(No Model.) 3 Sheets—Sheet 1.

J. A. TILDEN.

DISK WATER METER.

No. 486,992. Patented Nov. 29, 1892.

Fig. 1.

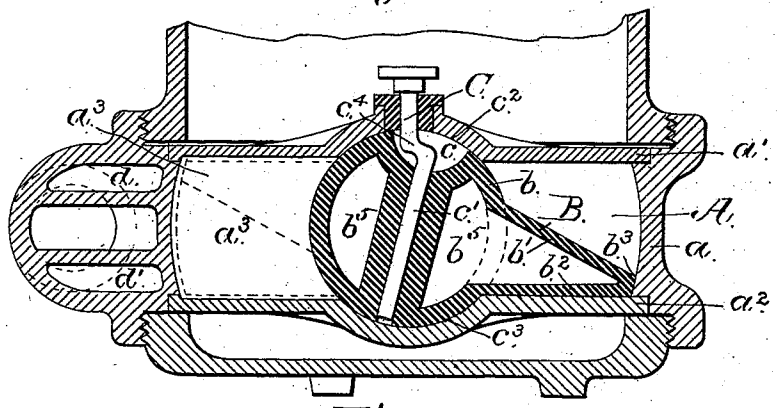
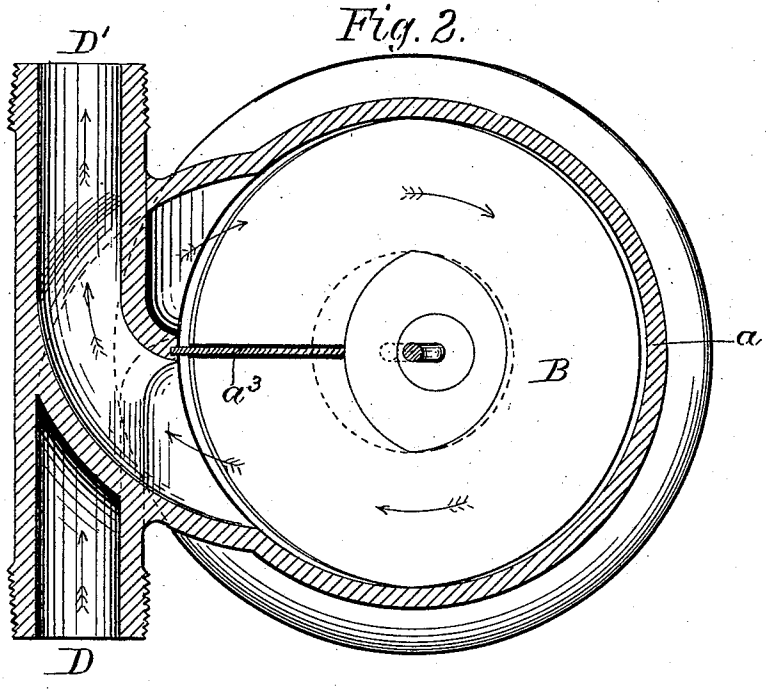


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 3.

