

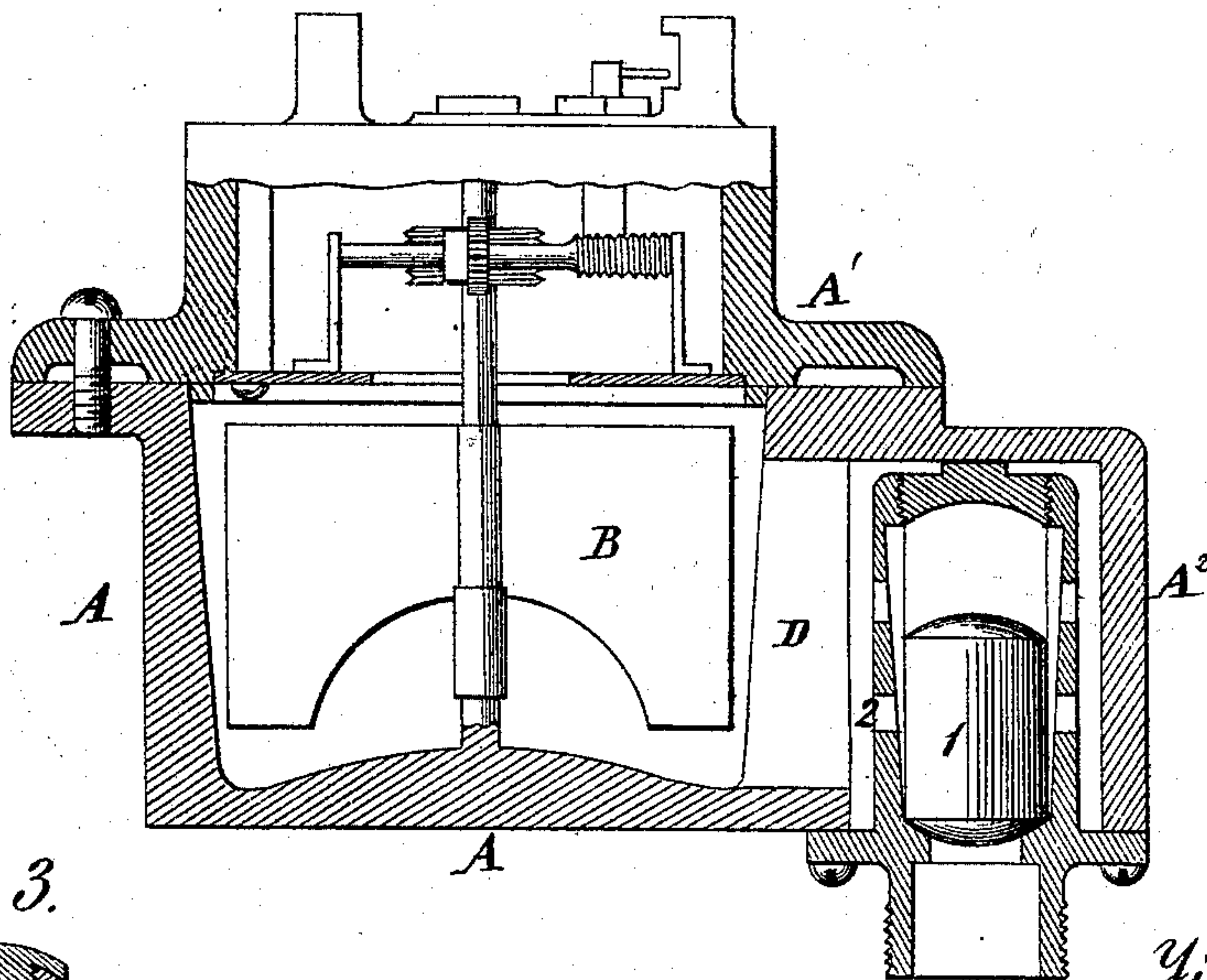
J. M. BLANCHARD.

Liquid-Meters.

