

(No Model.)

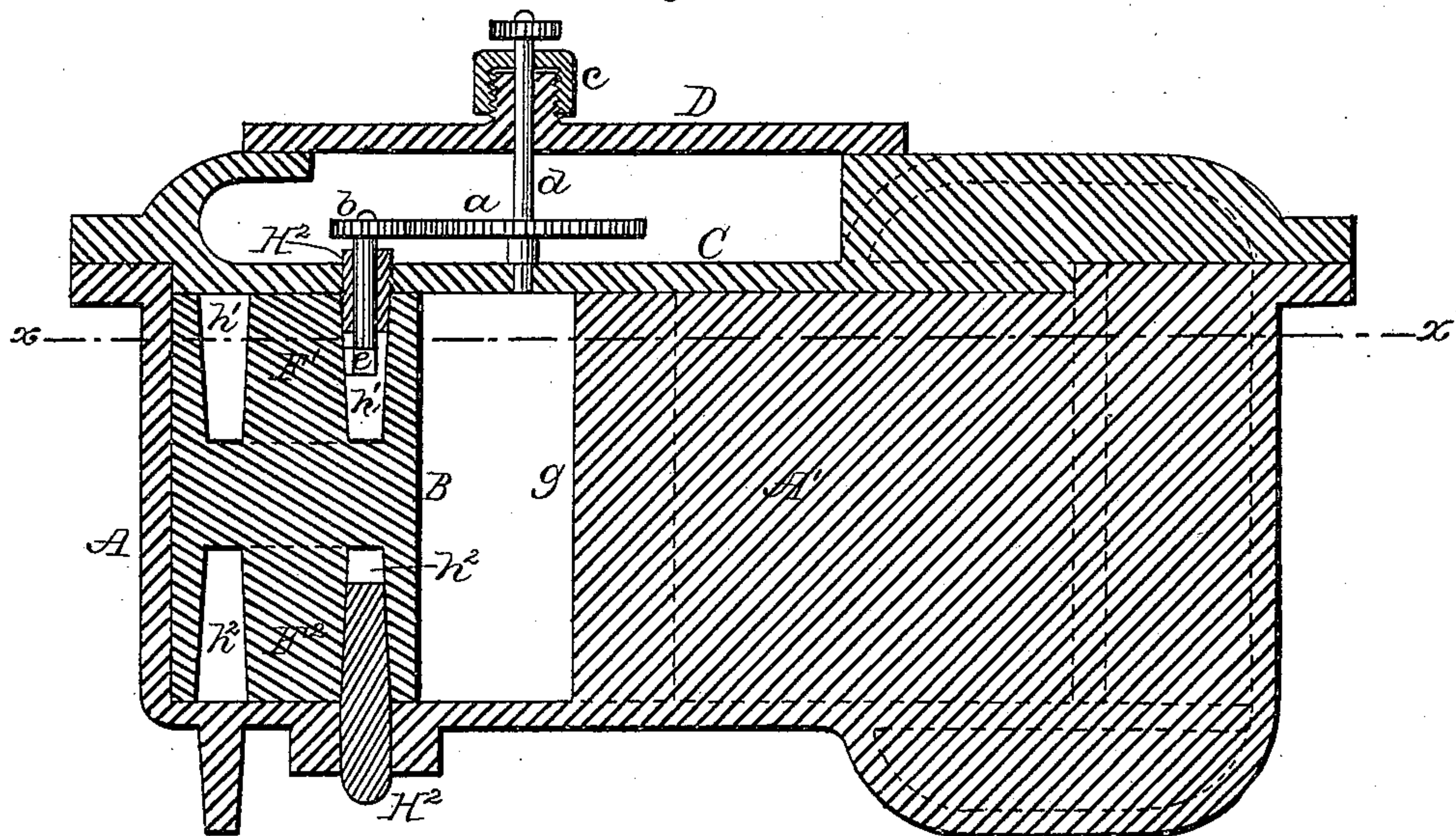
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L. H. NASH.  
OSCILLATING METER.

