(No Model.) 2 Sheets—Sheet 1.

L. H. NASH.

OSCILLATING METER.

No. 300,628. Patented June 17, 1884.

Fig. 1.

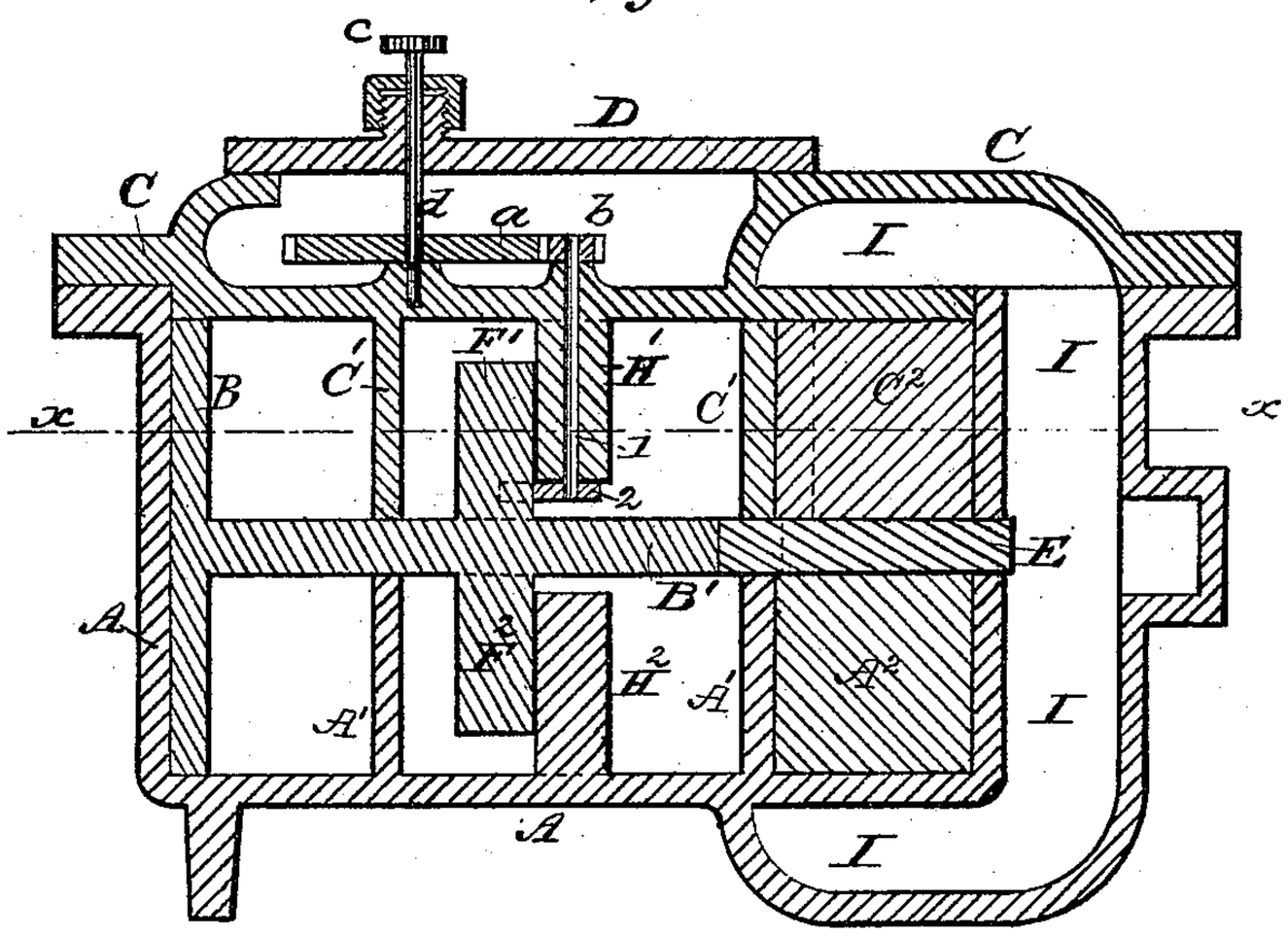
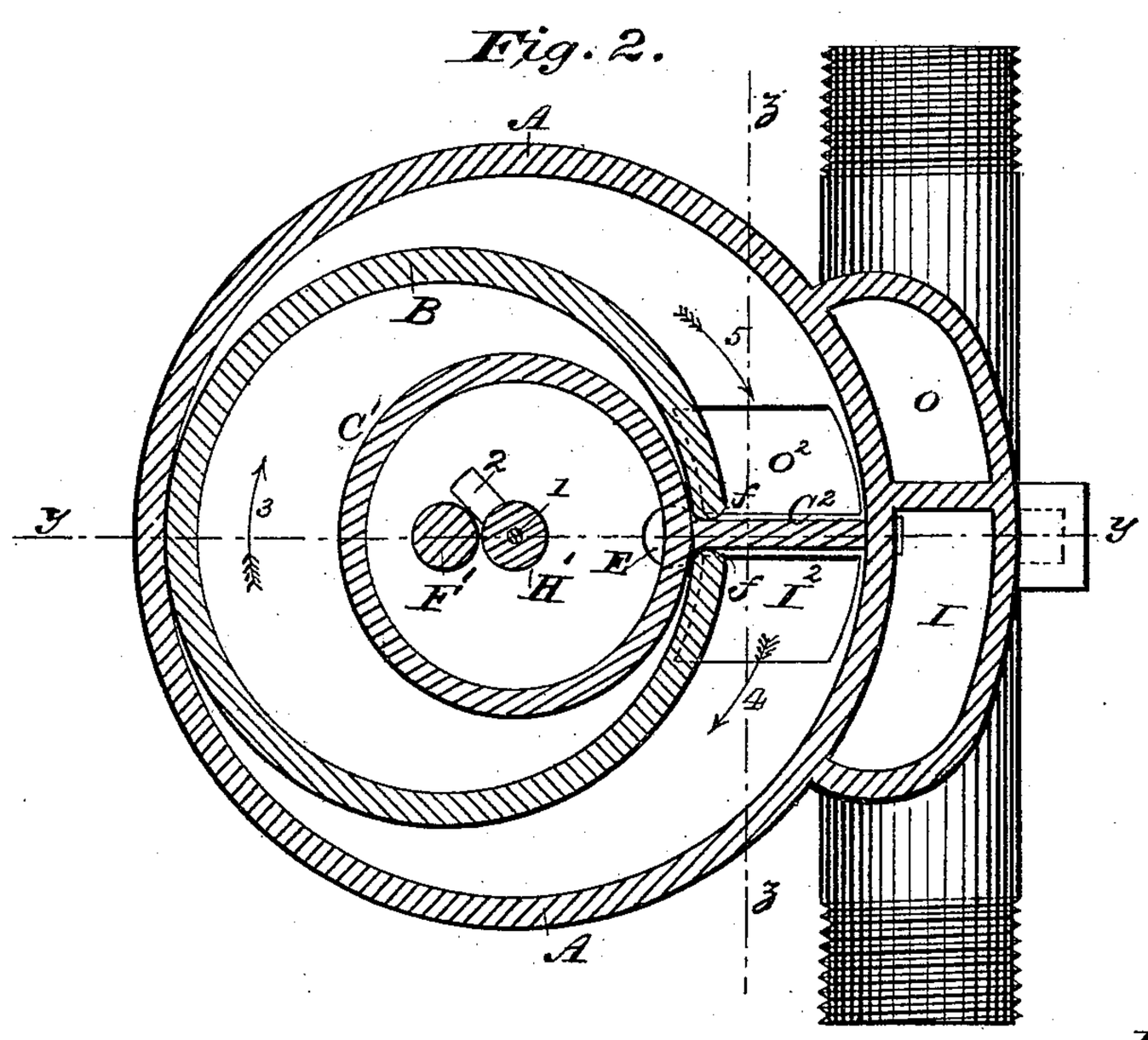


