

F. A. FOWLER.

LIQUID-METER.

No. 178,623.

Patented June 13, 1876.

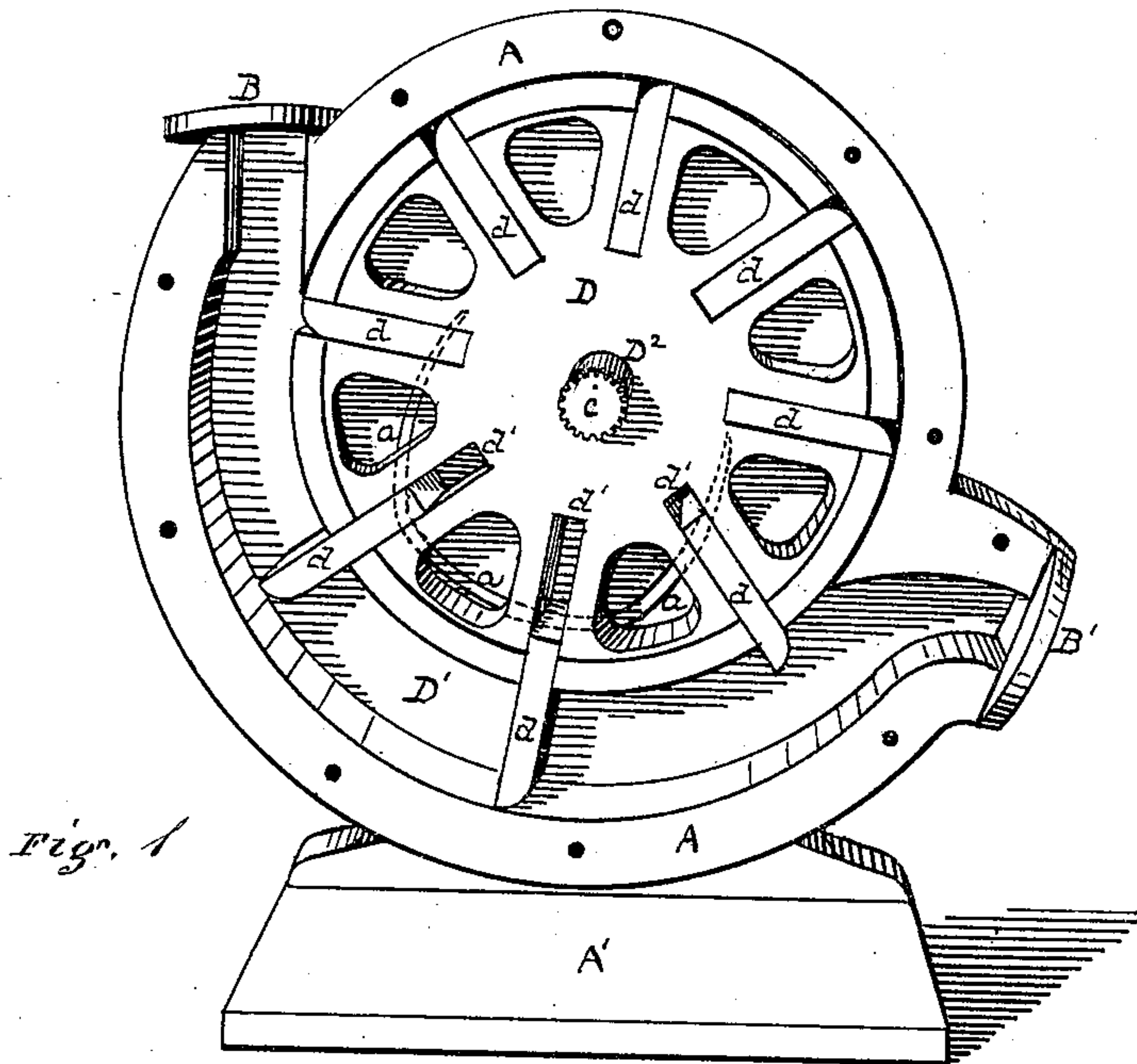


