2 Sheets—Sheet 1.

A. W. POCOCK.

WATER-METER.

No. 182,471. Patented Sept. 19, 1876.

Fig. 1.

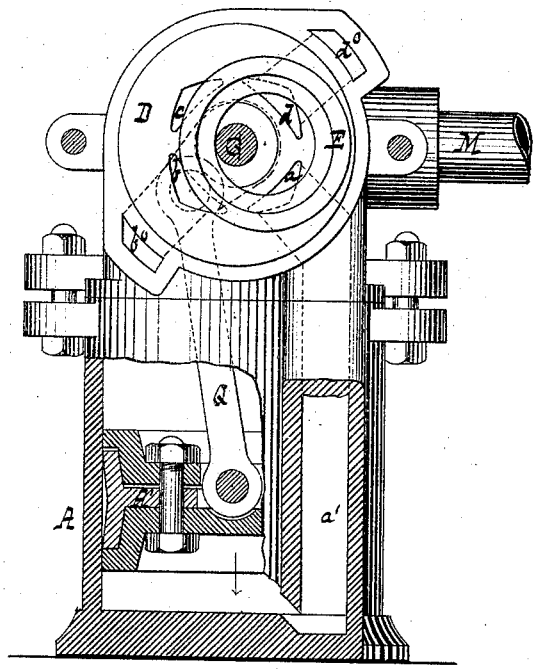
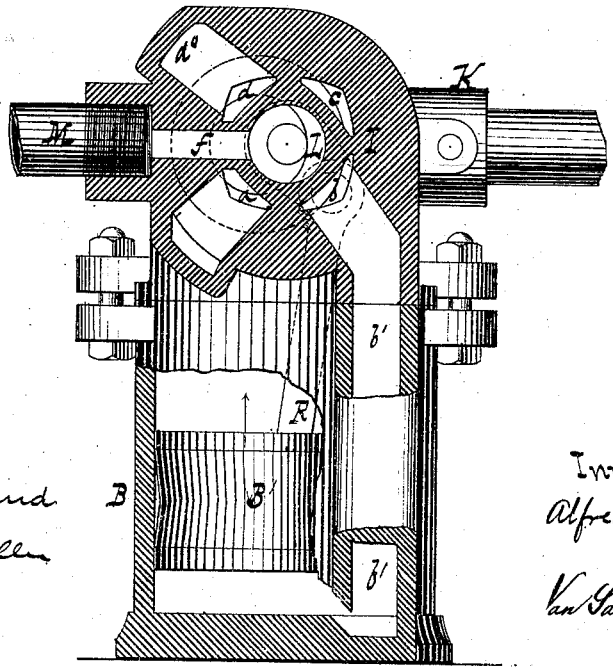


Fig. 2.



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2 Sheets—Sheet 2.

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Fig. 3.

