A. BOCKLET.
Water-Meter.

No. 226,023 Patented Mar. 30, 1880.

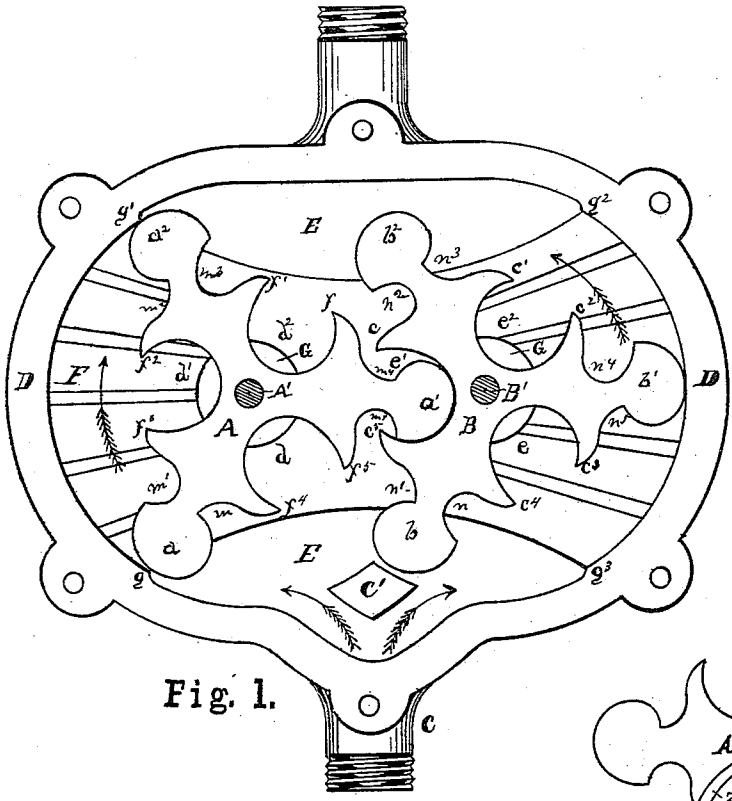


Fig. 1.

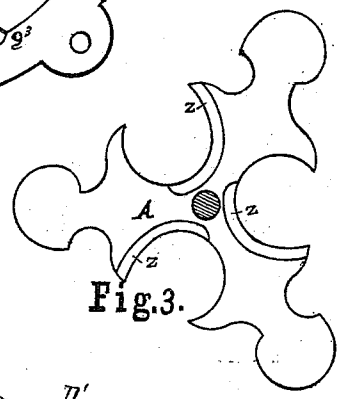


Fig. 3.

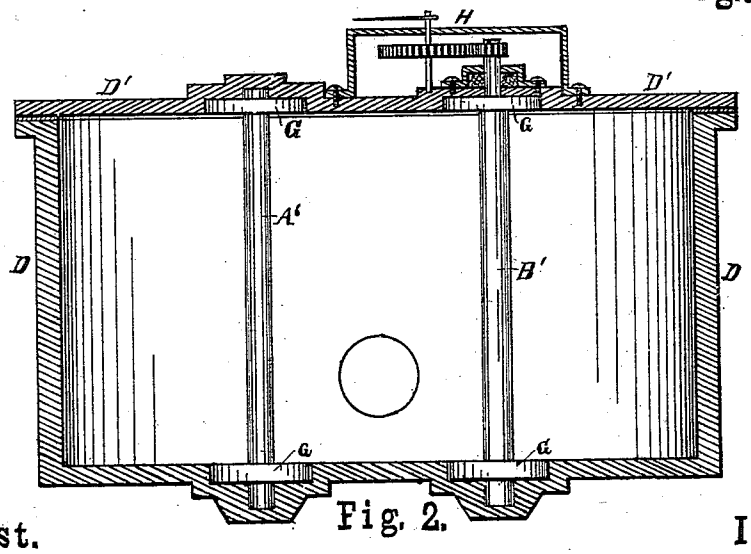


Fig. 2.

Attest.

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ALBERT BOCKLET, OF CINCINNATI, OHIO.

WATER-METER.

SPECIFICATION forming part of Letters Patent No. 226,023, dated March 30, 1880.

Application filed June 6, 1879.

To all whom it may concern:

Be it known that I, ALBERT BOCKLET, of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Water-Meters, of which the following is a specification.