Fig. 1

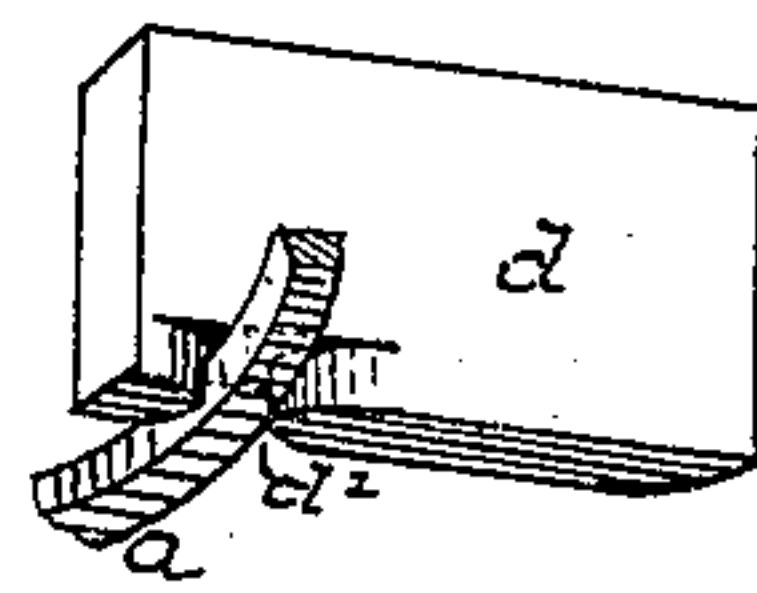


Fig. 4.

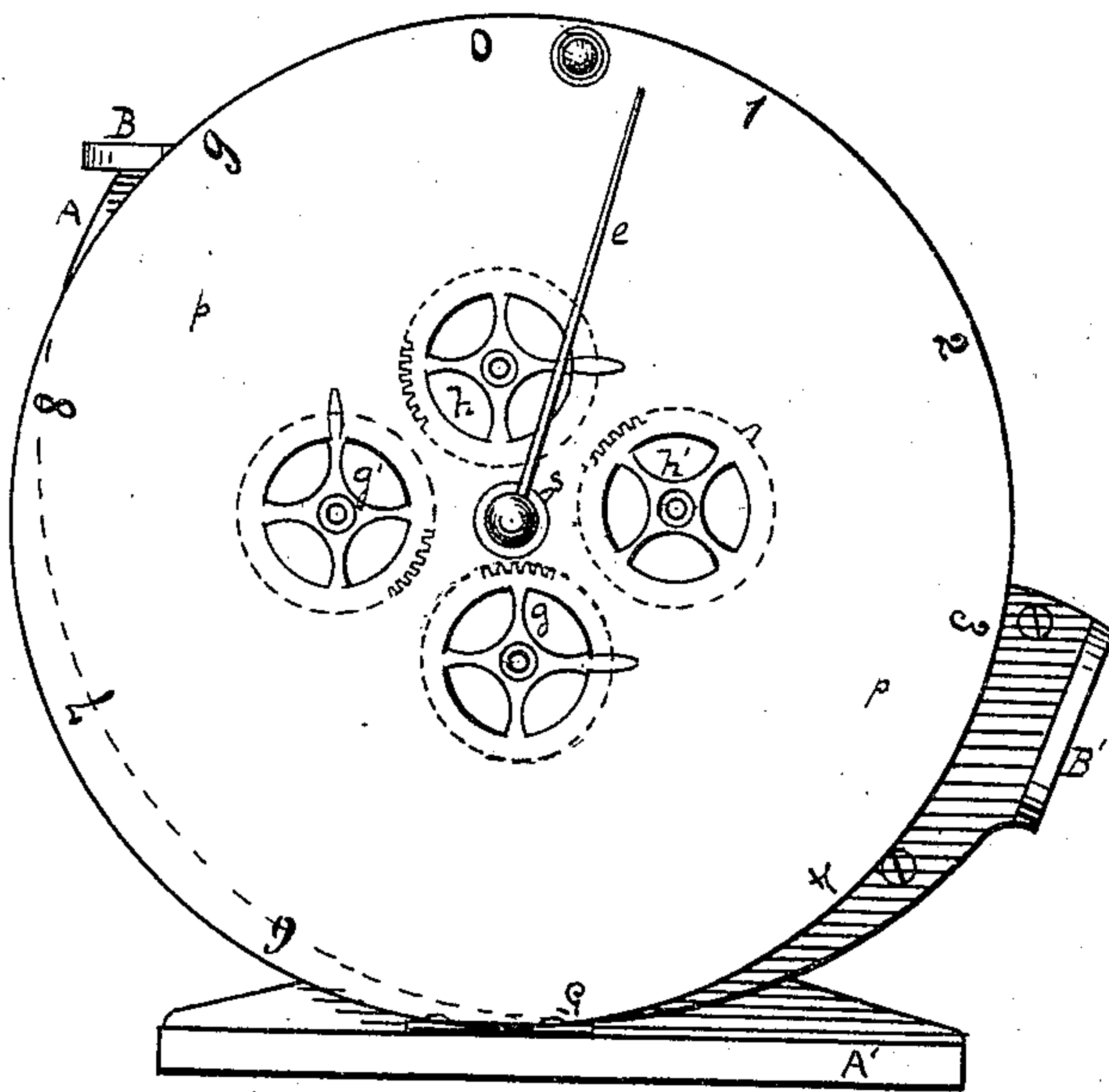


Fig. 2.