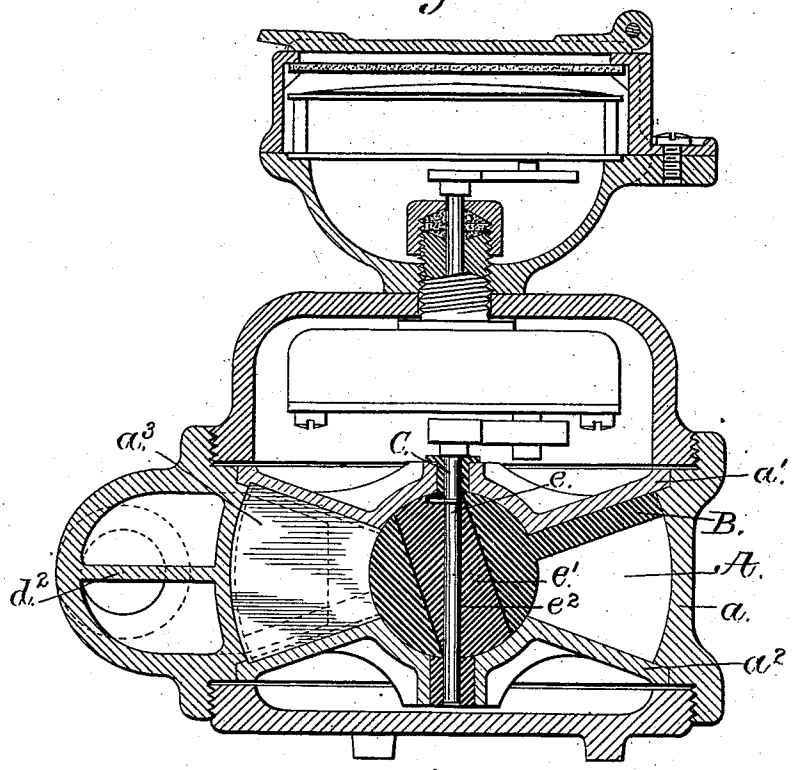
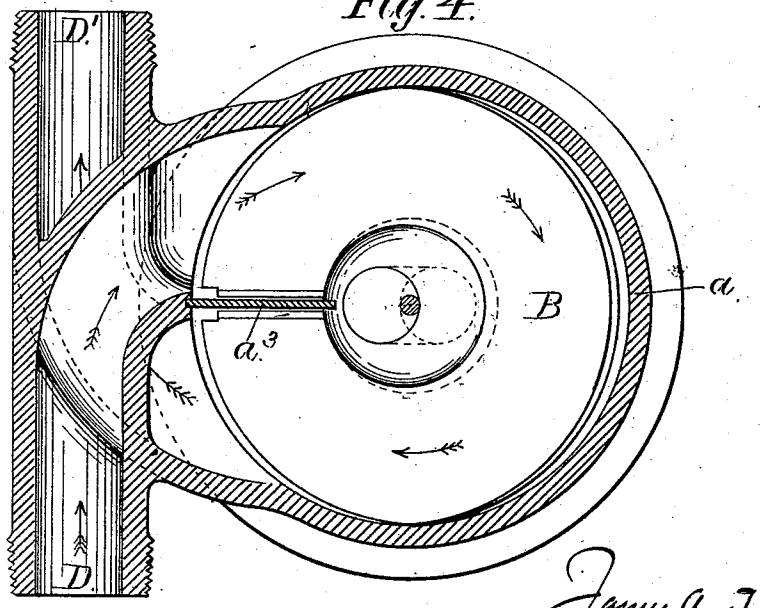


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

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DISK WATER METER.

No. 486,992. Patented Nov. 29, 1892.

Fig. 5.

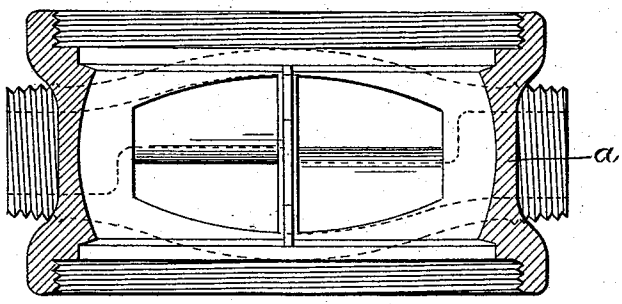


Fig. 6.

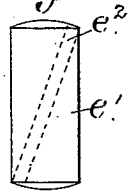


Fig. 7.

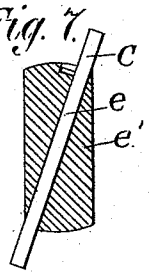


Fig. 8.

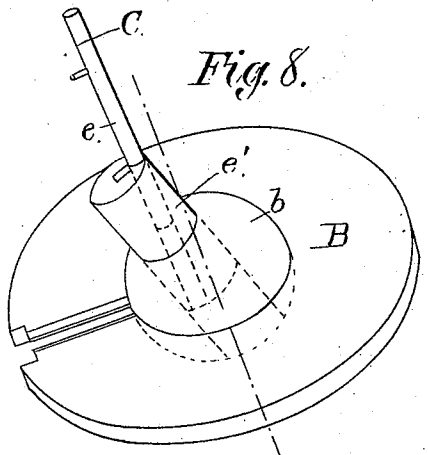
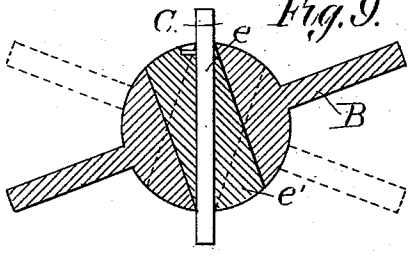


Fig. 9.



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UNITED STATES PATENT OFFICE.

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DISK WATER-METER.

SPECIFICATION forming part of Letters Patent No. 486,992, dated November 29, 1892.

Application filed July 20, 1891. Serial No. 400,189. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. TILDEN, a citizen of the United States, residing at Hyde Park, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Water-Meters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The improvement relates to the following-described improvements in disk meters, and especially to the form of the disk chamber and disk, to the arrangement of the water inlet and outlet, and to the manner of controlling the disk and transmitting its action.