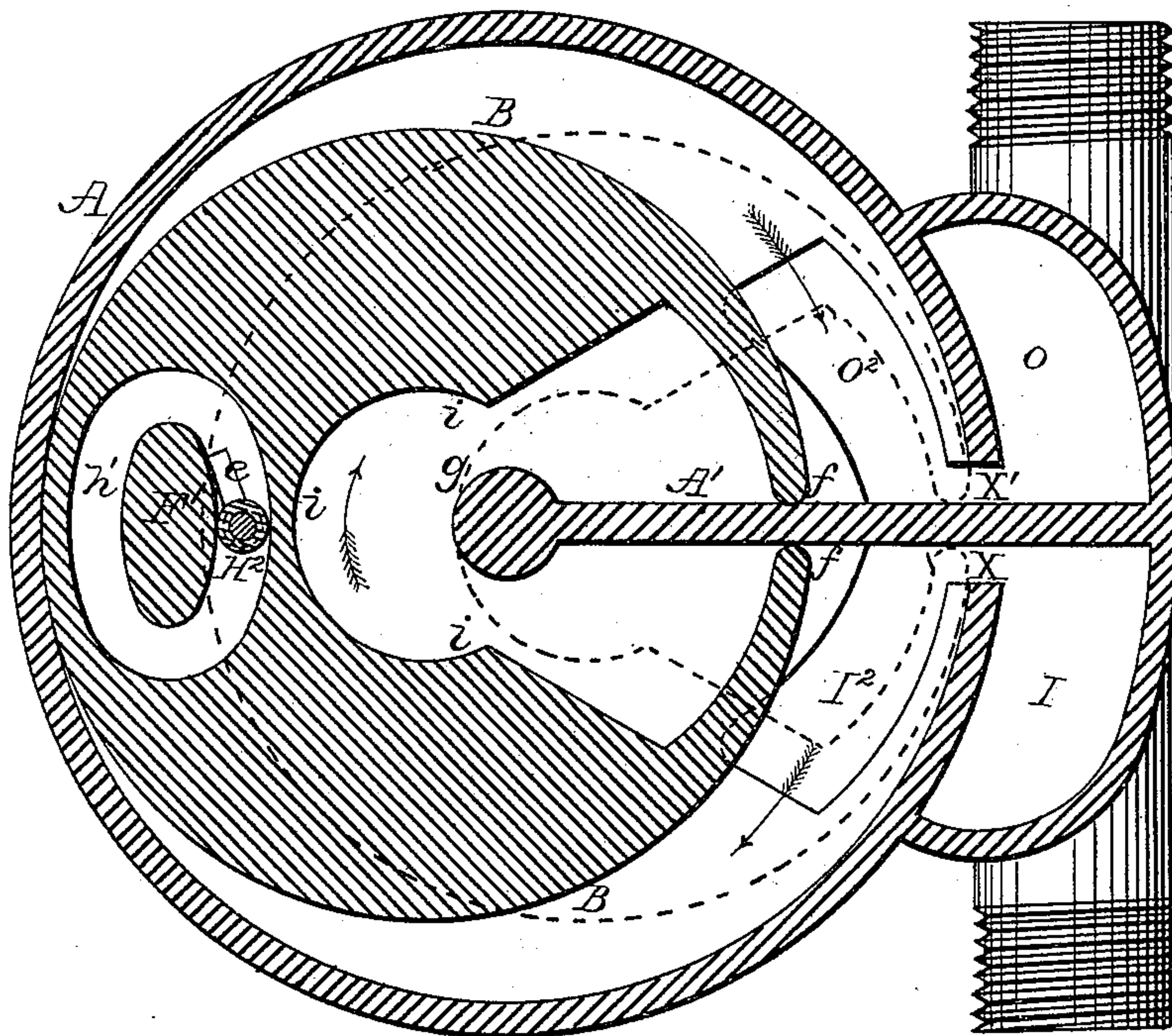
No. 300,627.

Patented June 17, 1884.