Water-meters as ordinarily constructed require gear-wheels to keep the contact-surface of the pistons in their appropriate relative positions. One of the objects of my invention is to dispense with these gear-wheels, which it accomplishes by the peculiar construction of the pistons, to be hereinafter fully described.

In the drawings forming a part of this specification, Figure 1 is a plan view of the meter with the top removed, showing the relative positions of pistons as regards each other and the case. Fig. 2 is a central section through the meter, showing the manner in which the shafts of the pistons rotate in the top and bottom of the case, and also showing how an indicator may be attached to one of the pistons. Fig. 3 represents the bottom of one of the pistons, to show the grooves or channels, whose purpose will be hereinafter described.

A and B, Fig. 1, are two revolving pistons constructed in a form of my invention. These pistons are attached, respectively, to the shafts A′ and B′, or the shaft and piston may be cast solid, if preferred. Each of these pistons may have three or more heads. For description, I have selected the form having radial arms or buckets, each bucket having a circular head, a a' a^2 and b b' b^2, and projections f f' f^2 f^3 f^4 f^5 and c c' c^2 c^3 c^4 c^5 on either side, with corresponding depressions d d' d^2 and e e' e^2, to receive the heads a a' a^2 and b b' b^2, and depressions m m' m^2 m^3 m^4 m^5 and n n' n^2 n^3 n^4 n^5, to receive the projection f on the other as the pistons revolve.

In order that a better understanding of the form of these pistons may be had, I will describe their revolution and the points of contact with each other during revolution.

Starting with the position which the pistons occupy with relation to each other in Fig. 1, they are caused to revolve in the direction indicated by the arrows by the fluid which enters at the inlet-pipe C. As the column of fluid enters the meter it is caused to separate by the guide C′, which extends from bottom to top of the meter, and flow in the two directions indicated by the arrows. As the fluid comes in contact with the arms or wings of the pistons it causes them to revolve. The head a' of the piston A is shown in contact with the piston B in the depression e'. As the pistons revolve the point c comes in contact with the neck of the head a' and the point f comes in contact with the neck of the head b^2. On further revolution the head b^2 fits into the depression d^2. Continuing to revolve, the point f' comes in contact with the neck of the head b^2, and the point c' comes in contact with the neck of the head a^2. The head a^2 next falls into the depression e^2. The pistons have now each completed one-third of a revolution. The other two-thirds of the revolution is completed in a similar manner, points of contact being provided for each head and neck similar to those described for the first third of the revolution. Thus the points of contact are as follows: the point c^2 with the neck of the head a^2, the point f^2 with the neck of the head b^2, and the head b' with the depression d', the point f^3 with the neck of the head b', the point c^3 with the neck of the head a, and the head a with the depression e. This completes the second third of the revolution. The point c^4 now comes in contact with the neck of the head a, the point f^4 with the neck of the head b, and the head b with the depression d, the point f^5 with the neck of the head b, the point c^5 with the neck of the head a', and the head a' with the depression e', which completes one entire revolution of the pistons.

When the heads on one piston enter their corresponding depressions in the other, the head comes in contact with both sides of the depression before it reaches the bottom. A small quantity of fluid is thus inclosed between the head and the bottom of the depression, and would be retained there, and would tend to prevent the pistons from turning should there be no means provided for its escape. I therefore make grooves or channels in the bottom or top of each piston, (shown at z, Fig. 3,) through which this fluid escapes. These grooves also may be cast in the bottom or top. This, while describing the revolution of the pistons, also describes their form.

D is the case of the meter, the bottom and

sides of which are cast in one piece. D′ is the cover, which is secured to the case by bolts or otherwise. The heads of the pistons come in contact with the ends of the case for a distance of one-third of a circle whose center is coincident with the centers of the shafts A′ and B′. At the points g g' g^2 g^3 of the case depressions are formed in the case in order that, after the heads have passed, or before they have reached these points, the heads will not come in contact with the case, thereby lessening the friction.

Should it be preferred, instead of depressions, as shown in the drawings, the case may be gradually enlarged from the points g g' g^2 g^3, by which means the same object is attained.

The surfaces of the case between the points g and g' and g^2 g^3 are each one-third of a circle in order that one of the heads of each piston may always be in contact with the case, thus preventing the fluid from passing without turning the pistons.