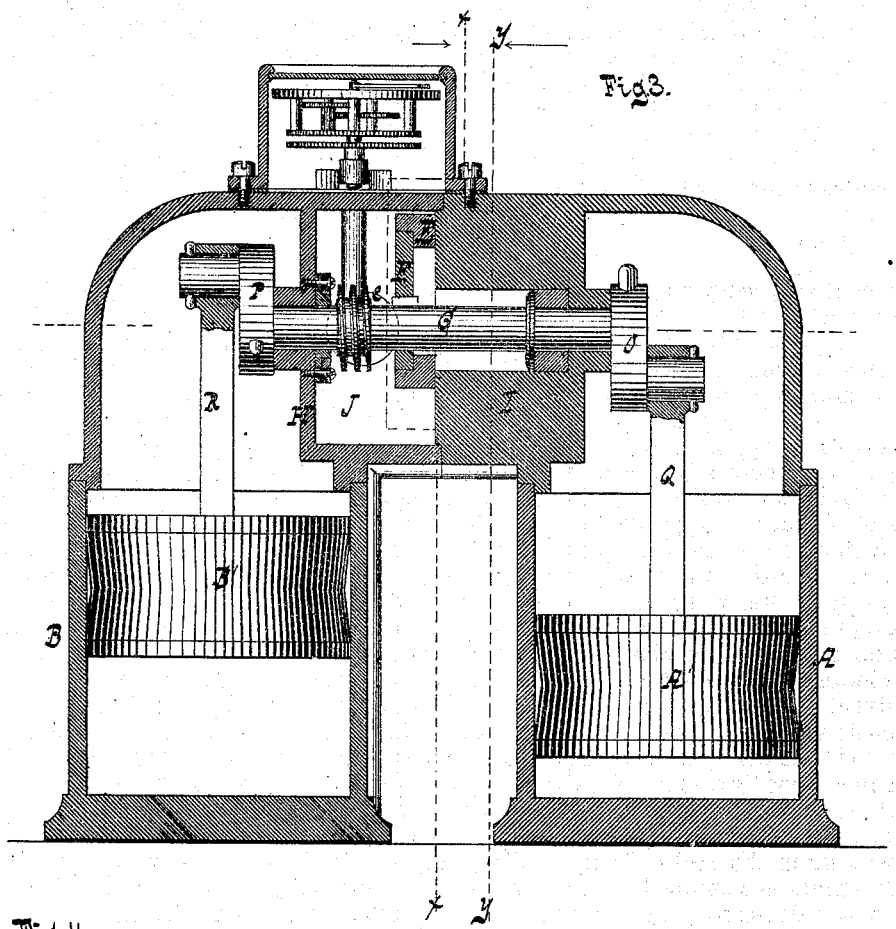
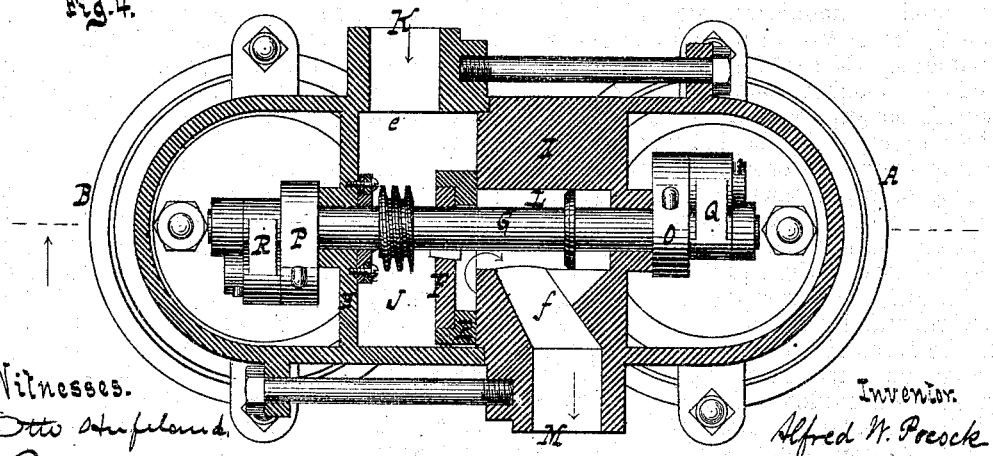


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALFRED W. POCOCK, OF LONDON, ENGLAND.

IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. **182,471**, dated September 19, 1876; application filed June 22, 1876.

To all whom it may concern:

Be it known that I, ALFRED W. POCOCK, of London, England, have invented a new and useful Improvement in Water-Meters, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a transverse vertical section in the plane *x x*, Fig. 3, looking in the direction of the arrow opposite to that line. Fig. 2 is a similar view in the plane *y y*, Fig. 3, looking in the direction of the arrow opposite to that line. Fig. 3 is a longitudinal vertical section in the plane *z z*, Fig. 2. Fig. 4 is a horizontal section in the plane *x' x'*, Fig. 3.

Similar letters indicate corresponding parts.

