

No. 720,489.

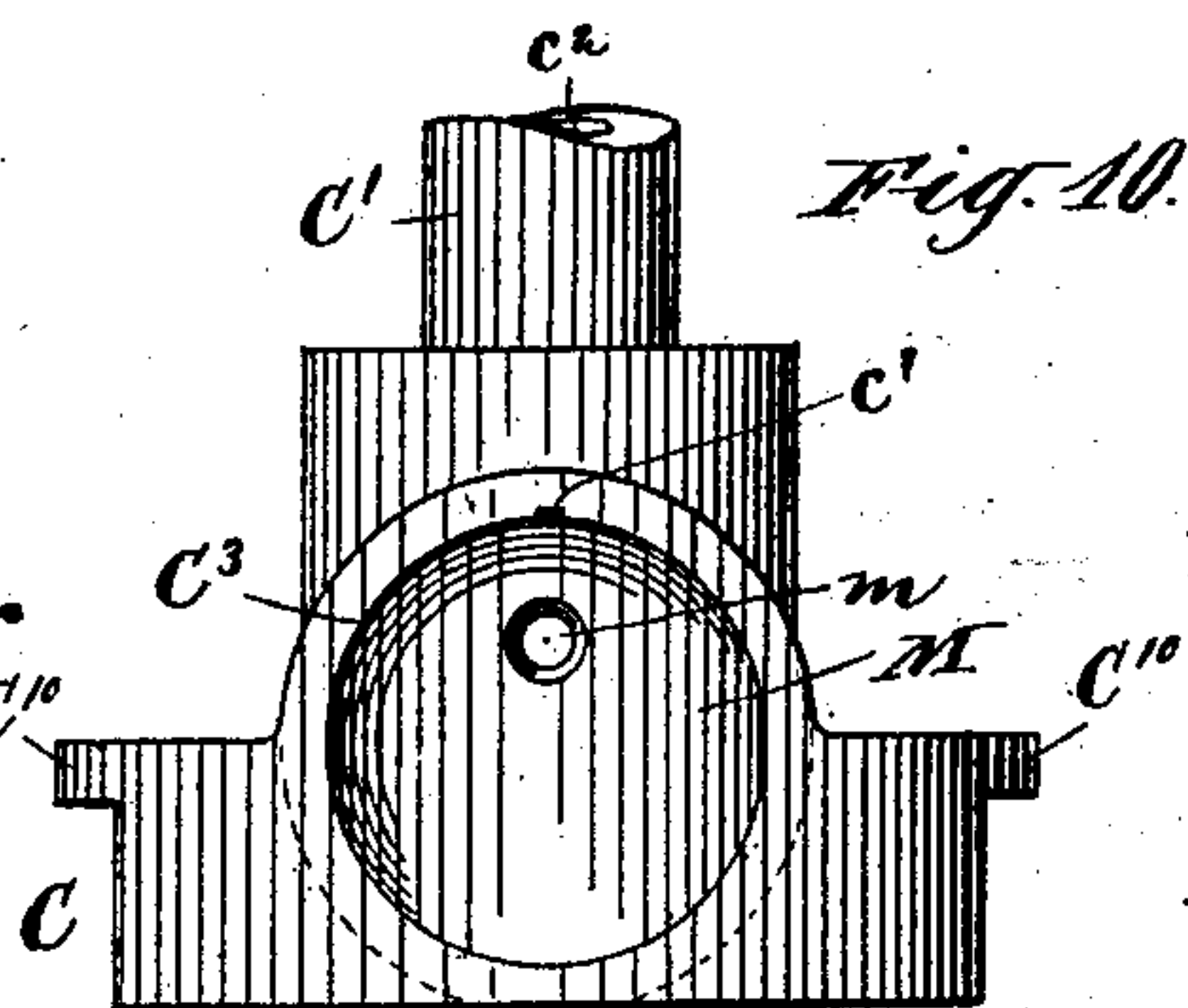
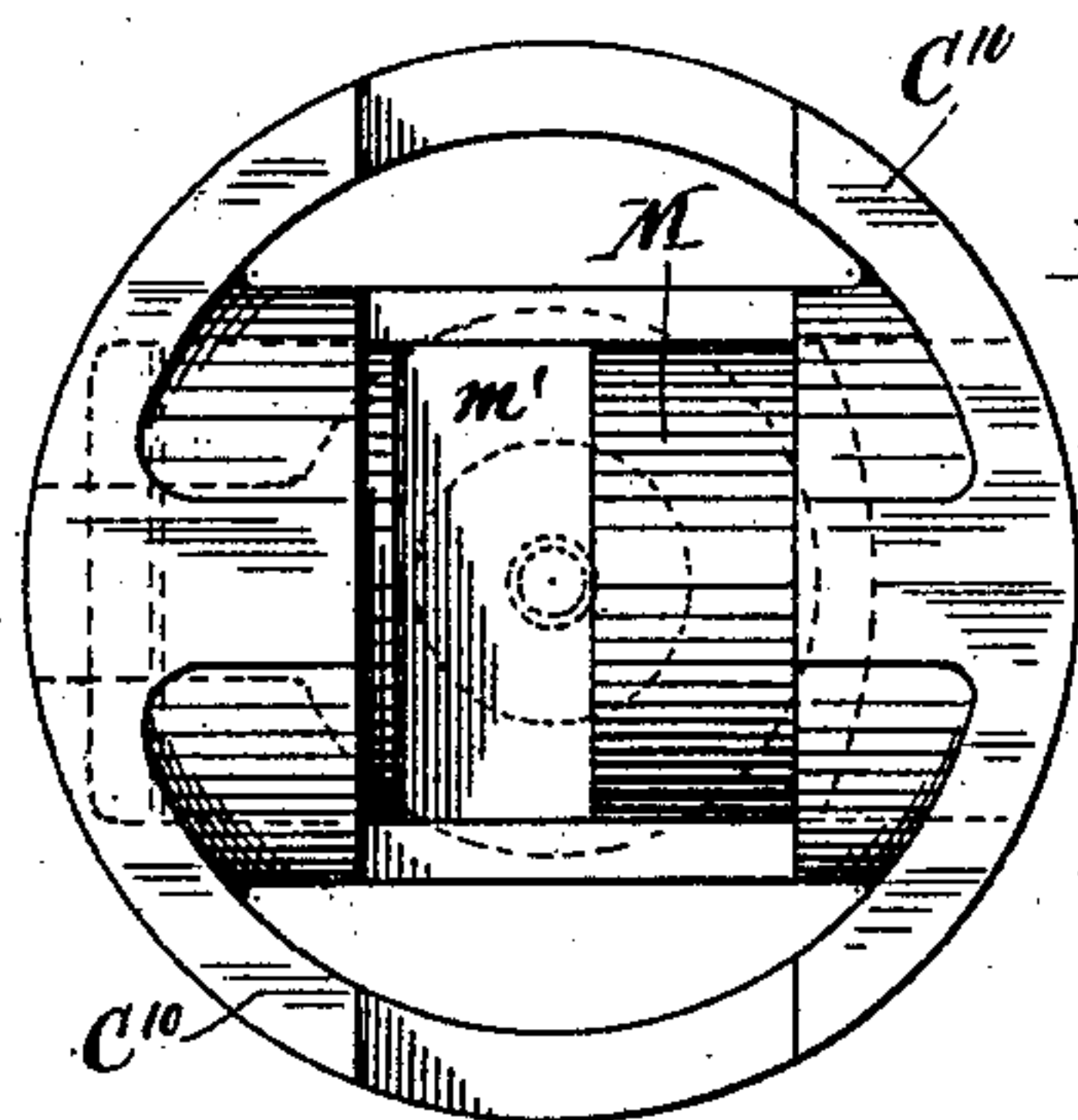