Fig. 2.



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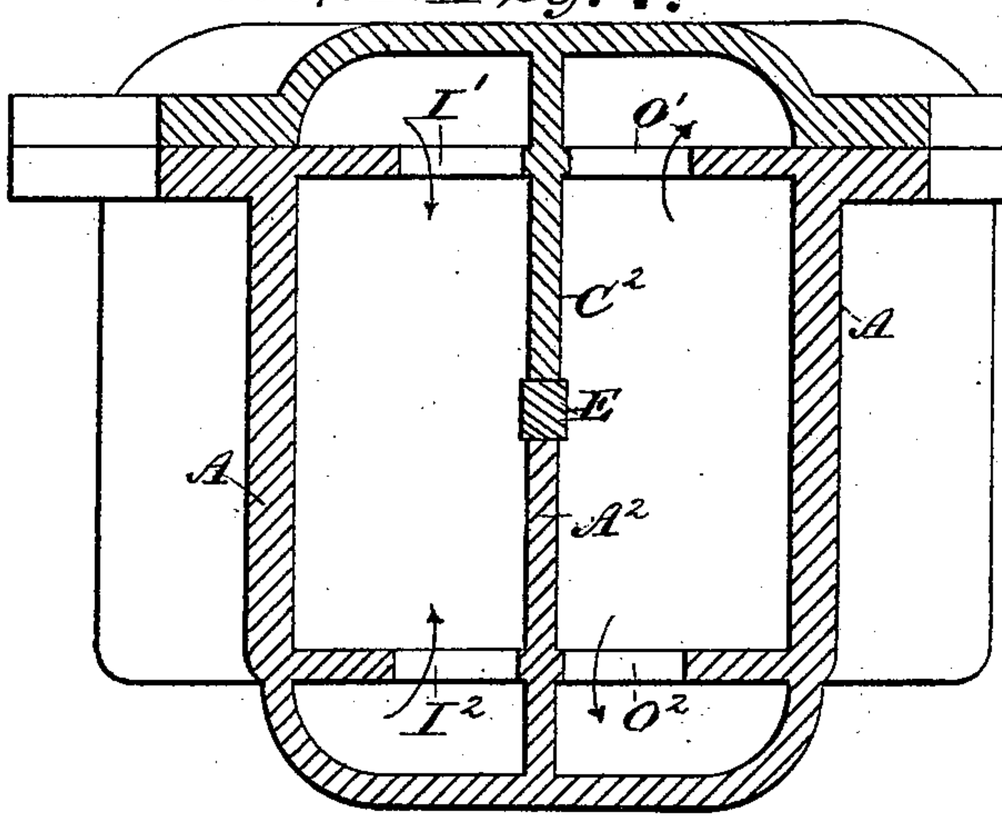
(No Model.) 2 Sheets—Sheet 2.

L. H. NASH.

OSCILLATING METER.

No. 300,628. Fig. 7. Patented June 17, 1884.



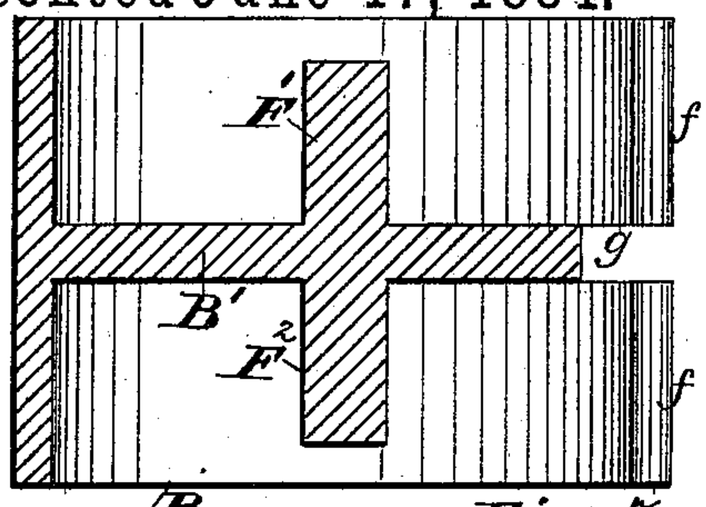


Fig. 5.

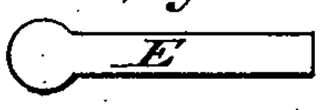


Fig. 6.

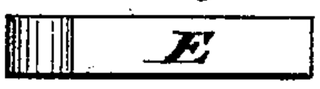


Fig. 5.