This invention relates to a liquid-meter, which consists of two cylinders which are closed at their bottom ends and connected together at their tops by a common valve-chamber, which forms the bearings for a double crank-shaft, the cranks of which connect with pistons working in the two cylinders. With this crank-shaft is combined a valve, which travels on a valve-seat provided with four ports, which communicate, two with the lower, and the other two with the upper, parts of the cylinders, while in the valve-chamber are formed two chambers, one of which communicates with the supply-pipe and the other with the delivery-pipe. By the motion of the valve the various ports are brought to communicate with each other, so that while the cylinders receive liquid in one part, the liquid contained in the other part is free to discharge, and that by the pressure of the liquid the pistons are caused to reciprocate, the crank-shaft is caused to revolve, and, by a suitable connection between the crank-shaft and a registering mechanism, the quantity of liquid passing through the meter is recorded. The valve is placed loosely on an eccentric disk, which is firmly secured to the crank-shaft, so that the pressure of the liquid keeps the valve down on its seat.

In the drawing, the letters A B designate two cylinders, each of which contains a piston, A' and B', and which are closed at their bottom ends, and connected at their tops by a common valve-chamber, C. This valve-chamber is provided with a valve-seat, D, on which works an annular valve, E, which is fitted loosely on an eccentric disk, F, that is secured firmly on a shaft, G, which has its bearings in partitions H I, extending transversely through the valve-chamber. Between the partitions is situated a chamber, J, which communicates, by means of a channel, *e*, Fig. 3, with the supply-pipe K, and in the partition I is formed a chamber, L, which communicates, through a channel, *f*, Figs. 2 and 3, with the delivery-pipe M.

In the valve-seat D are four ports, *a b c d*, which communicate with the two cylinders A B, as follows: The port *a*, through a channel, *a'*, with the lower part of the cylinder A; the port *b*, through channels b^0 and *b'*, with the lower part of the cylinder B; the port *d*, through a channel, d^0, with the upper part of cylinder B. If the valve occupies the position shown in Fig. 1, the lower part of the cylinder A communicates, through a channel, *a'*, and port *a*, and through the hollow part of the valve E, with the chamber L, which communicates with the delivery-pipe M. The upper part of the cylinder A communicates, through port *c*, with the chamber J and supply-pipe K, and the lower part of the cylinder B communicates, through channels *b' b*^{0} and port *b*, also with the chamber J and supply-pipe K; and if the liquid (which must have a certain pressure or head) is admitted to the meter, the piston in the cylinder A is forced down and that in the cylinder B is forced up, and the liquid contained in the lower part of the cylinder A and in the upper part of cylinder B is forced out through the delivery-pipe.

On the shaft G are firmly secured two cranks, O P, at right angles to each other. The cranks connect, by pitmen-rods Q R, with the two pistons, and as these pistons move by the pressure of the liquid, the shaft G is caused to revolve. By the time the crank O, Fig. 3, passes its lower center, the crank P is at its half center and the valve has assumed such a position that the port *c* is covered, and the liquid from the supply-pipe flows only to the lower part of the cylinder B. When the crank O has passed its lower center, the port *a* becomes uncovered, and the liquid flows to the lower parts of both cylinders until the crank P reaches its upper center; then the port *b* is closed; and when the crank P has passed its

upper center, the port *d* becomes uncovered and the liquid flows to the upper part of cylinder B as well as to the lower part of cylinder A.

From this description it will be seen that in my meter no dead-point is possible; for when either of the cranks passes one of its dead-centers the other crank is in its most favorable position to turn the crank-shaft, and it requires but little pressure to keep my meter in motion. It will also be readily seen that when the meter is at rest no liquid can pass through it, and, consequently, all the liquid which passes through the meter must be correctly measured.

The registering device S receives its motion by a worm, *m*, on the shaft G, which gears in a worm-wheel mounted on a spindle, *a*, that extends out through the top of the valve-chamber, and is geared together with the registering-wheels. For the purpose of registering, any mechanism suitable for this purpose may be employed.

What I claim as new, and desire to secure by Letters Patent, is—

The combination, in a liquid-meter, of two pistons working in suitable cylinders, a double crank-shaft, a valve, a valve-chamber provided with two partitions forming one chamber, which communicates with the supply-pipe, and another chamber, which communicates with the delivery-pipe, and a valve-seat, provided with four ports, two of which communicate with the lower, and the other two with the upper, parts of the two cylinders, all constructed and operating substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand.

ALFD. WILLIAM POCOCK.

Witnesses:
CHARLES CROFT,
JNO. EDD. SMITH.