*Fig. 1.*



*Fig. 2.*



Witnesses:

*T. C. Bracht.*  
*Nowell Bartle*

Inventor:

*Lewis Hallock Nash*  
*by Johnson & Johnson*

*Attorneys*



(No Model.)

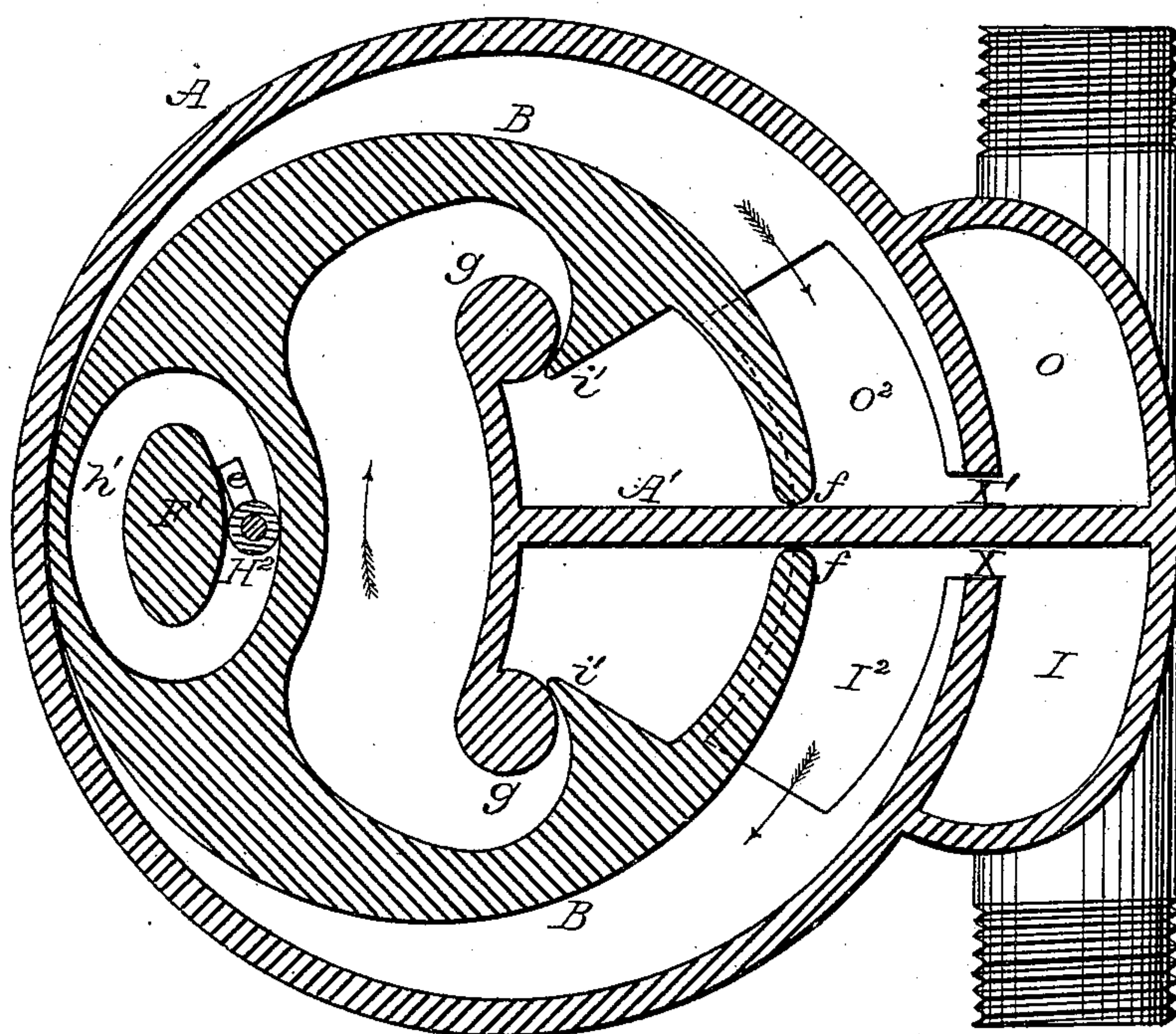
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*Fig. 3.*



*Witnesses:*

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*Inventor*

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by Johnson & Johnson  
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(No Model.)