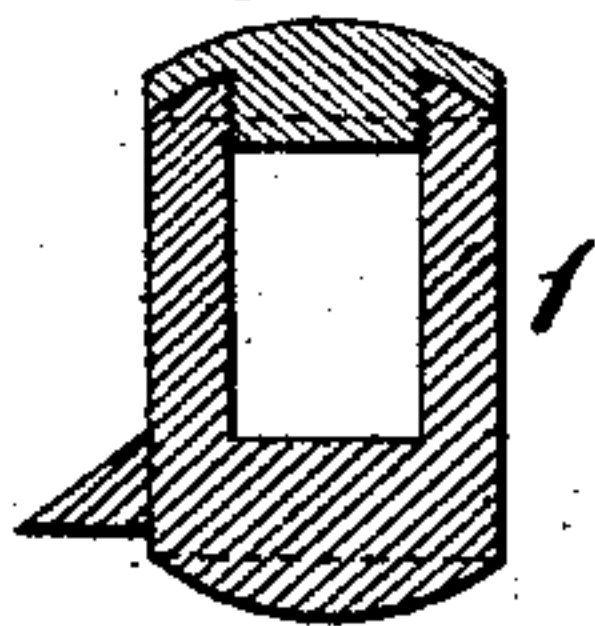
No. 151,196.

Patented May 26, 1874.