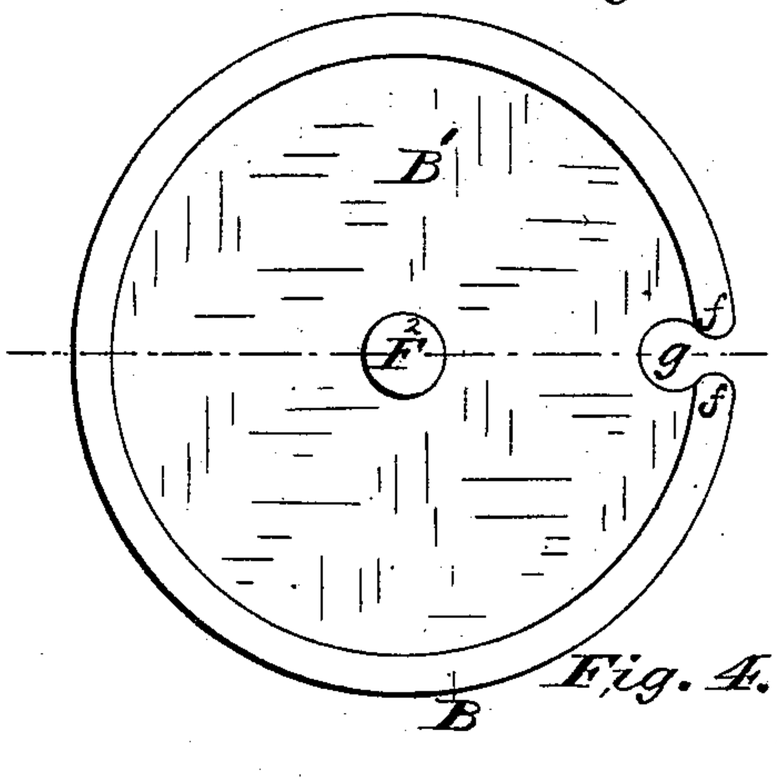
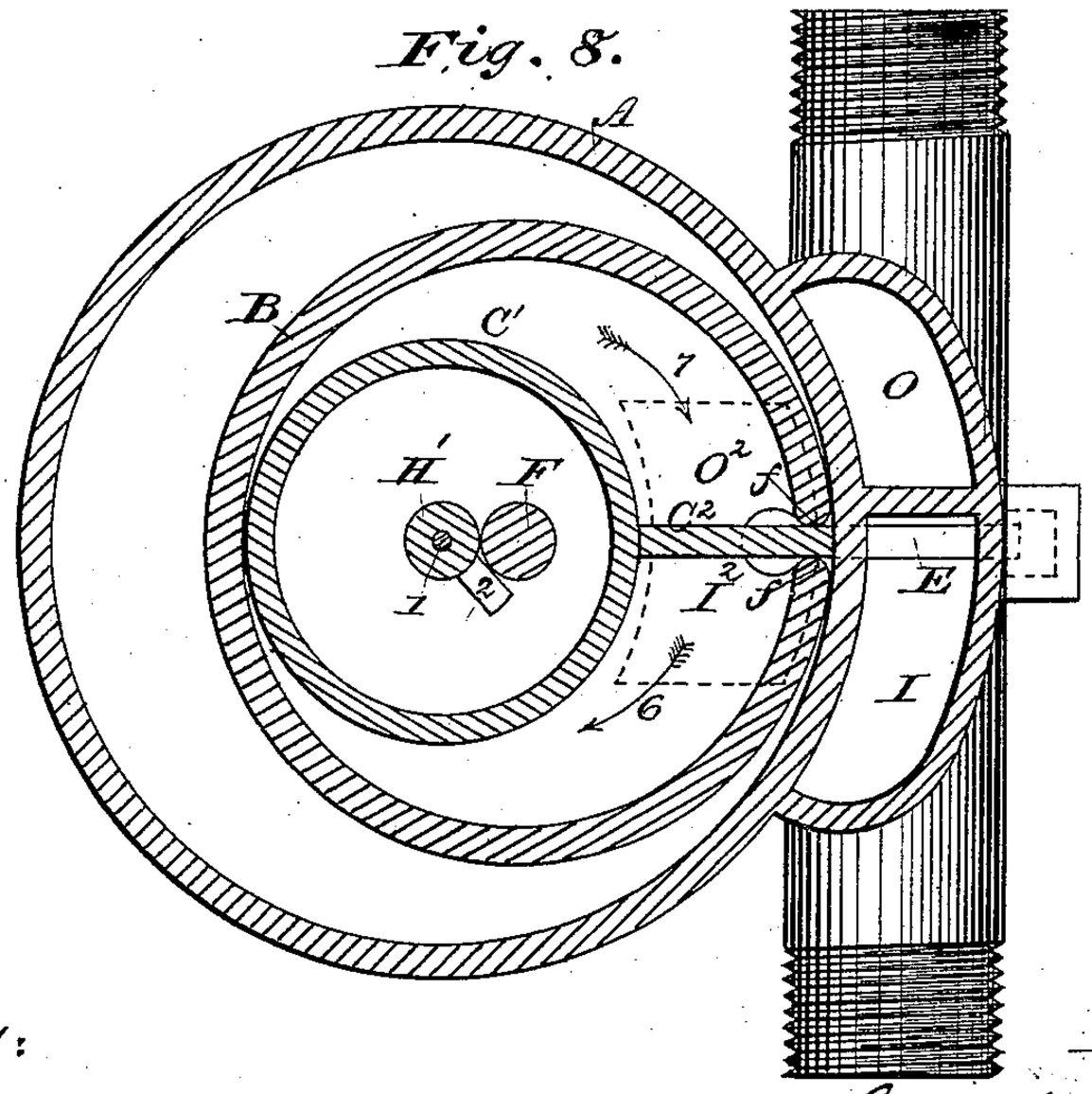