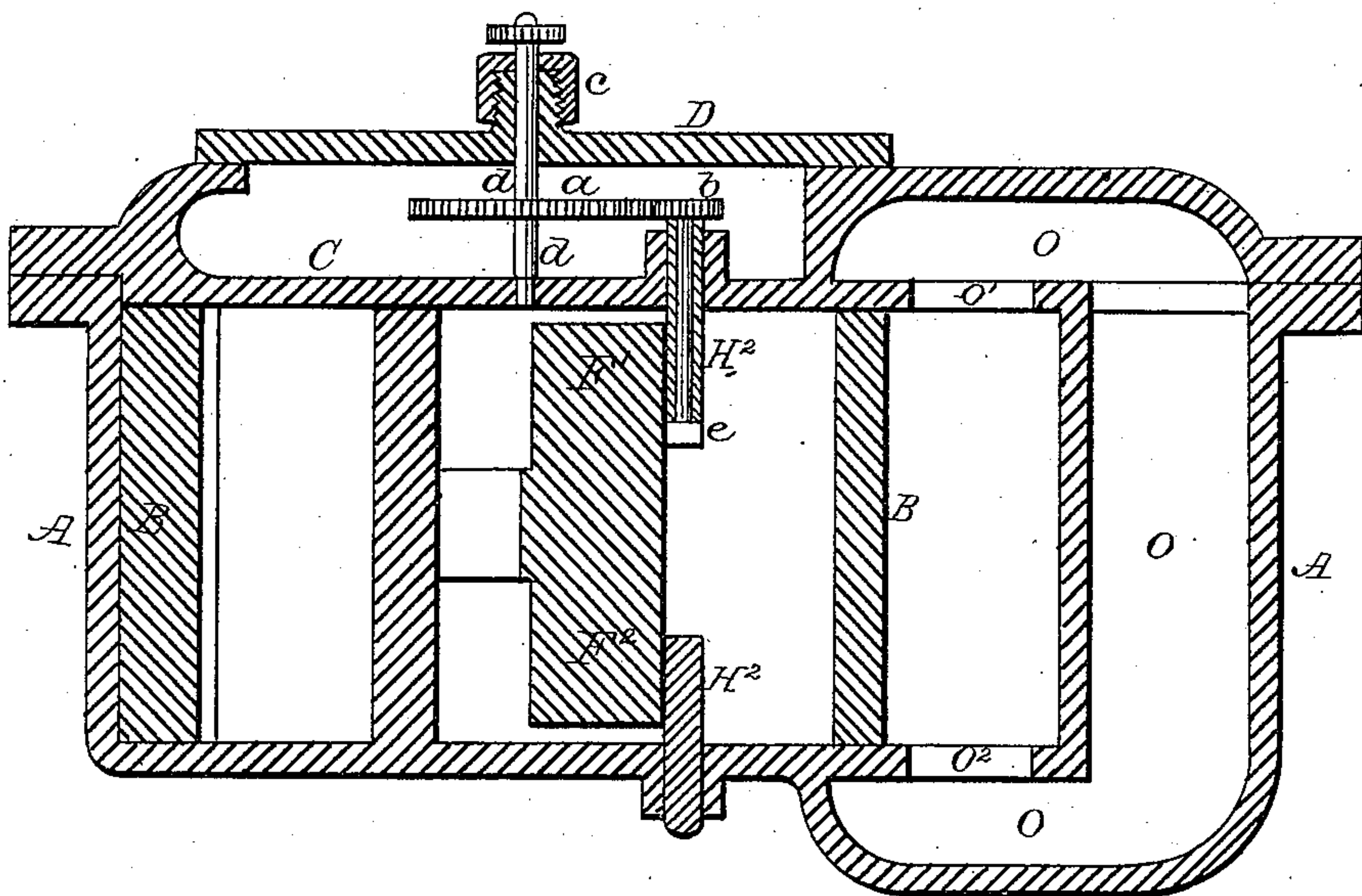
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