No. 615,392. Patented Dec. 6, 1898.

J. C. KELLEY.

PISTON OF NUTATING PISTON METERS.

(Application filed May 24, 1895.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1

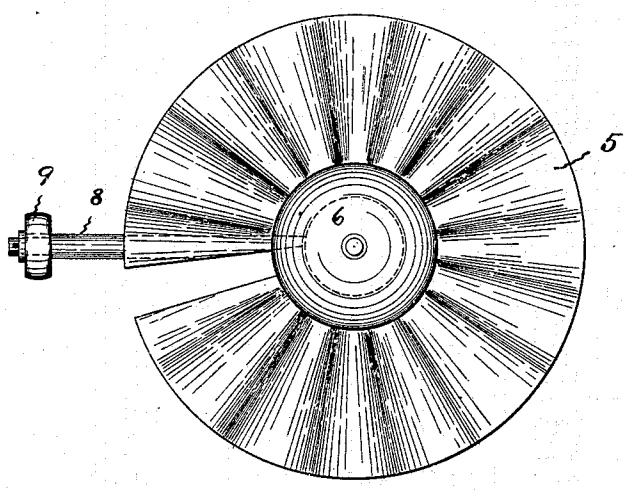


Fig. 2

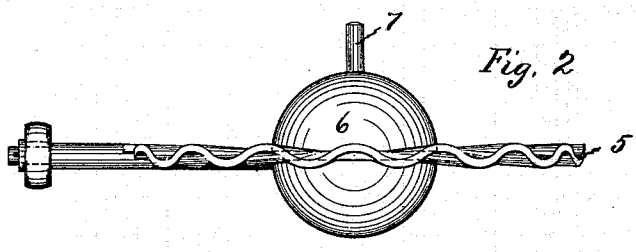
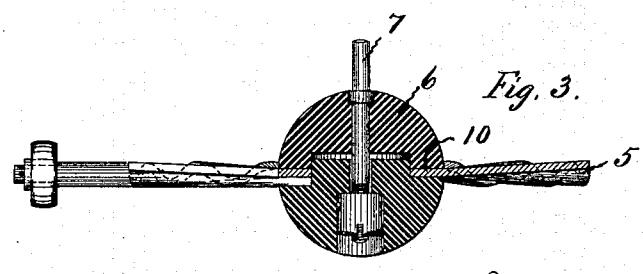


Fig. 3.



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Fig. 4

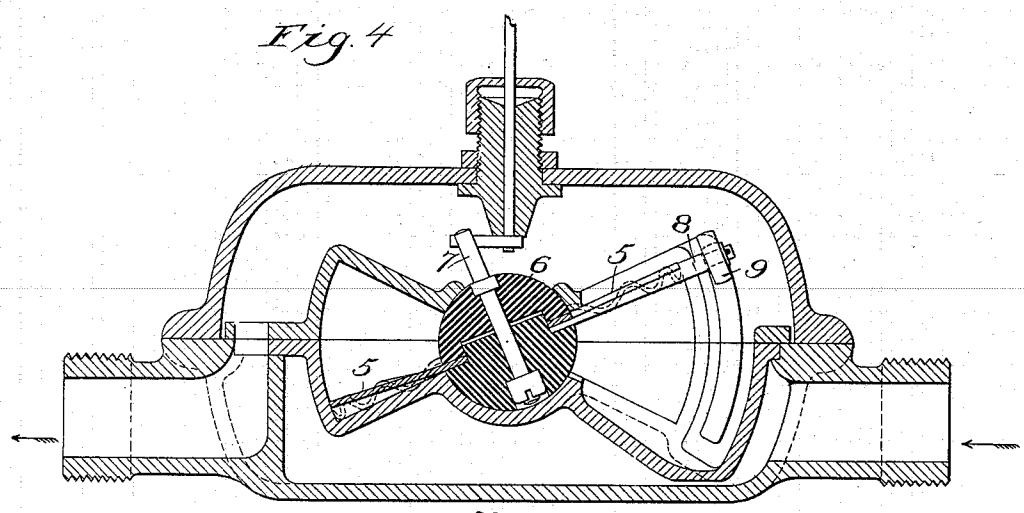
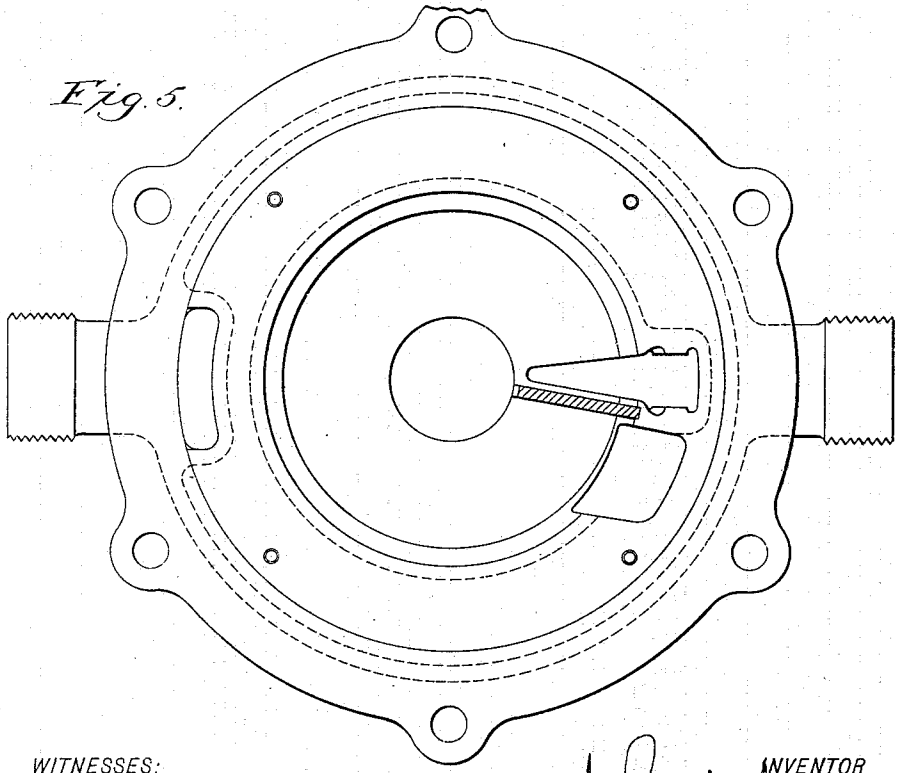