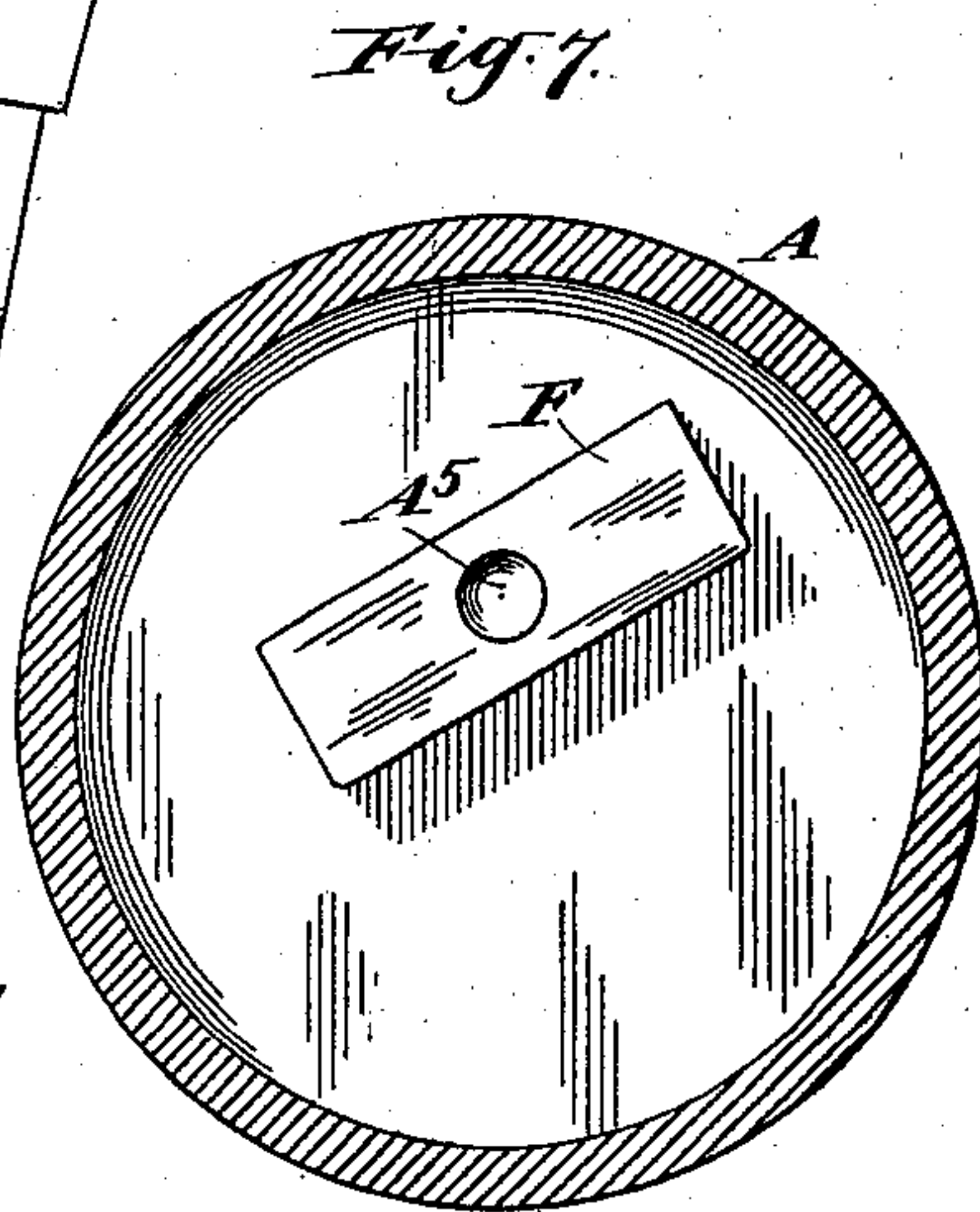
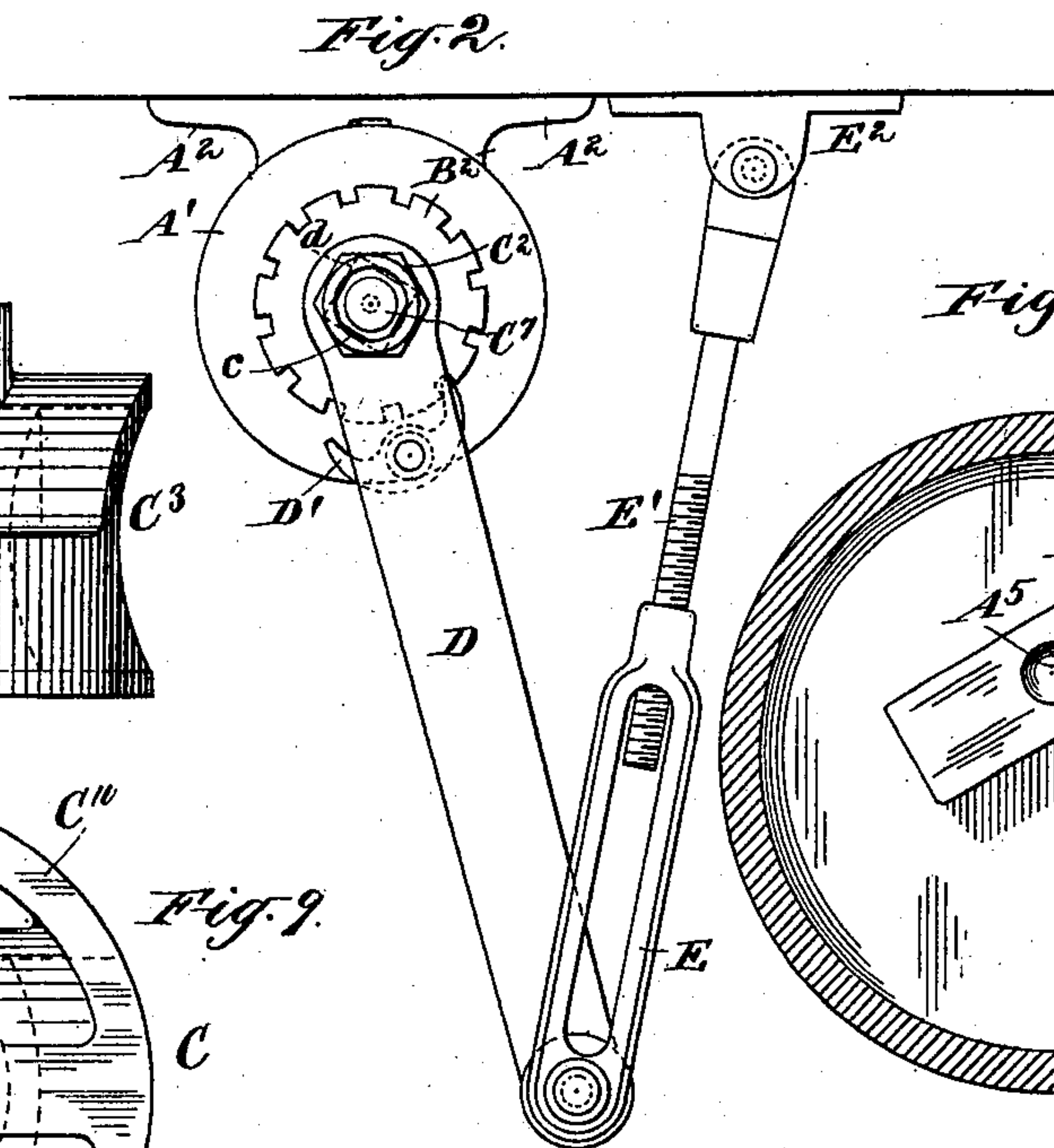