Fig. 4.

Fig. 8.



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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. 300,628, 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 with 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 motion I use in my improved water-meter; and my said improvements consist of matters of construction and of combinations, which will be made the subject of specific claims, and which will embrace novel means in a divided piston for controlling its motion.

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 certain means for controlling the eccentric movement of the piston, consisting of co-operating fixed studs on the case and studs of the piston; and I do not therefore broadly claim herein such means of controlling the path of the piston, nor any combination of devices or matter shown in my said application.

Referring to the accompanying drawings, Figure 1 represents a vertical section through the meter on the line *y y* of Fig. 2; Fig. 2, a horizontal section of the meter on the line *x x* of Fig. 1; Fig. 3, a section of the piston; Fig. 4, an end view of the same. Figs. 5 and 6 represent the movable division of the abutment; Fig. 7, a section on the line *z z* of Fig. 2, and Fig. 8 a section similar to Fig. 2, showing the piston in another position.

The meter-case A is cylindrical in form, and has a smaller cylindrical ring projection, A′, extending inward from the head of the case. The other head, C, which is removable, has a similar ring projection, C′, corresponding with A′, and both form a joint with their ends upon the dividing web-piece B′ of the piston B. Within both of these ring projections is placed a central stud, H′ and H², extending from the case nearly to the web-piece of the piston. The piston B consists of a cylinder divided transversely by a web, B′, while at one side it is provided with a longitudinal slot, *g*. The piston has two studs, F′ and F², similar to those on the case, around which, and in contact therewith, said piston-studs revolve, and thus maintain a close contact of the piston with the inner side of the case. The case has two abutments, A² and C², secured to it, adapted to form a joint between the case A and the central ring projections, A′ and C′, also upon the piston B at the points *f f*, as well as upon the movable division-abutment E. This abutment E extends within the case and terminates in a cylindrical end, which fits into a corresponding recess of the slot *g* in the piston, so that the latter can move thereon. The movable abutment moves radially through an opening in the inner wall of the case as the piston moves, and forms the joint sidewise between the fixed abutments A′ and C′. At one side of the case is arranged the inlet-passage I, which conveys the water to the inlet-ports I′ and I², and it is discharged through the ports O′ and O² and passage O. The inlet and outlet passages are divided by the radial abutment.

In the stud H′ of the cap C is journaled a shaft, 1, having at one end a crank-arm, 2, while the other end projects through the cover C, and is fitted with a pinion, *b*, which meshes with a gear-wheel, *a*, on the shaft *d*. This shaft is journaled at one end in the cover C, while its other end passes through a stuffing-box on the auxiliary cover or plate D, and is provided on its outer end with a suitable gear-wheel, *c*, meshing with proper gearing on a registering apparatus, by which the revolutions of the piston are indicated.