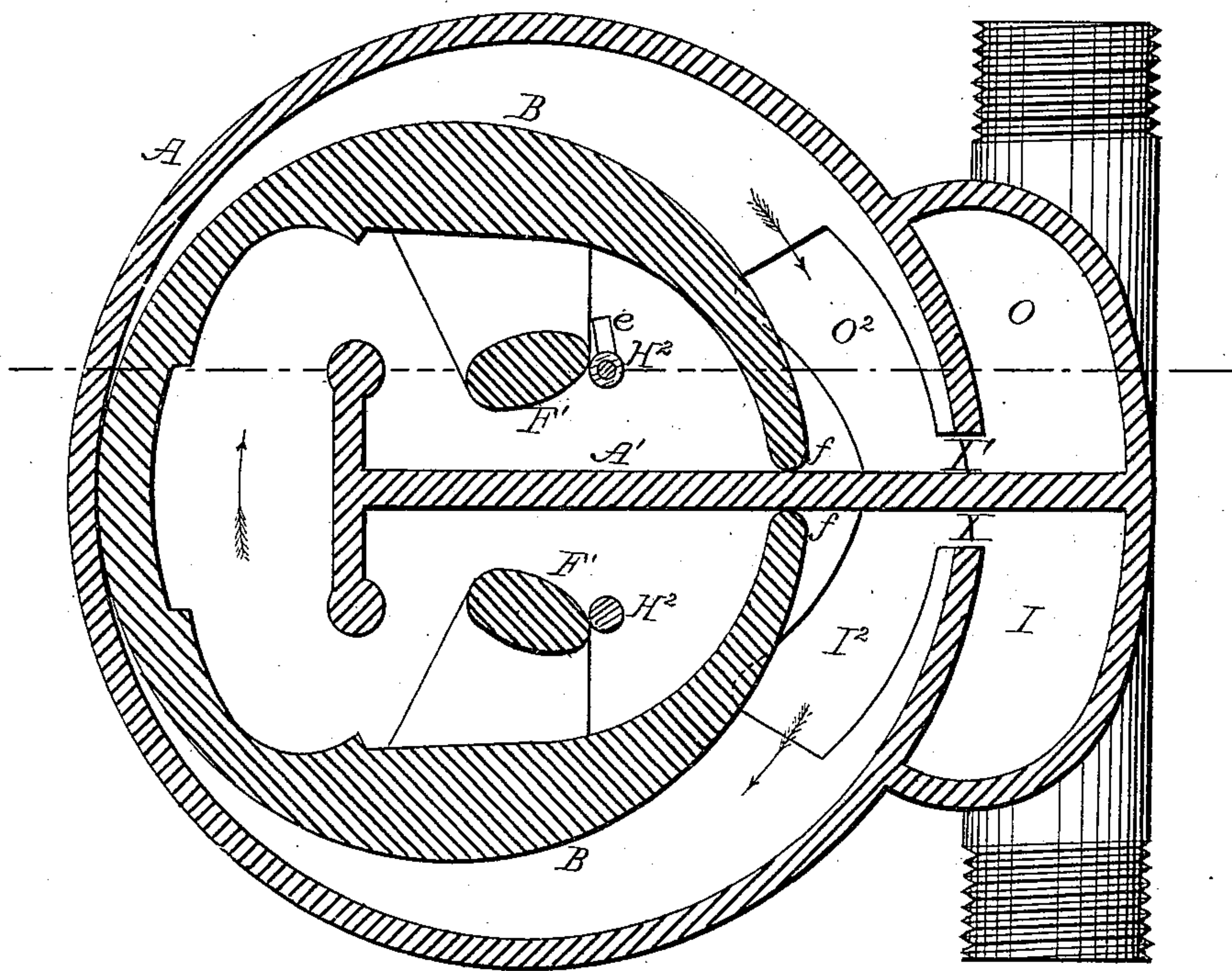
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*Fig. 4.*