In the drawings, Figure 1 is a view in vertical section of a portion of the meter-case and piston. Fig. 2 is a view in section of the meter-case, showing the relation of the passages to the disk or measuring chamber, and also showing in plan the disk and its crank. Fig. 3 is a view in vertical section illustrating a slight modification in the form of the measuring-chamber inlet and outlet passages and also of the crank. Fig. 4 is a view in horizontal section through the case upon the line of one water-passage, also showing in plan the disk. Fig. 5 is a view in section through a case having the inlet and outlet passages shown in Fig. 4 and looking toward said passages. Figs. 6 and 7 are detail views of a portion of the crank mechanism shown in Fig. 3. Fig. 8 is a view in perspective of the disk with the form of crank represented in Fig. 3, the parts not being united. Fig. 9 is a view in section and dotted outline of the disk and crank of the kind represented in Fig. 3 to illustrate the operation of the crank.

Referring to the drawings, A represents the disk or measuring chamber. It is formed in the case a between the parallel plates a' a^2. It is partly divided by the vertical diaphragm or partition a^3 and it contains the disk B. This disk (see Fig. 1) has a central sphere or ball b and inclined surfaces b' b^2, extending to its outer edge b^3. It is preferably made of hard rubber and is hollow or provided with the cavity b^5. At the upper end of the ball there is a cavity or recess c, from which extends through the ball centrally the hole c'. Sections of the ball extend into cup-recesses c^2 c^3 in the upper and lower plates a' a^2, respectively. A crank C extends through a stuffing-box or bearing in the plate a' into the recess c, where it is offset at c^4, and from the offset it extends diagonally downward through the axial hole c' in the ball to or very near the end of the hole and considerably across a central line drawn from the center of the upper part of the crank through the center of the ball. The effect of this construction of crank and ball is as follows: First. It communicates movement from the gyratory disk to the registering mechanism. Second. It holds the disk in its proper contacts during its gyration and relieves its bearings from undue or undesirable extent of friction. In other words, it keeps it up to its work. Third. It prevents end-thrust of the disk, or, in other words, the extension of the crank-shaft axially through or almost through the disk when the axis has a gyratory path, suspends or holds the disk practically balanced in said path, the tendency to the development of an end-thrust in either direction being neutralized by extending the shaft past the center through or very nearly through the ball or disk.

The case, as represented in Figs. 1 and 2, it will be seen, is of the same height throughout—that is, it has parallel upper and lower surfaces or plates, it is circular in section, and the vertical edges are curved.

The water inlet D and outlet D′ are arranged in relation to the diaphragm a^3, disk chamber, and case so as to provide a continuous circulation or unobstructed rotary movement of the water from the inlet through the meter to the outlet. This is accomplished by arranging the inlet and outlet so that they are transposed in relation to each other from the positions which they usually occupy in this class of meter. This of course necessitates that the inlet and outlet passages cross each other, and it produces an inlet so disposed to the path of water in the disk chamber that the flow of water from the inlet through the chamber is upon a continuous uninterrupted or unobstructed circular path, and the relation of the outlet to the path of

the water is the same, the water being free to leave the disk chamber in a circular or rotary path and without obstruction.

It will be understood, of course, that with the old arrangement of inlet and outlet the water is directed by the inlet against the diaphragm a^3 and is obstructed by it and that the same is true with regard to the outlet—that the water is forced against the diaphragm and deflected by it—and that by this new arrangement of the inlet and outlet the obstruction by the diaphragm is entirely done away with and the easiest path selected for the passage of the water from the water-main through the disk chamber to the main again. To obtain this result, it is necessary that the case should be cast or formed either as represented in Figs. 1 and 2 or as in Figs. 3 and 4, Figs. 1 and 2 showing the inlet D as crossing over and under the outlet D′ in passages d d', while in Fig. 3 the inlet-passage is represented as above and the outlet-passage as below the diaphragm d^2. I prefer the construction represented in Figs. 1 and 2 as producing a better application of water-currents to the disk. In Figs. 3 and 4 a somewhat different form of disk and of the disk chamber is represented, and also a modified form of the crank C. The crank in this construction, instead of being in one piece, comprises the vertical shaft e, which passes through a stuffing-box or bearing in the upper plate and diagonally through an inclined cylindrical bearing e' of comparatively-large diameter. This bearing-piece is secured to the shaft to rotate with it, but is inclined to the axis of the shaft, and it is contained in a hole e^3, extending across the ball of the disk. The shaft e preferably extends into a step or bearing in the lower plate; but the effect of the eccentric or inclined bearing and straight shaft in regard to the transmitting of the motion of the disk and in regard to holding it to its work is the same as that of the shaft and crank C.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a water-meter, the combination of the disk or measuring chamber, the diaphragm or division-plate a^3, a gyrating disk, a water-inlet curved toward the diaphragm or partition a^3, and a curved water-outlet upon the opposite side of the partition-plate, as and for the purposes described.

2. A water-meter case having a measuring or disk chamber, a water-inlet in two sections or parts, and a water-outlet crossing the two sections or parts of the water-inlet, as and for the purposes described.

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