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN C. KELLEY, OF NEW YORK, N. Y.

PISTON OF NUTATING-PISTON METERS.

SPECIFICATION forming part of Letters Patent No. 615,392, dated December 6, 1898.

Application filed May 24, 1895. Serial No. 550,523. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. KELLEY, a citizen of the United States, and a resident of New York, (Brooklyn,) in the county of Kings and State of New York, have invented certain new and useful Improvements in Pistons of Nutating-Piston Meters, of which the following is a specification.

My present invention relates to the piston of a nutating-piston meter; and it consists of certain novel parts and combinations of parts particularly pointed out in the claims concluding this specification.

In the drawings I have shown my invention embodied in the form which I at present prefer; but it will be understood that various modifications and changes may be made without departing from the spirit of my invention and without exceeding the scope of the concluding claims.

Figure 1 is a plan of a disk piston. Fig. 2 is a side view of the same, and Fig. 3 is a sectional view of the piston shown in Figs. 1 and 2. Fig. 4 shows a vertical section of the piston and case, and Fig. 5 shows the port-section in top view.

The following is a description of the structure shown in the drawings.

The piston is formed of any suitable material, but preferably of metal.

Nutating-pistons heretofore formed have had plain surfaces, either disk-shaped or conical. My improved piston has a surface composed of radial undulations or flutings, as clearly shown in the drawings. These corrugations or ribs need not be literally radial, as some latitude in this respect is permissible. Instead of the piston being disk-shaped it may of course be conical and fluted in substantially the same manner. It is not necessary that the irregular surface be undulating or fluted, as it might, for example, have radial surface ribs projecting from a plain body, or it might be reflexed angularly instead of in curved lines. I prefer the form shown, because it is easy to manufacture and combines at the same time lightness and strength. The material of which the piston is made is, as I have said, preferably metal—such, for example, as bronze or other non-corrosive metal. It might be made of either a corrosive or a non-corrosive metal suitably plated or coated on the exterior surfaces with a non-corrosive material.

As far as I am aware the cone surfaces or heads of the chamber in which all nutating-pistons have heretofore operated have corresponded substantially to the surface conformation of the piston adapted for use in connection therewith. The piston above described is, on the other hand, adapted and designed to be used in connection with a case the heads of which are relatively plain surfaces—that is, do not correspond substantially to the surface conformation of the piston adapted for use in connection therewith. The corrugations on the piston being arranged in a radial direction, the requisite joint-forming contacts between the piston and the heads of the case are formed as the piston nutates, and these radial corrugations are intended to be near enough together to substantially preserve a continuous contact, or, in other words, to prevent any considerable flow of water through the meter without registration. Hence the accuracy of the device will not be substantially affected.

5 is the radially-corrugated disk of the piston; 6, its ball-bearing, preferably made of hard rubber; 7, the spindle for driving the registering mechanism, and 8 the rod extending from within the ball of the piston outwardly, provided with a roller 9 at or near its extremity, which makes contact with a bearing-surface to relieve the bridge of wear. I do not claim the employment of such a rod and roller with such function, as I am not the inventor thereof.

Referring to Fig. 3, it will be seen that the radial corrugations end at the surface of the ball-bearing and that there is a flat angular section 10 of the disk, which is clamped between the opposite sections of the ball-bearing. While this feature is by no means essential, I prefer that it be so made.

In Figs. 4 and 5 I have shown a suitable case for the piston to work in; but as suitable cases are now well known in the art a specific description thereof is not regarded as necessary here.

In the foregoing specification I have referred to some of the modifications which might be adopted in practicing my invention; but it will be understood that various other

modifications might be employed without departing from the spirit of my invention and without exceeding the scope of the concluding claims and that mention by me of a few modifications is not intended to exclude others not referred to.

Many of the details above described are not essential to the various features of my invention. This will be indicated in the concluding claims, where the omission of an element or the omission of reference to the detail features of the elements mentioned is intended to be a formal declaration of the fact that the omitted elements or features are not essential to the inventions therein severally covered.

What I claim is—

1. In a nutating-piston water-meter the combination with head-plates having relatively plain surfaces of a piston having an unyielding irregular surface.

2. In a nutating-piston water-meter, the combination with head-plates having relatively plain surfaces, of a piston having an unyielding irregular surface with lines of contact substantially radial at intervals.

3. In a nutating-piston water-meter, the combination with heads having relatively plain surfaces of a piston made of corrugated metal.

4. The piston of a water-meter consisting of the combination of a ball and a disk having lines of contact substantially radial at intervals formed of metal integral with the body of the piston and provided with a plain surface where it projects into the interior of said ball.

5. In a nutating-piston water-meter, the combination with stationary heads in the measuring-chamber of a piston having a corrugated surface.

JOHN C. KELLEY.

Witnesses:
FRANK VINTEN,
FRANK L. PLATT.