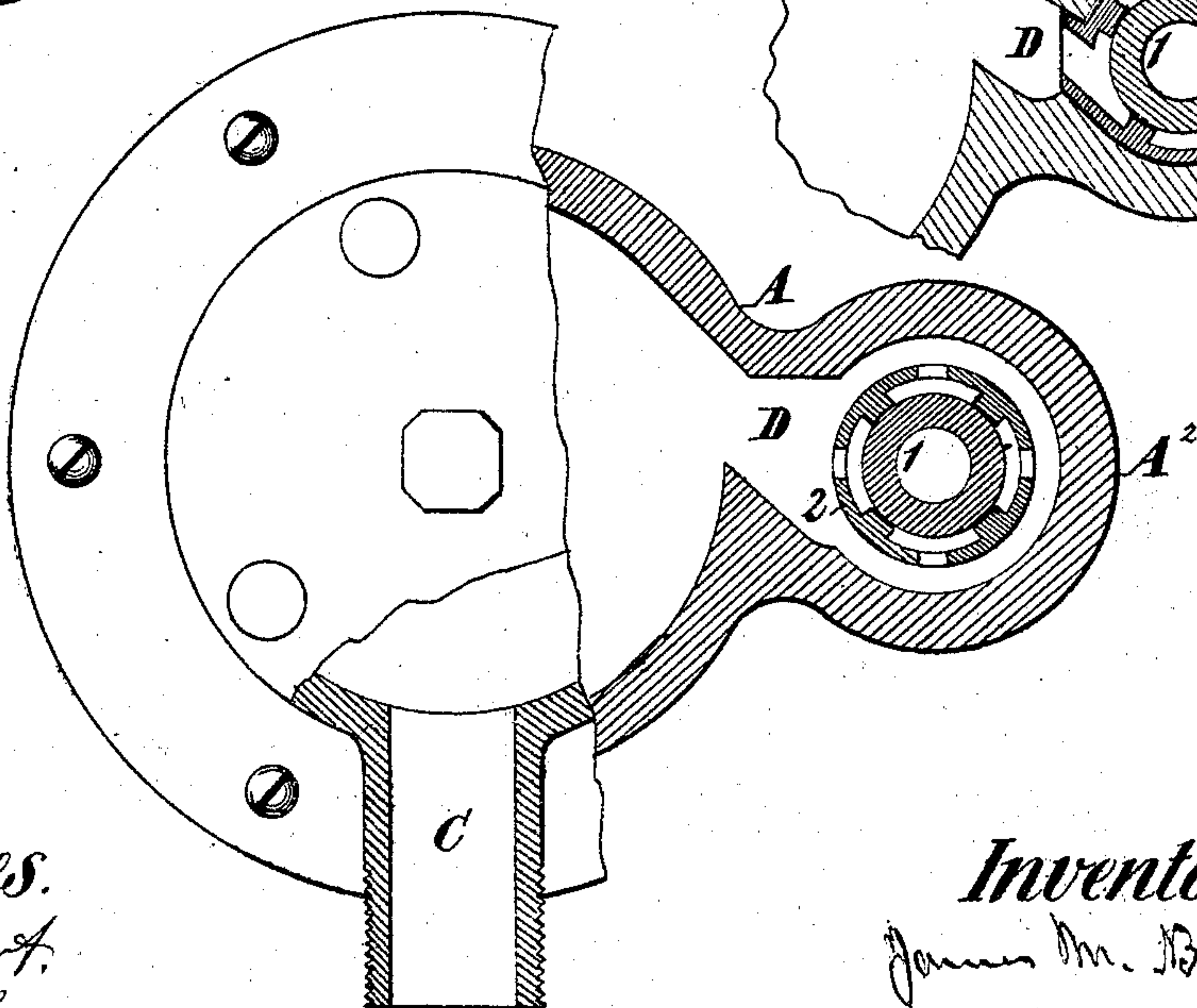
*Fig. 1.*



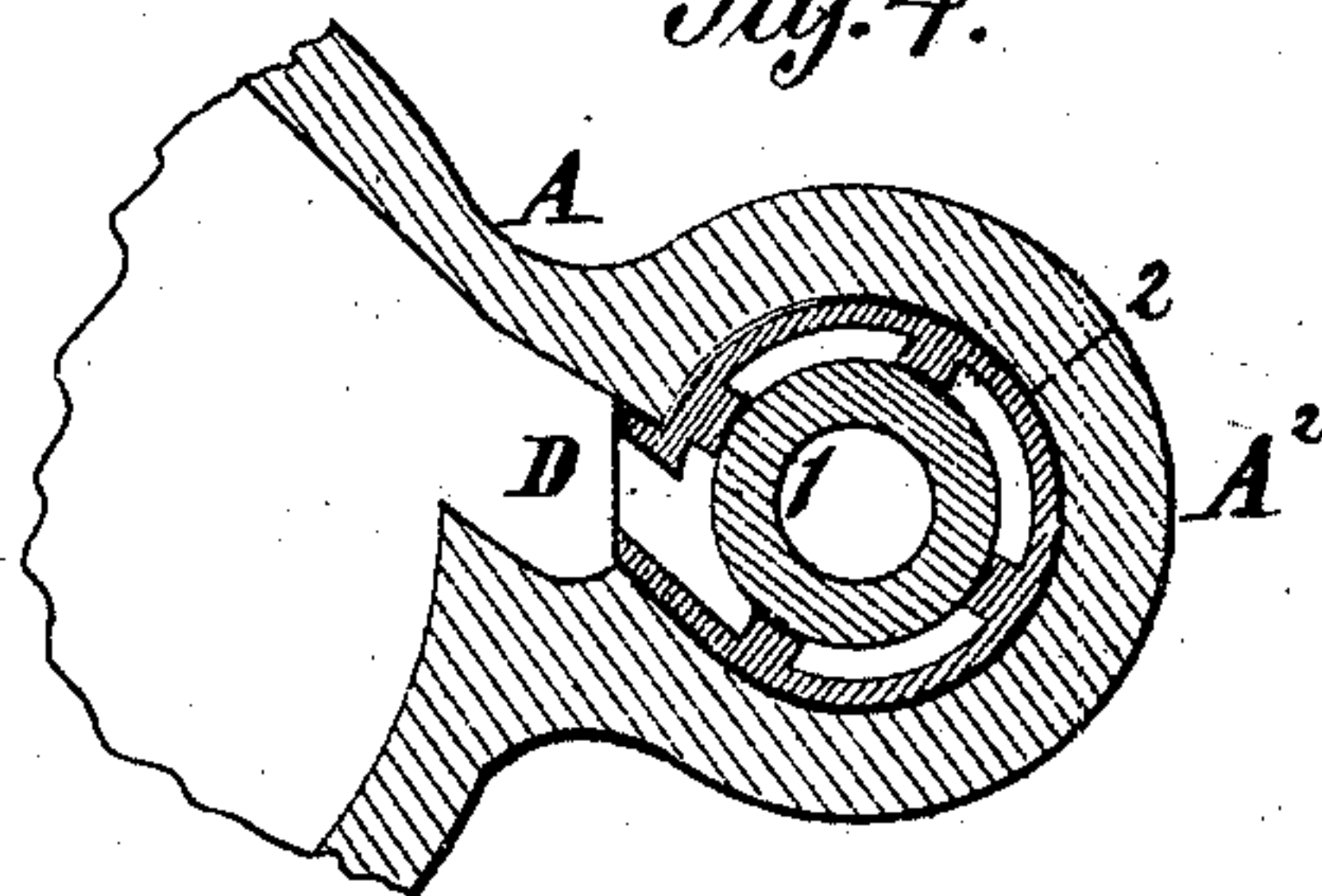
*Fig. 3.*



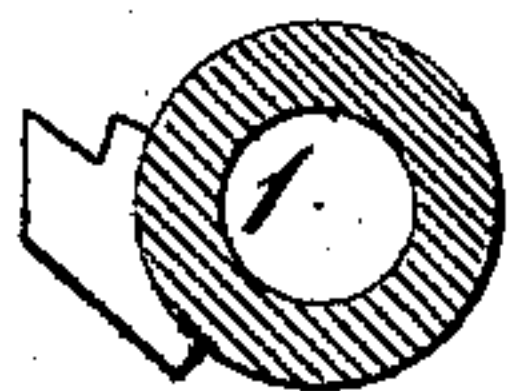
*Fig. 2.*



*Fig. 4.*



*Fig. 5.*



*Witnesses.*  
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# UNITED STATES PATENT OFFICE.

JAMES M. BLANCHARD, OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN LIQUID-METERS.

Specification forming part of Letters Patent No. 151,196, dated May 26, 1874; application filed April 25, 1874.

*To all whom it may concern:*

Be it known that I, JAMES M. BLANCHARD, of Washington, in the county of Washington and District of Columbia, have invented certain new and useful Improvements in Liquid-Meters; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification:

Figure 1 is a sectional elevation of my improved meter, showing the case, the measuring-wheel, the registering mechanism, the valve for regulating the induction of the liquid to be measured, and the cage in which it is placed. Fig. 2 is a plan view with a portion of the cover removed, for the purpose of showing the position of the regulating-valve, the induction-ports through the case, and the eduction-passage. Fig. 3 is a sectional elevation of the regulating-valve, showing its construction. Fig. 4 is a plan view of a modified form of the regulating-valve and its cage, showing also a portion of its case; and Fig. 5 is a plan view of the valve, showing the projection on its side for giving direction to the ingoing liquid.

Corresponding letters denote like parts in all of the figures.

