F. PHILIPPI.

WATER-METER.

No. 170,895. Patented Dec. 7, 1875.

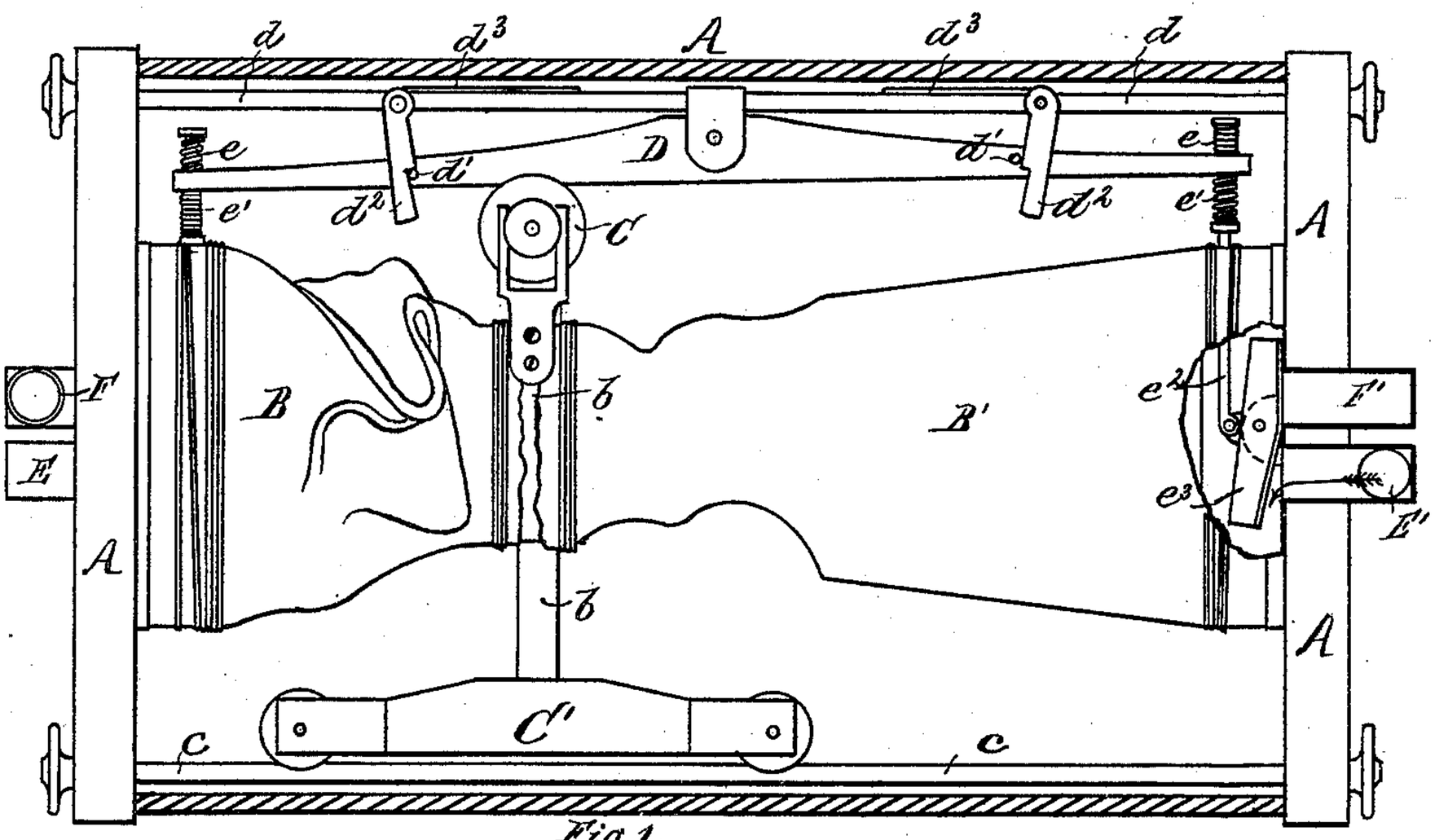


Fig. 1.