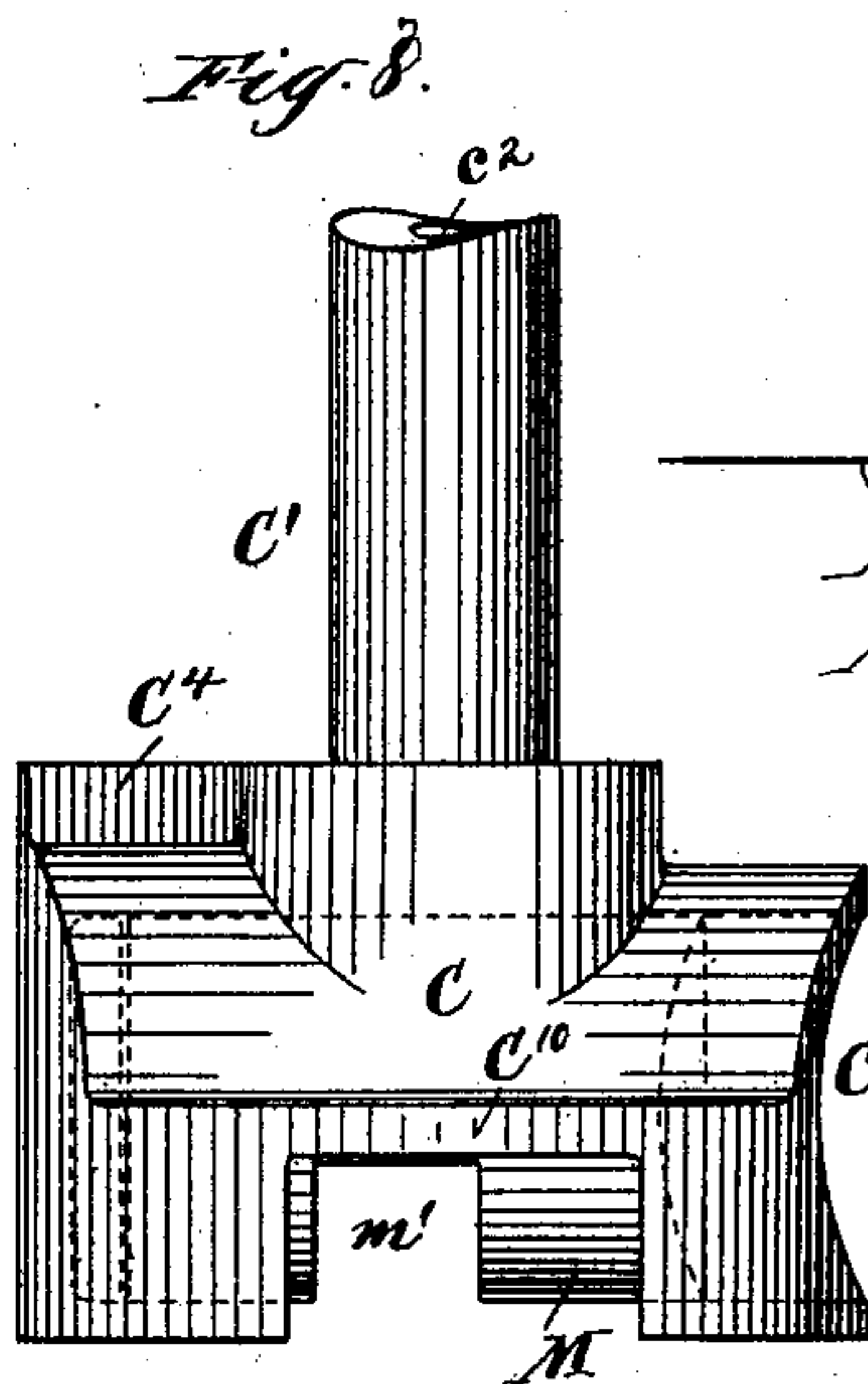
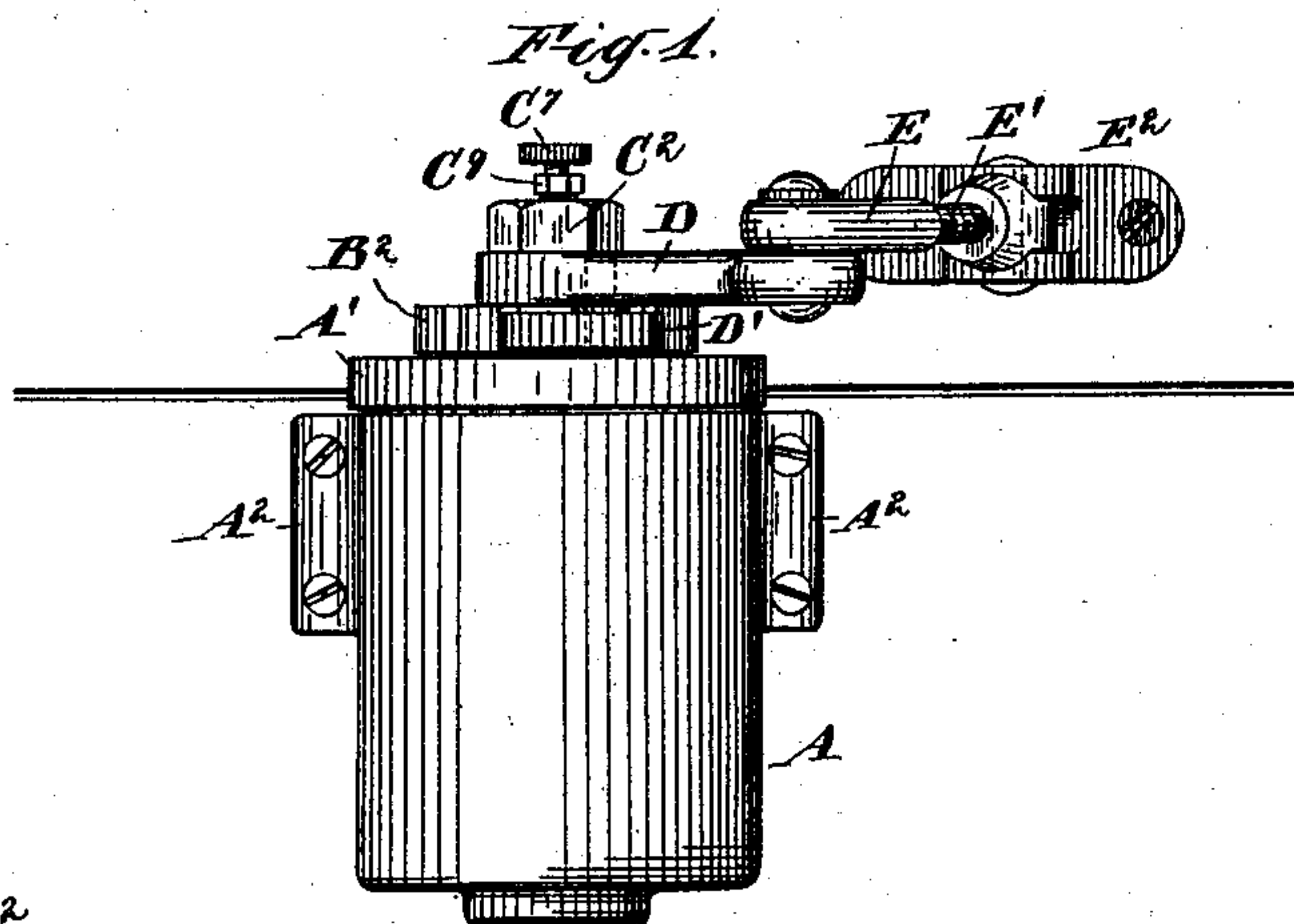
PATENTED FEB. 10, 1903.

