail 9, mounted in a bracket 10 on the upper dog 7. When the snail 9 is rotated, it obviously shifts the sleeve 7^a upon the upper dog 7.

11 designates a spring. The lower end of said spring is hooked onto the lower dog 8, as at 8^a. The upper end of the spring is hooked onto a depending shoulder or arm 7^b on the collar 7^a.

3^a designates a rib or stop on the inner surface of the case 3. The upper dog 7 carries a lug 7^c at its outer edge, which normally bears on one side of the stop 3^a. The lower dog 8 carries a lug 8^b at its outer edge, which normally bears on the opposite side of said stop 3^a.

The extended shoulders 6^a and 6^b when all of the parts are in the normal position stand between and engage, respectively, the inner lugs 7^d and 8^c on the upper and lower dogs.

From the foregoing it will be seen that the spindle makes a connection indirectly with both ends of the spring 11 through the medium of the upper and lower dogs. If the spindle is turned in a right-hand direction, it turns the middle dog 6, causing the shoulder 6^b to rotate the lower dog 8 through the medium of the inner lug 8^c, the shoulder 6^a receding from the inner lug 7^d of the upper dog 7, the latter being held against rotation, the lug 7^c abutting against the stop 3^a on the casing 3. This movement increases the tension of the spring, which when the spindle is released returns the latter to its normal position, (see Fig. 4,) the lug 8^b coming to rest again against the stop 3^a. Should the spindle be rotated in a reverse direction, the shoulder 6^a on the middle dog 6 rotates the upper dog 7 through the medium of the inner

lug 7^d, the shoulder 6^b receding from the inner lug of the lower dog, the latter being held against rotation by the engagement of outer lug 8^b of said dog against stop 3^a on the casing 3.

It will be observed that the sleeve 7^a rotates simultaneously with and to the same extent as the dog 7, because the snail 9, which is carried by the dog 7, is always in mesh with the notched edge of said sleeve. The pitch of the thread on the snail is so slight that it is self-locking. Normally the snail assumes the position shown best in Figs. 1 and 3, at which point an entrance-opening may be formed in the part 3 of the case to permit of the introduction of a suitable tool for turning said snail to vary the tension of the spring 11. A suitable cap or plug (not shown) may be screwed into this opening when the parts are assembled and ready for use. The upper dog is supported partly by the spindle 2 and hub 4^a, and there is preferably an air-space 12 provided between the lower end of the latter and the adjacent inner wall of the dog. This space affords a cushioning-chamber to prevent the liquid in the check from being pumped out.

12^a 12^a are backflow-ports leading from space 12 back to the interior of the case. As a further check against leakage a stuffing-box may be provided in cap 4, which stuffing-box is accessible from the outside. This stuffing-box comprises a gland 13, by which the packing is held in place. I preferably provide within the packing-space below the gland 13 an annulus 14, preferably of metal, the inner edge of which is tapered, as best seen in Fig. 1. The packing is placed above and below the ring 14, so that when the gland 13 is screwed down it will have a tendency to crowd the packing toward the shaft 2.

I have not attempted to describe herein the piston or the lever-arm by which the spindle is connected to the door, since such parts are well known. The tendency of the spring is to restore the spindle 2 to its normal position whether the latter is rotated in one direction or the other. Hence the apparatus may be applied to either a right or a left hand door without modification.

Inasmuch as the adjusting mechanism is contained entirely within the casing and is carried by one of the rotatable parts of the spring mechanism, sufficient clearance should be afforded, as shown, between it and the inner wall of the case to prevent interference.

It is apparent from the foregoing that the various parts of the spring mechanism may be assembled independently of the check and outside of the check-casing. The several parts for the purpose of assembling would be put together as follows: The spider 5 is first slipped into place on the spindle 2. The lower dog 8 is then slipped over said spindle. The middle dog 6 is then applied. The

spring 11 is then put in place. The upper dog 7 and its coacting parts are then placed on the spindle, and, finally, the cap-piece 4 is applied. The ends of the spring are anchored to the retaining lugs or shoulders on the upper and lower dogs. The parts being thus assembled as a unit are ready to be slipped into their final position within the case-section 3. When this is done, the cap may be screwed down and the proper tension given to the spring in the manner before described. Should it become necessary at any time to repair or replace any of the aforesaid parts, it is merely necessary to unscrew the cap 4 and remove them bodily from the case for that purpose.

What I claim is—

1. In a liquid door check and closer, a case including a piston-chamber and a spring-chamber, checking mechanism including a piston, and closer mechanism including a spring, all contained within said case, a spindle connected to both said piston and said spring, a removable lower spindle-bearing between the spring-chamber and piston-chamber, a communicating passage between said chambers, a removable upper spindle-bearing projecting downwardly into the spring-chamber, a spring-controlled dog rotatably mounted upon said upper spindle-bearing, an air-chamber formed between said upper dog and said upper bearing, and backflow-ports connecting said space with the interior of said spring-chamber.

2. In a device of the character described, a spindle, a double-acting spring, independently-movable dogs indirectly connecting the spring with said spindle, one of said dogs being formed of two members one adjustable relatively to the other, said spring being connected directly with the adjustable member of said dog and a rotatable adjusting device comprising a snail carried by one of said members and coacting with the other.

3. In a device of the character described, a spindle, a spring, independently-movable dogs indirectly connecting the spring with said spindle, one of said dogs being formed of two members one adjustable relatively to the other, said spring being connected directly with the adjustable member of said dog, and a self-locking adjusting device carried by one of said members and engaging the other.

4. In a device of the character described, a spring, a spring tension-adjusting device comprising a rotatable member, a dog, a sleeve mounted thereon and rotatable relatively thereto, a projection or lug on said sleeve arranged to be directly connected with said spring, a toothed flange on said sleeve, a snail carried by said dog and engaging said toothed flange whereby the rotation of the snail will shift the angular position of said sleeve relatively to its support.

5. In a device of the character described,

a casing forming a spring-chamber, a spindle-bearing in the lower part thereof, another spindle-bearing in the upper part thereof, a spindle supported by said bearings, a dog
5 fixed on said spindle, two movable dogs carried by said spindle, and coöperating with the fixed dog, a spring directly connected with one of said movable dogs and adjustably and indirectly connected with the other of said

movable dogs and means within said casing for varying the adjustment of said spring with the last-mentioned dog.

Signed at New Britain, Connecticut, this 28th day of September, 1904.

NATHAN W. CRANDALL.

Witnesses:

M. S. WIARD,

F. E. SUNBURN.