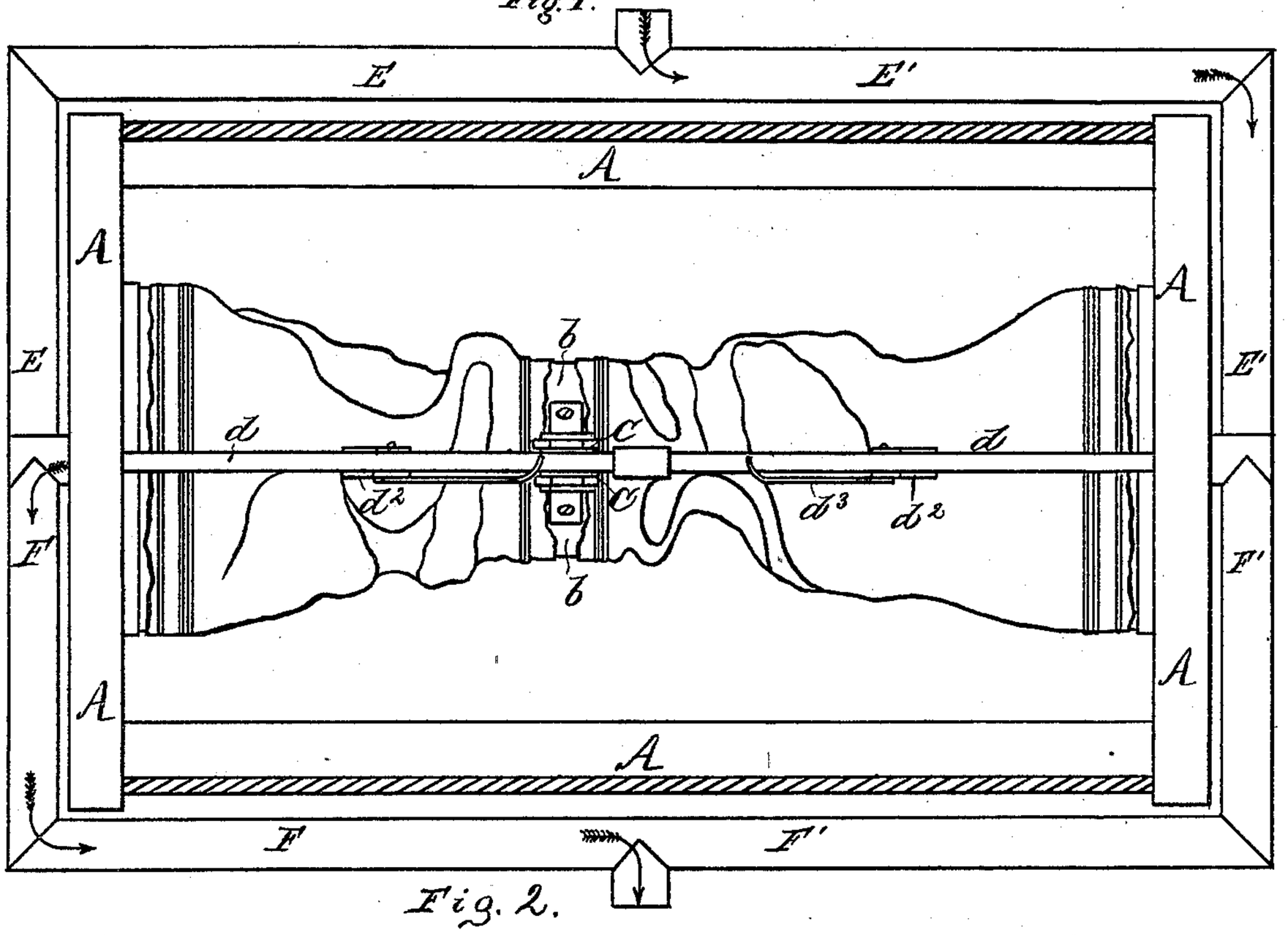


Fig. 2.