A. J. ROSENTERER.
DOOR CLOSER AND CHECK.

APPLICATION FILED JUNE 10, 1902.

NO MODEL.

2 SHEETS--SHEET 1.



Witnesses:
Chas. F. Hannington
Wm. C. C.

Inventor:
Albert J. Rosentriter,
by his attorney
Charles R. Searle.

No. 720,489.

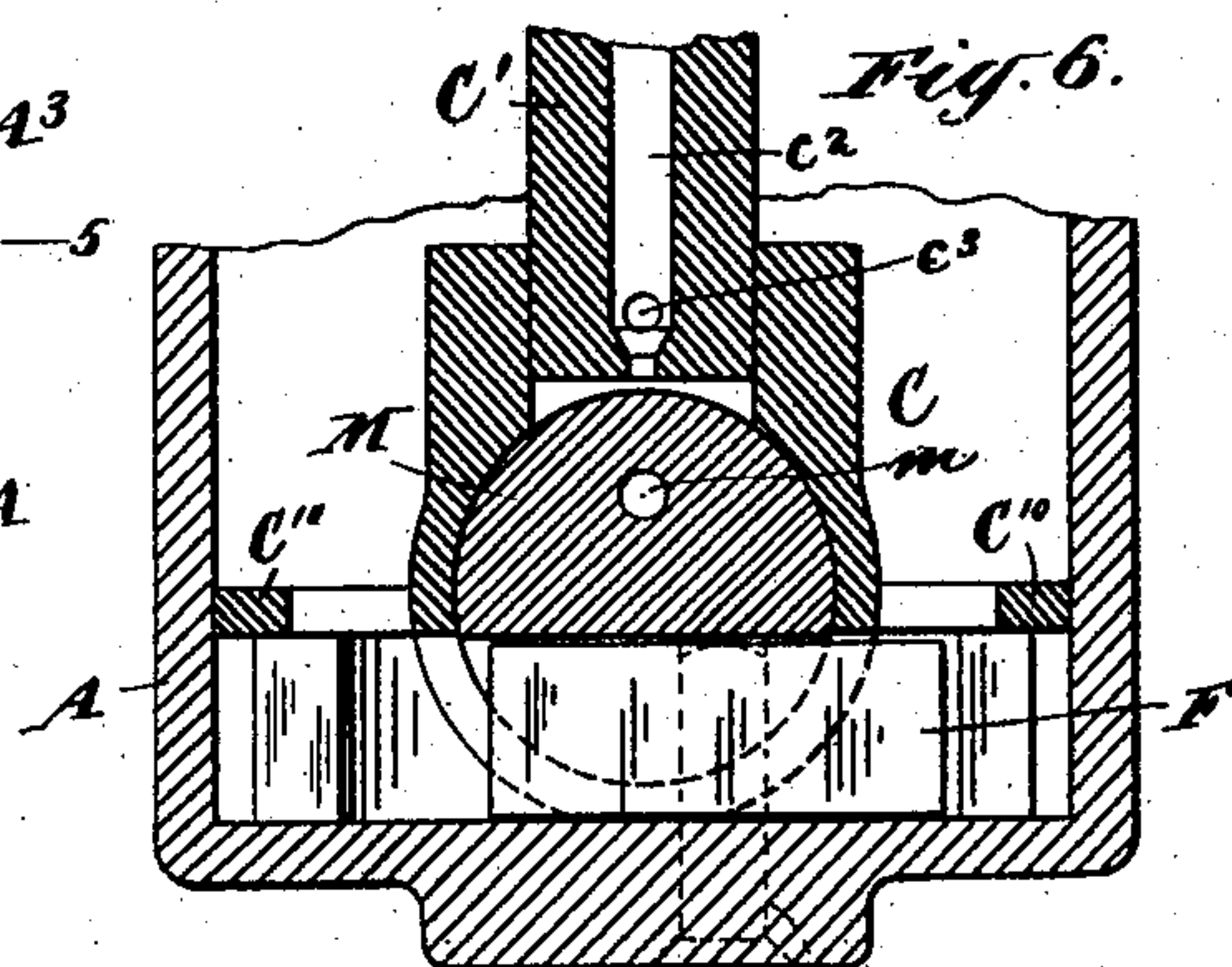
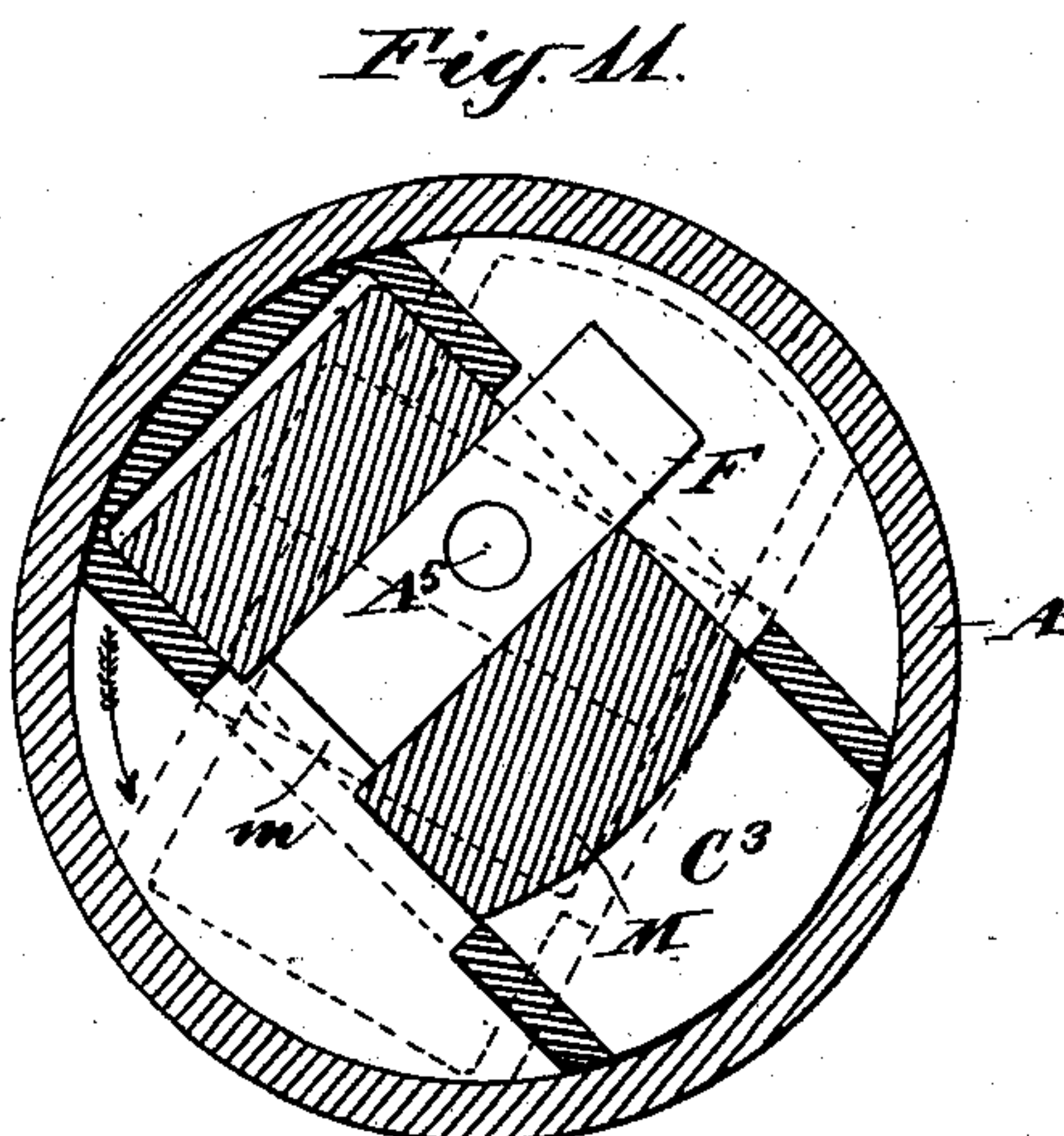