As will be seen in Fig. 1, before the head a^2 passes the point g' the head a has reached the point g and the head b' the center of the space between g^2 and g^3. Should the case be so constructed that these spaces will be less than one-third of a circle, one head—as, for instance, a^2—will pass the point g' before the head a reaches the point g, and the fluid will pass between the piston and the case, and the meter will not measure accurately.

In the bottom and top of the case depressions E and grooves F are formed to collect the sediment that falls to the bottom of the case, not permitting it to collect and pack between the pistons.

To the shafts A′ B′, at each end of the pistons, I secure circular disks G, which turn, as the pistons revolve, in recesses cast in the top and bottom plates of the case for their reception.

In Fig. 2 H represents an indicator attached to one of the piston-shafts. Any desired form of indicator may be used in this connection.

Some of the advantages which I claim for my invention over meters as ordinarily constructed are as follows: By the peculiar form of construction of the pistons I do away with the extra gearing required for most meters, the pistons being so constructed as that they form their own gearing and are kept in their proper relative positions.

The corresponding depressions for the heads of the arms or buckets will extend far enough to keep in contact with the head of the arm of one piston until the head of the other comes in contact and forms a close joint with the depression of the other. For instance, head a' fits in depression e', as shown in Fig. 1; head a' moves with depression e' until head b^2 comes in contact with depression d^2. Projections f and c, which are formed by the ends or extension of the depressions e' and d^2, keep them in their proper relative position and force the head and depression to form a close joint as long as in contact by coming in contact with the necks of the heads m and n.

On one side of the depressions d d' d^2 and e e' e^2 the grooves or channels z are formed, starting at the points of the projection on the side that comes first in contact with the head, and extending about to the center of said depressions, Fig. 3.

If grooves in the top or bottom of the case are thought of advantage to be used to cooperate with the grooves or channels in the pistons, such grooves would start near the point where the head has passed the grooves z and cuts off the flow, and run toward the outlet-pipe.

I am aware that rotary engines have been constructed to operate without extra gearing; but heretofore, in order to so operate, the pistons have been so constructed as that but a small amount of space is left for the fluid passing through the meter, the pistons, when in position, occupying a very large portion of the caliber of the meter, while the pistons of my invention are so constructed as to occupy but a comparatively small portion of the meter, and ranging close to the center, leaving a greater amount of space for the fluid. These three advantages—viz., dispensing with the extra gearing and constructing the pistons so that they will occupy but a small portion of the meter and ranging close to the center—have not heretofore been attained in the same meter. My invention accomplishes this object.

A great objection to meters as heretofore constructed is that the contact surfaces of the pistons roll upon each other without any sliding motion, and the sediment in the fluid is continually caught between the pistons, becoming packed there, and the pistons must often be removed and cleaned to prevent clogging.

My invention overcomes this objection, as the contact surfaces all have a sliding motion upon each other as the pistons revolve, and thus the pistons clean each other. This is a very important element in meters, as by constructing them as described they may be used a long time without cleaning.

By attaching a pulley or band-wheel to one of the shafts in place of the indicator my invention may be used as an engine, and the power obtained will vary with the size of the machine and the pressure of the fluid passing through it.

By attaching a crank to one of the pistons a very efficient and useful force-pump is obtained, as by turning the crank the fluid is forced through with great power; or it may be advantageously used as a blower.

When it is desirable to afford more space for the fluid entering the meter, heads a a' a^2 and b b' b^2 and the recesses d d' d^2 and e, e', and e^2 may be diminished in size. When, on the other hand, my invention is to be employed as

a motor, and it is desirable to save water, the heads a a' a^2 and b b' b^2 and the recesses d d' d^2 and e e' e^2 may be enlarged.

The case between the points g and g' and g^2 and g^3 may be lined with a separate piece of metal, in which event the depression at g, g', g^2, and g^3 need not be cast with the case, the edges of these linings forming said offsets.

What I claim as new, and of my invention, is as follows, viz:

In a meter, the combination of the two pistons A and B, each being provided with three or more radial arms or buckets, the latter having circular heads a a' a^2 and b b' b^2, and corresponding depressions e e' e^2 and d d' d^2, to receive the heads, said depressions having grooves or channels z and projections f f' f^2 f^3 f^4 f^5 and c c' c^2 c^3 c^4 c^5, with corresponding depressions in the neck of the heads m m' m^2 m^3 m^4 m^5 and n n' n^2 n^3 n^4 n^5, to receive the projections, all constructed and operated as and for the purpose specified.

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Attest:

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