This invention relates to that class of meters which are used for measuring liquids; and it consists in combining with such machines a single floating valve, for the purpose of regulating the induction to or eduction from the case or cylinder thereof of the liquid to be measured; and it further consists in the construction of the valve-cage, as will be more fully explained hereinafter.

Nearly all meters now in use enable consumers to obtain a considerable amount of water which has not been registered, and consequently for which they are not charged. This fact has been found to be a serious objection to meters now in use, and especially so in places where a large number of these machines are used, the aggregate of the water thus obtained without payment amounting to many thousands of gallons daily. In constructing meters of this general character it

is therefore important that the arrangement, as well as the construction of their parts, should be such that no considerable amount of water or other liquid can be drawn from the eduction pipe or passage without causing the registering mechanism to be moved to such an extent as to cause a correct registration thereof to be made.

The object had in view, therefore, in the construction of this meter is to so construct and arrange its parts that no considerable amount of liquid can be drawn from the eduction side of the measuring mechanism thereof which has not caused the registering mechanism to take account of it, and to leave a record thereof upon its face.

In selecting a meter, in connection with which to show my improvements, I have chosen the simple form in which a measuring-wheel is employed; but I desire it to be understood that it is equally applicable to meters in which a piston or any other form of device is used for measuring the liquid which passes through it.