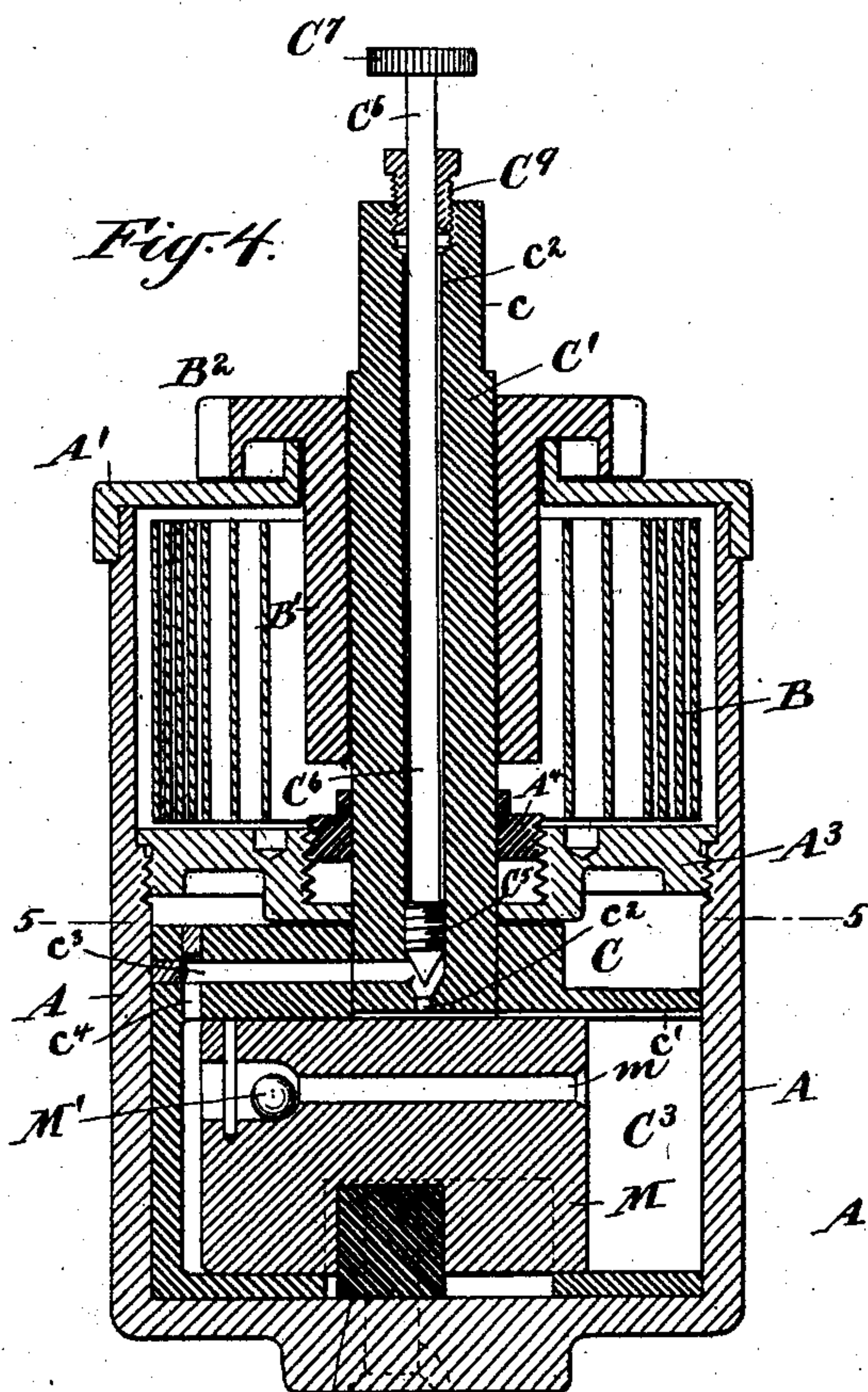
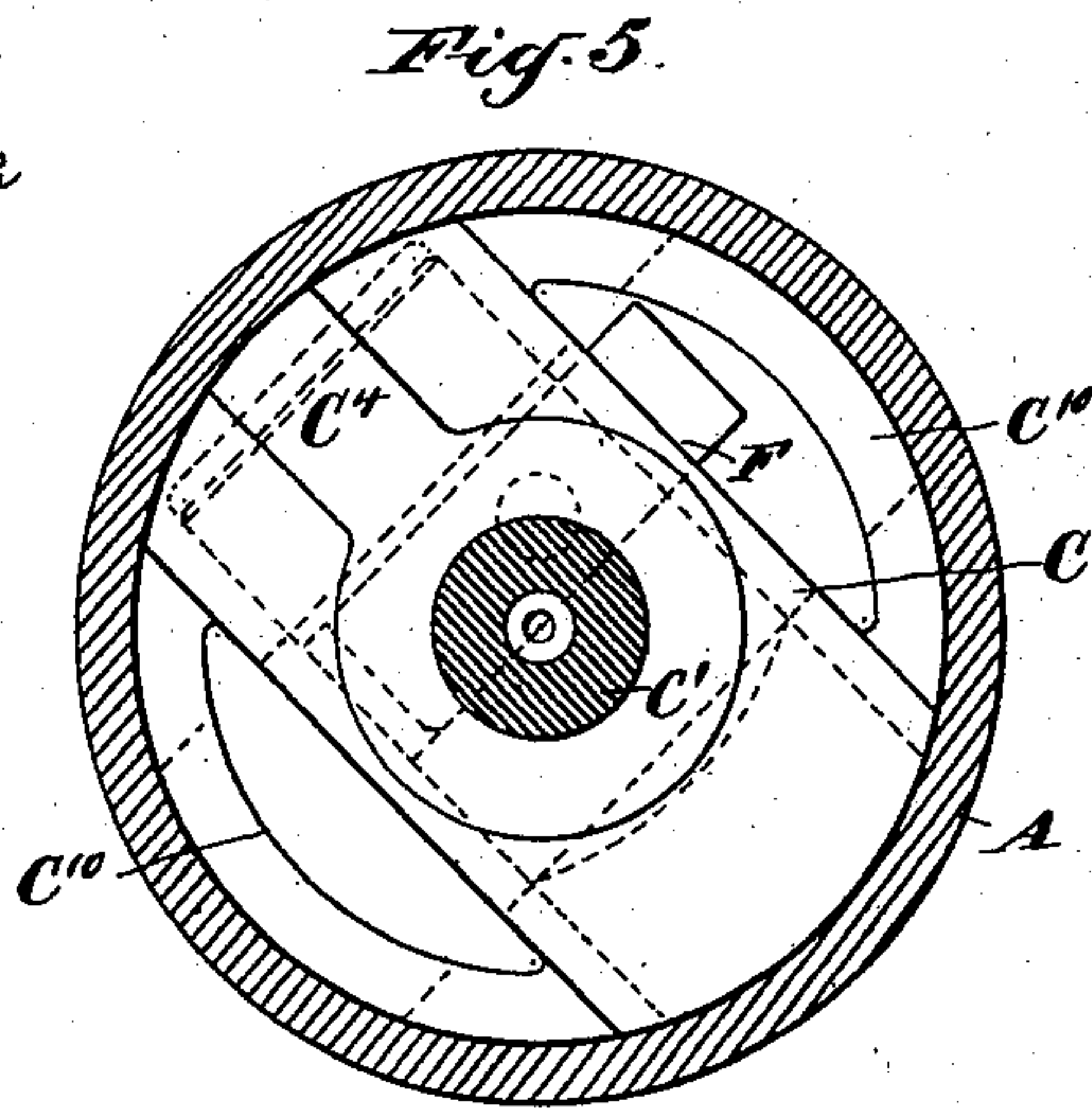
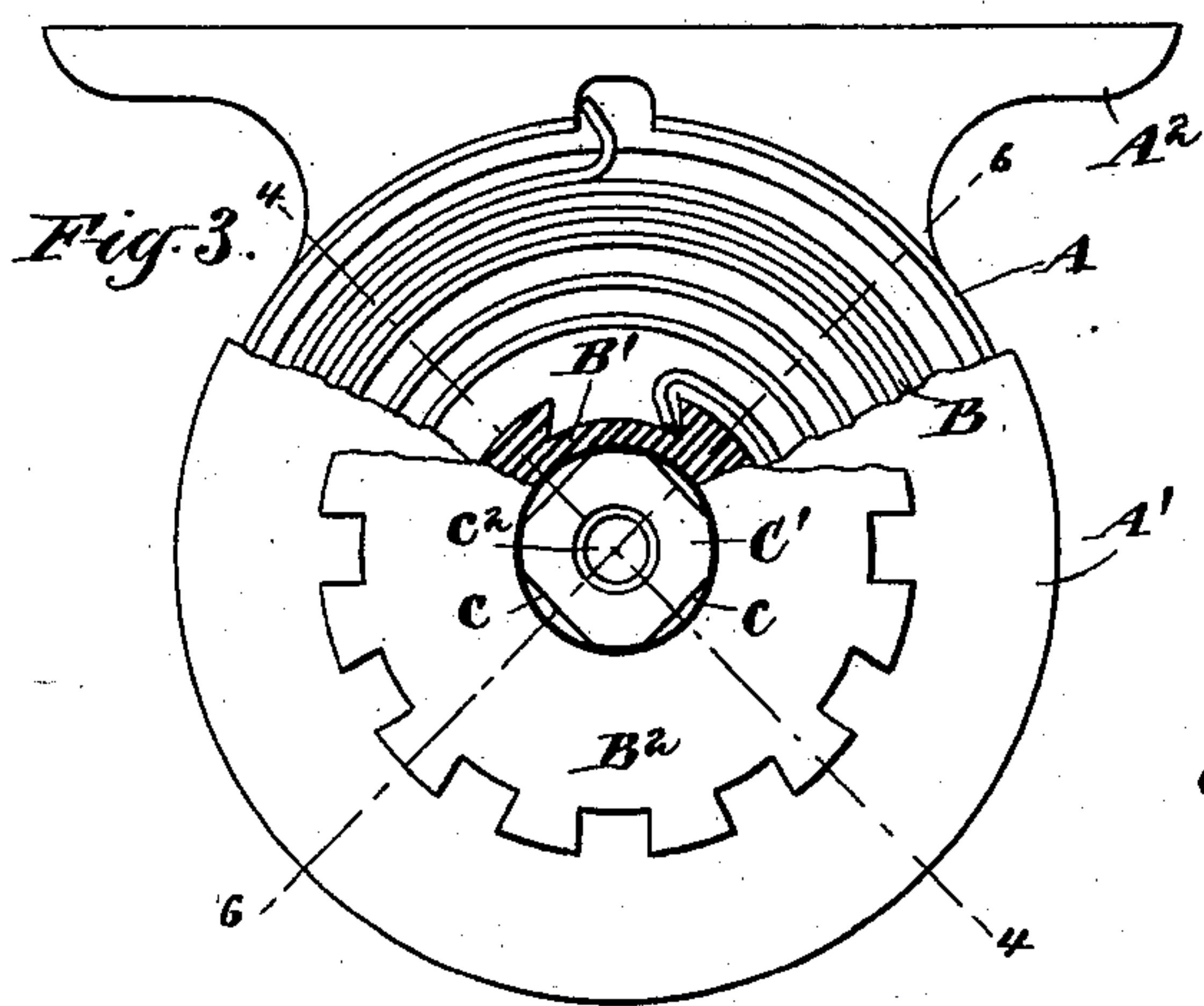
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NO MODEL.