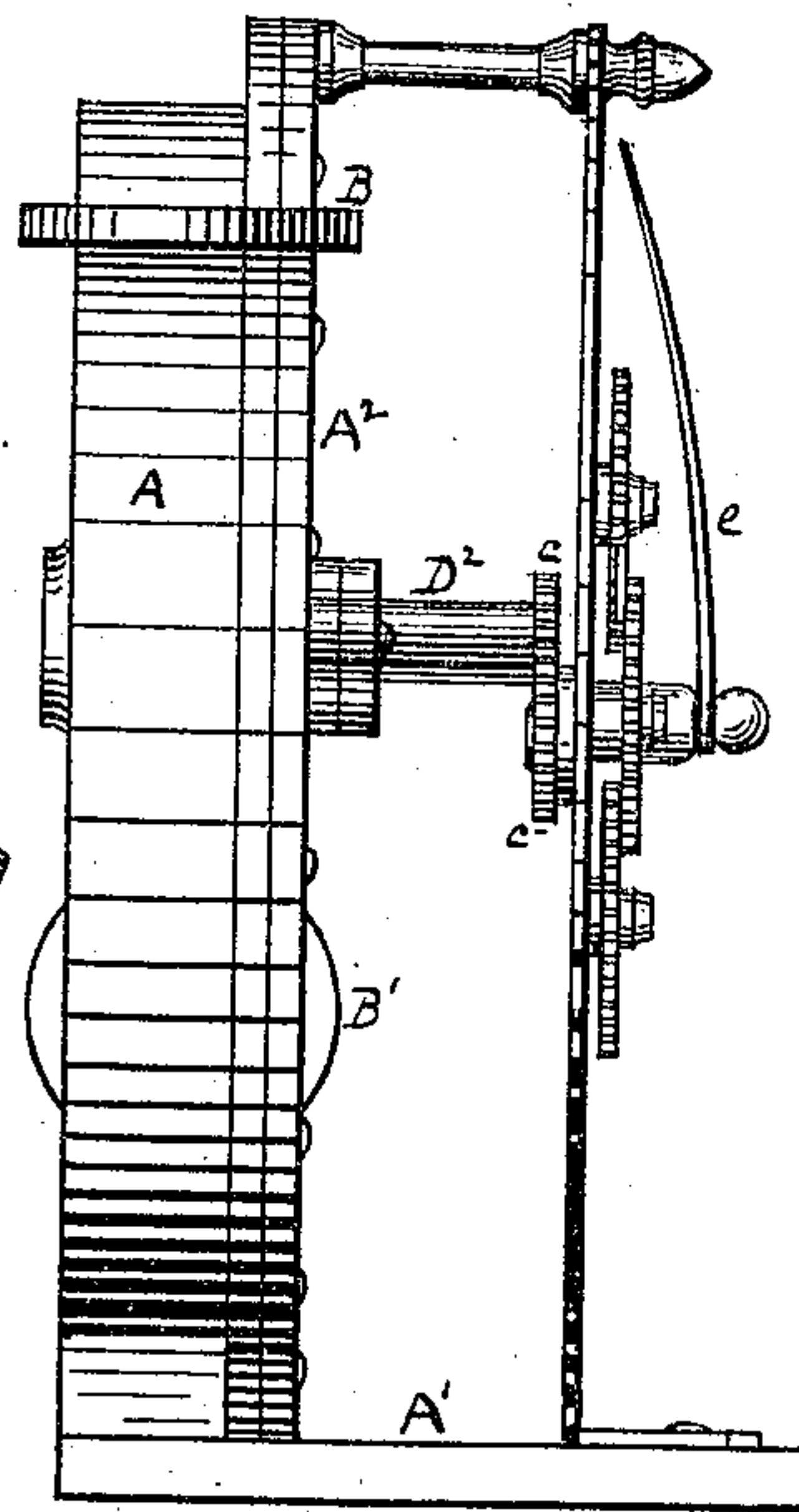


Fig. 3.

Witnesses

J. E. Boggs

Claudio S. Parker

Inventor: Franklin A. Fowler,

By George W. Christy,  
his Atty.