In the example shown, A is a case of metal, upon the upper surface of which a cap, A<sup>1</sup>, is placed in such a manner that the two shall form a water-tight chamber for the wheel B to rotate in, the cap being furnished with an outlet-passage, C, for the liquid after it has been measured, said outlet being so arranged with reference to the induction-port as to cause the liquid to pass nearly around the chamber after it enters the same before being allowed to escape, in order that the movements of the wheel and of the liquid shall be coincident, so that a correct measurement of such liquid may be had. The shaft of the wheel B extends up into a recess formed in the cap A<sup>1</sup>, and carries upon its upper end a worm-wheel or other suitable device for operating the registering mechanism, which may be of any approved form, but which, as it forms no part of my present invention, need not be particularly described here, as the construction and operation of such devices are well known. In order that adequate provision may be made for the induction of the liquid to the measuring mechanism, there is attached to the side of the case A a projection, A<sup>2</sup>, which has an aperture in its lower surface for the reception of a valve



and its cage, which will soon be described. This projection has an aperture in it, which, as shown in Fig. 1, is larger than the valve-cage which passes into it, said aperture communicating with the wheel-chamber by means of an opening, D, which is of such form that it directs the ingoing liquid away from the eduction-passage, and directly against the buckets of the measuring-wheel. As none of the parts above described, when separately considered, constitute any part of my present invention, they need not be further described, what has been said of them being for the purpose of enabling the constructor of this class of meters to make them and to show them in connection with those parts which constitute my present invention. As above stated, it is necessary, in order that a correct registration of the water or other liquid passing through the meter may be had, that no amount, however small, shall be able to pass without moving the registering mechanism. In order that this may be accomplished, I place in the induction-passage a single floating valve, the weight of which is to be regulated according to its area and to the pressure which is required to move the measuring and the registering mechanism. This valve, which is designated by the numeral 1, is made to rest upon a seat in its cage 2, or in the induction-pipe, when no water is being drawn from the eduction-pipe, it being held there by its own gravity, which is sufficient, until an opening is made in said eduction-pipe by the turning of a cock or faucet, or in some other manner, which is sufficiently large to relieve the pressure to such an extent as to cause the amount of liquid which will pass to insure the movement of the measuring and the registering mechanism, when the valve will rise and allow the required amount to pass, and its rise will be regulated by the size of the stream that is drawn from the eduction-pipe; or, in other words, by the extent to which the pressure is relieved on the eduction side of the valve. It will be apparent that this result will be produced when it is remembered that the pressure upon the induction side of the valve is nearly constant, it only varying there as the head of the water in the source of supply varies.

The form of valve which I prefer to use for the production of the result named is shown in Figs. 3 and 5, where it is shown as consisting of a tube of metal having its lower end fixed and its upper end removable, in order that its weight may be changed by inserting into the cavity, in its center, shot or other substances, to cause it to rise with a greater or

less difference of pressure upon the eduction and induction sides thereof, according to the amount of force required to move the mechanism of the meter, it requiring more in those which employ cylinders and pistons than in those in which measuring devices are used, which move with less friction. In general, this valve will be placed in a cage, 2, in order that it may be readily removed for changing its weight. This cage has upon its interior surface ribs, as shown in Figs. 1, 2, and 4, the spaces between being quite narrow at the bottom, but increasing toward the top of the cage, in order that when it is required that a large amount of water shall pass, it shall have room to do so, the valve at such times being near the upper portion of the cage. In order that, when only a small quantity of water is passing, it may be directed with increased force against the buckets of the wheel, the form of cage shown in Fig. 4 is preferred, its outer surface being made to fit the aperture in the projection upon the case and having a single opening for the water, which is so arranged as to conduct it directly into the wheel-chamber. When a cage of the form last described is used I place upon the side of the valve a projection, as shown in Figs. 3 and 5, for the purpose of more directly conducting the water to the buckets of the wheel when only a small stream is being drawn.

I have described the valve as placed in the induction-passage, but it may be placed in the eduction pipe or passage, and the same result be accomplished.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In combination with a liquid-meter, a single floating valve, constructed and arranged substantially as herein described, whereby it is rendered capable of having its weight graduated for regulating the flow of water or other liquids to or from such meters, substantially in the manner and for the purpose set forth.

2. The cage 2, when constructed with passages for the liquid which increase in size from its bottom to its top, and with a side aperture for the discharge of the liquid in the direction of the measuring mechanism, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own invention, I affix my signature in presence of two witnesses.

JAMES M. BLANCHARD.

Witnesses:

C. M. CONNELL,

G. R. BLANCHARD.