2 SHEETS--SHEET 2.



Wienepfer: F A⁵
Chas. F. Harrington
M. L. Cannon

Witnessed
A⁵ Inventor:
Albert J. Rosentreter,
by his attorney,
Charles R. Searle.

UNITED STATES PATENT OFFICE.

ALBERT J. ROSENTER, OF BOONTON, NEW JERSEY, ASSIGNOR TO
JOSEPH BARDSLEY, OF MONTCLAIR, NEW JERSEY.

DOOR CLOSER AND CHECK.

SPECIFICATION forming part of Letters Patent No. 720,489, dated February 10, 1903.

Application filed June 10, 1902. Serial No. 111,009. (No model.)

To all whom it may concern:

Be it known that I, ALBERT J. ROSENTER, a citizen of the United States, residing in Boonton, in the county of Morris and State of New Jersey, have invented a certain new and useful Improvement in Door Closers and Checks, of which the following is a specification.

The invention relates to that class of door closers and checks in which the closing action is induced by a spring and is checked by the transfer of liquid through a contracted passage leading from one side of a piston to the other.

The object of the invention is to simplify the mechanism, reduce the labor and expense involved in making and assembling the parts, and more especially to provide a construction in which the severe strains to which devices of this class are subjected shall be successfully resisted for long periods without the necessity of repairs.

The invention consists in the parts and combinations of parts by which the above objects are attained and in certain novel features and details of construction and arrangement to be hereinafter described.

The accompanying drawings form a part of this specification and show a preferred form of the invention.

Figure 1 is a front elevation, and Fig. 2 is a plan view, showing my improved door closer and check in position for service. The remaining figures are on a larger scale. Fig. 3 is a plan view corresponding to Fig. 1, but with certain portions removed and others broken away to show the parts beneath. Fig. 4 is a corresponding vertical section taken on the line 4 4 in the preceding figure. Fig. 5 is a horizontal section on the line 5 5 in Fig. 4. Fig. 6 is a vertical section corresponding to the lower portion of Fig. 4, the plane of section being at a right angle to that figure, as indicated by the line 6 6 in Fig. 3. Fig. 7 is a horizontal section and plan of the lower portion of the casing with the working parts removed. Fig. 8 is an elevation of the cylindrical head containing the piston. Fig. 9 is a view of the under face of the same, and Fig. 10 is a corresponding elevation at a right angle to Fig. 8. Fig. 11 is a horizontal sec-

tion on a plane below that of Fig. 5, showing the operation of the piston.

Similar letters of reference indicate the same parts in all the figures where they appear.

The main casing (marked A) is cylindrical in form, having a cap A' covering its open upper end and having lugs A² A², by which it may be attached to the door, as usual. A transverse horizontal partition A³ divides the interior of the casing into an upper or spring chamber and lower or liquid chamber, the former containing a coiled spring B, engaged at one end with the casing and at the other with a sleeve B', having the notched head or flange B², lying upon the cap A'. The liquid-chamber is finished interiorly and is occupied by a head C, matching thereto and free to partially rotate or oscillate therein, having an actuating shaft or spindle C', extending axially upward through a stuffing-box A⁴ in the partition A³, through the sleeve B', and terminating above the latter. The projecting end is screw-threaded and is also flattened on four sides, as indicated at c, to receive the squared opening d in a radial arm D, secured in place by a nut C². On the lower face of the arm is a dog D', adapted to engage either of the notches in the flange B² and with the latter and its sleeve perform the usual function of holding the spring at the desired tension and transmitting its force to the arm. The free end of the arm is, as usual, connected to the door-casing by any suitable means, preferably with provisions for lengthening and shortening to conform to conditions. I have shown this connection as comprising the link E, screw E', and housing E². The act of opening the door winds the spring in the direction to increase its tension, and on releasing the door it exerts its force through the arm and connections to return the door to the closed position, as usual in this class of devices. The action also partially rotates the shaft C' and head C within the liquid-chamber, as will be understood.