*Fig. 5.*



Witnesses:

*J. C. Brecht,*  
*Howell Bartle*

Inventor:

*Lewis Halliok Nash*  
*by Johnson & Johnson*  
Attorneys



# UNITED STATES PATENT OFFICE.

LEWIS HALLOCK NASH, OF BROOKLYN, ASSIGNOR TO THE NATIONAL  
METER COMPANY, OF NEW YORK, N. Y.

## OSCILLATING METER.

SPECIFICATION forming part of Letters Patent No. 300,627, dated June 17, 1884.

Application filed December 18, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS HALLOCK NASH, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Rotary Water-Meters, of which the following is a specification.

Steam-engines have been constructed upon the plan of an eccentrically-moving piston, adapted to rock upon a radial abutment within an inclosing-case to divide said case into receiving and discharging spaces, the center of the piston describing a circle around the center of the case. A piston adapted to have such a movement I use in my improved water-meter; and the objects of my improvement are to simplify the construction and perfect the operation of the meter, to effect accuracy of measurement of the water, and to produce a meter in which the eccentrically-moving piston operates without a dead-center, and thus obtain the advantage of a uniform movement.

In another application, Serial No. 114,916, for a patent for a water-meter, filed by me of even date herewith, I have described and claimed an eccentrically-moving piston, open from end to end, having a longitudinal side slot, an inclosing-case having a radial abutment extending from head to head of the cylinder, having an enlarged end extending through and forming a joint within the piston in every position of the latter, while said piston forms a joint with the case, and suitable means for registering the movements of the piston; and I do not claim herein, broadly, such a thing, nor any combination of devices or matter shown and described in my said application.

The specific matter of improvement herein consists in a novel means for controlling the eccentric movements of the piston in connection with a case-dividing abutment, dividing also the interior of the piston, whereby to effect a division of the inclosing-case and of the interior of the piston into receiving and discharging spaces for the water.

My improvement also embraces matters of construction and of combinations, which will be made the subject of specific claims.

Referring to the accompanying drawings, Figure 1 represents a vertical central section

of a water-meter embracing my improvements; Fig. 2, a horizontal section of the same, taken on the line  $xx$  of Fig. 1; Fig. 3, a similar section showing a modification; Fig. 4, a vertical section showing another modification, and Fig. 5 a horizontal section of the same.

The cylinder or case A has one head cast with it, while the other one is removable, and at one side an enlargement or extension chamber forming the inlet or outlet passages I and O. These passages communicate by a branch passage leading to each end of the cylinder, and by means of the inlet-ports  $I'$   $I''$  and outlet-ports  $O'$   $O''$ , located in the cylinder-heads with the interior of the cylinder. The abutment  $A'$  extends radially into the piston from one cylinder-head to the other, and terminates in an enlargement within the open piston to form a joint therewith, while the eccentrically-moving piston forms a joint with the case. The piston B is open from one end to the other, and has at one side a longitudinal slot,  $f$ , which bears with its sides against the opposite sides of the abutment and forms a guide and water-joint upon it. The piston is controlled in its eccentric movements by an elliptical or oval recess or groove,  $h'$   $h''$ , on each end thereof, and pins  $H^1$   $H^2$ , secured in the heads of the cylinder, and by them the piston is guided. The oval recesses are made slightly tapering in cross-section, and the pins  $H^2$ , of corresponding shape, fit snugly into them, so that they can be tightened to take up the wear in the grooves of the piston. One of these pins,  $H^2$ , is hollow, and receives a spindle having at its inner end a crank or arm,  $e$ , which bears upon the side of the wall of the oval recess  $h'$  as the piston moves. On the outer end of said spindle is secured a pinion,  $b$ , which meshes with a gear-wheel,  $a$ , on the shaft  $d$ . This shaft is journaled with one end in the cylinder-head, while its other end is supported in a stuffing-box,  $c$ , on an auxiliary head or plate, D, which forms, with the head C, a chamber in which the gearing  $ab$  is placed and inclosed. The internal surface of the piston and the enlarged end of the abutment may be of any form that will make a dividing joint within the interior of the piston. The contact of the piston and abutment may be