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# UNITED STATES PATENT OFFICE.

FREDERICK PHILIPPI, OF ST. LOUIS, MISSOURI.

## IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. **170,895**, dated December 7, 1875; application filed May 1, 1875.

*To all whom it may concern:*

Be it known that I, FREDERICK PHILIPPI, of St. Louis, in the county of St. Louis and State of Missouri, have invented a new and useful Improved Water-Meter, of which the following is a specification:

This invention relates to that class of liquid-meters which work or measure the fluid by means of bags. The water, in filling one bag, expands it, and in doing so contracts by emptying the other, and vice versa, and it is this emptying of each bag measured by a registering device that determines the quantity of the liquid passed through the apparatus. The features or means accomplishing this operation are the inlet-pipes with the bags, and their further connection to a tilting lever that controls the valves in each bag, all arranged to operate in the manner now to appear.

Of the drawing, Figure 1 is a longitudinal section through the apparatus, with valve parts also shown, Fig. 2 being a top plan of Fig. 1, showing, besides, the pipe arrangement.

My meter is surrounded by a suitable casing filled with water, so as to equalize the pressure on the apparatus.

A is the inside framing, upon which the operative parts are mounted. To the sides of the frame A the bags B B′ are secured in a water-tight manner. These bags can be of cloth, leather, rubber, or similar material. I divide the bags by a water-tight partition, *b*, which forms the two compartment-bags B B′, the object being to allow the liquid to fill one of said bags while the other empties. The partition *b* at top carries a roller, C, which runs along the lower edge of a tilting lever. Forming part of the bottom of the partition *b* is a truck, C′, having rollers, which run along on top of a brace-rod, *c*, (see Fig. 1,) the object of the rollers above and below being not only to guide and ease the motion of the bags to and fro, but specially to utilize the movement of the bags to control the valve attachment, which further controls the inlet and outlet of the liquid in its passage to and out from the meter. Hence this valve attachment consists as follows: D is a tilting lever, pivoted centrally to a brace-rod, *d*. Said lever has stops at $d^1$, which engage the notched arms $d^2$, which are pivoted to the brace-rod *d*. (See Fig. 1.) $d^3$ are springs which hold the arms $d^2$ against the stops. The arms $d^2$ project below the lever, as shown in Fig. 1, so as to be operated by the contact of the upper roller C. The outer lever ends have springs *e* above and springs $e^1$ below, and connect by valve-rod $e^2$ to a pivoted valve, $e^3$, as clearly shown in Fig. 1. E E′ are the supply-pipes. F F′ are the discharge-pipes. All said pipes enter the apparatus where t e valve $e^3$ controls their openings.

The position of the meter being as shown in the drawing, the operation of the apparatus is as follows: The valve to the right opening the supply-pipe E′, the fluid enters, filling the bag B′, and by force causing the movable partition *b* to move to the left, while at same time the water is being forced out of the bag B through the discharge-pipe F. The bag B keeps on discharging until, by the contact of the roller C with the left-hand arm $d^2$, this is thrown out of engagement, causing the opposite lever end to become engaged with the arm $d^2$, which reverses the valve $e^3$, and the water then enters through the opposite supply-pipe E into the empty bag B, filling the same, and at the same time emptying the bag B′ through the discharge-pipe F′, the roller C still moving to the right, until, by contact with the arm $d^2$, the operation of the valve attachment is reversed, and thus one bag is filling while the other discharges.

Any suitable registering device is attached to the apparatus, by means whereof the number of discharges of the fluid from each bag is kept known.

What I claim is—

The combination of the bags B B′, movable partition *b*, carrying-roller C, truck C′, the tilting lever D, having stops $d^1$, arms $d^2$, and valve attachments $e^3$, with inlet and discharge pipes E E′ F F′, all arranged to operate in the manner and for the purpose set forth.

In testimony of said invention I have hereunto set my hand.

FRED. PHILIPPI.

Witnesses:

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