# UNITED STATES PATENT OFFICE.

FRANKLIN A. FOWLER, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR TO  
HIMSELF AND ALGERNON S. BELL, OF SAME PLACE.

## IMPROVEMENT IN LIQUID-METERS.

Specification forming part of Letters Patent No. **178,623**, dated June 13, 1876; application filed  
December 18, 1875.

*To all whom it may concern:*

Be it known that I, FRANKLIN A. FOWLER, of Allegheny, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Liquid-Meters; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a side view, in perspective, of my improved meter with the cap or face-plate and registering apparatus removed. Fig. 2 is a like view of the whole complete. Fig. 3 is an end elevation of the same; and Fig. 4 is a detached perspective view of one of the pistons and the fixed eccentric guide-rail.

The case A is supported by any suitable base, A<sup>1</sup>, and is closed by a cap or cover, A<sup>2</sup>. It is furnished with a supply-port, B, and a discharge-port, B<sup>1</sup>, with which ports the usual pipes are to be connected. Within the case is a wheel, D, outside the periphery of which, and inside the case, is a chamber, D', which extends, in the direction of the revolution of the wheel, from the supply to the discharge port, opening at its ends into both. Through the remainder of the revolution of the wheel it works closely in its case, so as to prevent serious loss by leakage, but with sufficient freedom so as not to be seriously impeded by friction. This part of the case, in fact, forms a continuous abutment from the discharge-port to the inlet-port, and by this feature of construction the additional advantage is secured of leaving little or no room for dead water, or for the accumulation of the sediment or solid impurities which always are present in greater or less quantities in water, oil, &c. Meters having dead-water space are often obstructed in this manner. The wheel D turns on and with a shaft or axle, D<sup>2</sup>, which extends into, and on one side through, the face-plates of the case, and rests in suitable packing or bearings. At intervals less than the distance between the points of supply and discharge it has recesses d<sup>1</sup>, of suitable size and shape for receiving, carrying, and guiding the sliding pistons d. These pistons, when projected into the chamber D<sup>1</sup>,

each constitutes a diaphragm, to cut off communication forward and back, and two of them form a chamber to measure the fluid inclosed between them, and the last one projected receives the fluid-pressure, which causes the wheel to revolve and register. To give these pistons the motions indicated, and cause them to perform their office-work, I arrange on the inner face of one of the face or cap plates an eccentric or cam-shaped guide-rail, a, and make in the corresponding edge of each piston d a notch or recess, d<sup>2</sup>, Fig. 4.

As each piston passes from the point of discharge to that of supply it occupies its recess. As it comes to the point of supply its notch d<sup>2</sup> begins to engage the adjacent end of the guide a, (which is preferably made with a slight taper,) and is thereby forced out, or projected gradually across the chamber D<sup>1</sup>. This motion results from the eccentricity of that part of the guide. Such piston is then in position across the chamber D<sup>1</sup>, and is kept in that position by a concentric part of the guide, until the piston next following shall have been in like manner projected across the chamber D<sup>1</sup>, so that between the two one measure of the fluid will be contained. Then, or as soon after as may be desired, the forward piston is caused to commence its inward or return stroke by a like eccentric or cam-shaped part of the guide a, as shown in the drawing, so that as soon as the discharge-port is passed it will be wholly in its recess. The sides of the groove d<sup>2</sup> are rounded, as shown in Fig. 4, the better to secure the motions described.

For the purpose of registering the amount of water passing through, any suitable apparatus may be employed. As shown, a gear-wheel, c, on the end of the axle D<sup>2</sup> meshes into a wheel, c', on the axle of which is an index-finger, e, which indicates on the dial-plate p each additional unit of measure. At each revolution a tooth, s, moves a wheel, g, a distance which indicates the total registry of one revolution of the finger e, and so on, through any desired number of wheels g' h h', &c., at pleasure.

The apparatus described may, with equal advantage, be applied to the measurement of other fluids, and, particularly, petroleum and

its distillates; and, with such changes as will come within the knowledge of the skilled mechanic, it may be used as a pump or water-wheel.

The pistons described are preferably made of hard material, such as case-hardened steel, and then they can be made quite thin and light. The selection of the proper materials for the other parts will come within the knowledge of the skilled workman.

I claim herein as my invention—

A meter-case having an abutment extending

from the discharge-port to the inlet-port, and a wheel working closely against such abutment, in combination with recessed pistons *d* and eccentric guide-rail *a*, arranged and combined substantially as set forth.

In testimony whereof I have hereunto set my hand.

FRANKLIN A. FOWLER.

Witnesses:

ALGERNON S. BELL,  
JAMES M. CHRISTY.