The operation is as follows: The piston B, being in the position shown in Fig. 2, forms a joint upon the meter-case and the central cylindrical projections, A′ and C′, while the interior movable abutment, E, forms the joint between the fixed abutments A² and C² and the piston-web. The inflowing water will then force the piston B in the direction of the arrow by pressing against its exterior in the direction of the arrow 4, at the same time discharging the water in the direction of the ar-

row 5 through the ports O′ and O². When the piston has moved to the position shown in Fig. 8, the water will enter on the inside of the piston, as shown by the arrow 6, and force it in the same direction as the arrow, while the water discharges in the direction of the arrow 7 through the ports O′ and O². It will be seen that the studs F′ F² on the piston dividing-plate revolve around and in contact with the studs H′ and H² of the case. The crank 2 on the shaft 1 is moved or pushed forward by the stud F′, and the revolutions will be indicated by the intermediate gearing to the registering apparatus, which is not shown.

I have described the piston as being guided in its movement by the contact of the studs. The movements of the piston are measured by the co-operating action of the crank-arm 2 with said piston; but it is obvious that the movement of the piston might be controlled by a direct crank-connection with the shaft 1 without the studs F′ F², in which case the joint contact of the piston with the case would be maintained in the same manner and the registration effected through the gears *b* and *a* in the same manner.

In order to secure a more perfect control of the movement of the piston, I may hold the parts F′ and H′ in contact by a loop embracing them.

I have shown and described the meter as having an eccentrically-moving piston constructed in such manner as to divide the case into upper and lower compartments, and which give the advantage of balancing the piston in its movements; but it is obvious that the meter may be constructed with one of these compartments, the functions and co-operation of all the parts being the same.

I claim—

1. The combination, in a water-meter, of an eccentrically-moving piston having a transverse dividing plate or web, B′, and a longitudinal slot, *f f*, at its side, an inclosing-case having radial abutments C² A² and concentric ring projections C′ A′, and an interior movable abutment, E, with a shaft having a bearing within the case driven by the piston, and a train of speed-reducing gearing connected with said shaft, substantially as described, for the purpose specified.

2. The combination, in a water-meter, of an eccentrically-moving piston having a transverse dividing plate or web, B′, a longitudinal side slot, and a centrally-projecting stud or studs, F′ F², with an inclosing-case having dividing-abutments, center ring projections, and an interior projecting stud or studs, H′ H², and means, substantially such as described, supported by the case-stud, whereby the motion of the piston is communicated to the registering mechanism.

3. The combination, in a water-meter, of the case A, having the interior concentric cylindrical ring projections C′ A′, the central projecting studs, H′ H², and the fixed abutments C² A², dividing the inflow from the outflow, with the movable joint forming abutment E, arranged within the case, and an eccentrically-moving cylindrical piston having a transverse dividing plate or web, B′, a longitudinal slot, *g*, in its outer surface, and having its joint-forming bearing maintained by the contact of the projecting studs of the piston and case, substantially as described.

4. The combination of the inclosing-case having a removable cap formed with a depending hollow stud, H′, with an eccentrically-moving piston having a transverse web, B′, formed with a central stud, F′, the crank-shaft 1 2, having its bearing within the said case-stud, and the interior speed-reducing gearing, substantially as herein set forth.

5. The rotary water-meter herein described, consisting of the case A, having inlet and outlet ports, interior concentric projections, A′ C′, interior central studs, H′ H², and fixed abutments C² A², the interior movable joint-forming abutment E, the eccentrically-moving piston having the transverse web B′, the central studs, F′ F², and the longitudinal slot *g* in its outer surface, and the crank-shaft 1 2, supported by said case-stud, and operated by the piston, all constructed and arranged for operation substantially as described.

6. The combination of an eccentrically-moving piston having a longitudinal side slot and a transverse dividing-web, with means for connecting the latter with fixed means for controlling the movements of the piston, and an inclosing-case having a fixed interior abutment extending from each head to said web, having a form adapted to make a joint with the interior walls and with the web of said piston, substantially as described.

7. A meter-case having fixed ring projections C′ A′, and a fixed radial abutment having a movable section, E, combined with an eccentrically-moving piston having a transverse dividing-web, a longitudinal side slot, and means, substantially such as described, carried by said piston-web, for controlling the movements of the piston.

8. The combination, in an oscillating water-meter, of a ring-piston having a transverse dividing-web, with an inclosing-case having ring projections, and a radial abutment with which the piston is adapted to co-operate, to divide its interior and to form a joint with both sides of its web, and means having a fixed relation to the case connecting with the piston-web for controlling the motion of the piston, substantially as described, for the purpose specified.

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.