maintained during the entire movements of the piston, or at intervals in its movements, while the contact of the piston with the cylinder must be constant. The dividing joint within the piston is formed by a cylindrical enlargement, *g*, of the radial abutment, and a central circular wall, *i*, adapted to form the joint during the return movement of the piston, as shown in Fig. 2, while in Fig. 3 the interior of the piston has two oppositely-projecting points, *i'*, and the abutment has two bearing-points, *g*, adapted to make contact with the interior wall of the piston from one projecting point to the other during the entire movement of the piston, in which movement one of the bearing-points of the abutment always has such contact with the piston.

In Figs. 1 and 2 I have shown the means for controlling the eccentric movements of the open piston as connecting therewith out of center with the case, and consisting of an oval groove or recess or projection, *F'*, which may be formed in one or both ends of the piston to receive the controlling action of pins fixed in the head or heads of the case. In Figs. 4 and 5 I have shown modifications of this controlling device, in which the fixed case-pins are placed in another position eccentric to the center of the case, and the oval bearing of the piston changed in position to co-operate with the pins precisely as in Fig. 2. In Fig. 4 the core of the oval recess in Fig. 2 is supported by arms extending from the inner wall of the piston, within its interior opening, in position to allow the crank-arm *e* of the pin *H*<sup>2</sup> to be driven by contact with the oval core, as in Fig. 2. I may use such a controlling device on each side of the radial abutment, but one will give effective controlling action; and the case-pins may be arranged in the top or in the bottom head, the relative positions of the pins and of the oval cores being such as to maintain the joint forming contact of the piston with the case, while the conformation of the interior wall of the piston and the form of the enlargement of the radial abutment are such as to maintain a dividing-joint within the interior of the piston at certain portions only of its eccentric movements. The path of the piston-controlling device is of a form adapted to maintain a cylindrical form of piston in contact with a cylindrical form of case; but a change in the form of the piston-controlling device would

require a change in the form of the piston and of the case, or of both.

The operation is as follows: The water enters through the inlet - passage I X and passes through the branch passages to the inlet-ports I' I<sup>2</sup>, and, pressing against the external surface of the piston B, forces it in the direction of the arrow, the water on the opposite side of the piston meanwhile passing out through the ports O' O<sup>2</sup> to the passage X' O. The inlet and the outlet ports are increased in their capacity by the passages X X', formed in the wall of the case on each side of the abutment, and these passages communicate with the chamber of the case on each side of the abutment. When the piston takes the position shown by the dotted lines in Fig. 2, the water enters within the center of the piston, driving it in the same direction. At this position of the piston shown by dotted lines the abutment divides the interior of the piston into a receiving and discharging space, and consequently as the water enters the piston on one side of the abutment it is being discharged from the other, returning the piston to its former position.

I claim—

1. The combination, in a water-meter, of an inclosing-case having suitable inlet and outlet ports, an abutment, and one or more pins eccentrically placed in said case-heads, with an eccentrically-moving piston having a side slot and a projection out of its center, of a form adapted, in connection with the fixed pin, to control the motion of the piston, and suitable registering mechanism, substantially as described.

2. The combination, in a water-meter, of a piston having an oval groove or projection out of center in one or both of its ends, and a longitudinal side slot, with an inclosing-case having one or more pins, *H*<sup>2</sup> *H*<sup>2</sup>, placed out of center of said case, a shaft passing through one of said pins, having a crank-arm, a dividing-abutment, and suitable registering mechanism, substantially as described.

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

LEWIS HALLOCK NASH.

Witnesses:

A. E. H. JOHNSON.

J. W. HAMILTON JOHNSON.