The checking device for restraining the closing action is carried in the head C and consists of a piston fitted in a transverse cylinder and passages through which the oil or other liquid with which the lower chamber is

supplied is allowed to transfer from one end of the piston to the other, with means for controlling the flow and with means for moving the piston and cylinder relatively to each other. The cylinder C^3 is formed by boring from one side of the head nearly to the opposite side and receives the piston M , loosely mounted therein. The latter is drilled longitudinally to form a passage m and counter-bored at the inner end to receive a ball M' , serving as a check-valve to permit free passage for the liquid to the closed end of the cylinder when the piston moves by the act of opening the door and to close when the movement is in the opposite direction. A groove c' on the upper interior of the open end of the cylinder C^3 communicates with a hole c^2 , drilled axially of the actuating-shaft C' , connected with a radial passage c^3 , drilled in the raised portion C^4 of the head, which in turn joins the vertical passage c^4 , communicating with the interior of the cylinder at or near its closed end.

The hole c^2 in the shaft C' extends its entire length and is large enough to allow the introduction of the conical screw plug or valve C^5 , carried on the rod C^6 and operated by a milled head C^7 , by which the plug may be raised or lowered relatively to its seat C^8 at the junction of the hole c^2 and radial passage c^3 . The rod C^6 extends through a small stuffing-box C^9 on the upper end of the shaft to prevent the escape of liquid, and it may be turned as required to increase or diminish the area of the passage and correspondingly hasten and retard the closing action of the door.

Motion is imparted to the piston M by a fixed pin A^5 , set eccentrically in the bottom of the liquid-chamber and engaged in a transverse groove in the under side of the piston. I prefer and have shown the pin as provided with a loosely-mounted rectangular block F , matching with and received in a corresponding groove or notch m' in the piston, for the reason that the block offers greater surface to the groove and insures better engagement with the piston in all positions of the latter. The piston being thus engaged, a partial revolution of the head C on its axis carries the piston with it, but by reason of the eccentricity of the fixed pin causes the piston to make, in effect, a reciprocation in the cylinder for one complete revolution or oscillation of the head. In practice and as shown in Fig. 11 provision is made for about three-fourths of a revolution as the extreme movement. The full lines in that figure show the piston at one end of its stroke—the position assumed when the door is closed. The act of opening the door rotates the head in the direction indicated by the arrow; but the piston while free to partake of the rotatory movement is held against axial movement, so that when the head has moved to the position shown in dotted lines the piston is nearly at the opposite end of the cylinder, due to the eccentricity of the pin.

The movement in this direction is unrestricted, for the reason that the liquid in the chamber may transfer freely through the passage m and past the valve M' ; but on the return movement under the tension of the spring B the valve closes and the speed of the return flow of the liquid, and consequently the closing movement of the door, is governed by the area of the passages c' , c^2 , c^3 , and c^4 , controlled by the plug C^5 .

I have shown the head C as an open-work casting, as in Figs. 8, 9, and 10, having the ring C^{10} , serving to guide the head in its oscillations and insure its central position in the casing; but such construction is not essential. The lower central portion of the cylinder is removed, as shown, to avoid contact with the block F , and the ring C^{10} is similarly notched for the same purpose. The main strains are in the line of the axis of the cylinder, tending to force the closed end of the latter against the interior of the liquid-chamber, and are distributed over the large area purposely provided at that portion of the head. During the closing movement the frictional contact of this extended surface with the interior of the chamber serves a useful purpose by aiding in retarding the movement of the door. During the opening movement the large passage through the piston allows the liquid to flow freely and pressure tending to force the head laterally in either direction is practically avoided.

The horizontal partition A^3 is preferably screwed in position, the recesses a a being provided to receive the forked end of a suitable wrench or spanner, by which it may be forced to a tight joint, which, with the stuffing-box A^4 in the center of the partition, tightly closes the liquid-chamber and effectually prevents the escape of the oil or anti-freezing liquid with which this portion of the casing is filled and permits the device to be transported and attached or removed in service without danger of spilling the contents.

I have shown the closer and check as applied to a right-hand door. To condition it for service with a left-hand door, the cap A' is removed and the spring B reversed and again engaged in the notches or grooves in the casing A and sleeve B' and the arm D correspondingly placed, as usual in devices of this character.

It will be observed that in this construction the severe strains to which the mechanism in devices of this class are subject are received almost entirely by the head C and transferred through extended surfaces directly to the casing instead of being taken on crank-pins and small bearings for the actuating-shaft, as is usually the case. I attach importance to this fact as lessening the liability of derangement due to wear and fracture, and thus increasing the effective life of the device. In my construction the strains to be resisted by the actuating-shaft are mainly torsional and are easily provided for, the lat-

eral strains being taken by the casing, as above stated.

All the parts may be easily made, requiring but little handwork and having but few finished surfaces, thus reducing the cost of manufacture.

The device is eminently durable, effective in operation, and neat and attractive in appearance by reason of the regular form of the exterior of the casing, which allows it to be easily and smoothly finished.

I claim—

1. In a door closer and check, a casing having a closed liquid-chamber, a head matching and adapted to oscillate within said chamber, an actuating-shaft for said head, a cylinder, a piston therefor and eccentrically-disposed means actuated by the oscillation of said head for reciprocally moving said piston and cylinder relatively to each other.

2. In a door closer and check, a casing having a closed liquid-chamber, a head matching said chamber and adapted to be oscillated therein, an actuating-shaft for said head, a cylinder, and piston therefor carried in said head, a pin set eccentrically in said chamber and engaging said piston, whereby the oscillation of the head will reciprocally move said cylinder and piston relatively to each other.

3. In a door closer and check, a casing having a closed liquid-chamber, a head matching said chamber and adapted to oscillate therein, an actuating-shaft for said head, a piston-cylinder formed in the latter, a piston within said cylinder, a fixed pin set eccentrically in said chamber and engaging said piston, whereby the oscillation of said head

will reciprocally move said cylinder and piston relatively to each other.

4. In a door closer and check, a casing having a closed liquid-chamber, a head matching said chamber and adapted to oscillate therein, an actuating-shaft for said head, a cylinder formed in the latter and closed at one end, a loose piston within said cylinder, a fixed pin set eccentrically in said chamber and engaged with said piston, whereby the oscillation of said head will reciprocally move said cylinder and piston relatively to each other, means for permitting liquid to flow freely to the closed end of said cylinder, and means for permitting the return flow from said closed end.

5. In a door closer and check, a casing having a closed liquid-chamber, a head matching said chamber and adapted to oscillate therein, an actuating-shaft for said head, a cylinder formed in the latter and closed at one end, a loose piston within said cylinder, a fixed pin set eccentrically in said chamber and engaged with said piston, whereby the oscillation of said head will reciprocally move said cylinder and piston relatively to each other, means for permitting liquid to flow freely to the closed end of said cylinder, means for permitting the return flow from said closed end, and means for adjustably controlling such return flow.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

ALBERT J. ROSENTER.

Witnesses:

CHARLES R. SEARLE,
DANIEL M. GREGORY.