

I. P. TICE.
Liquid Meters.

No. 125,152.

Patented April 2, 1872.

Fig. 1.

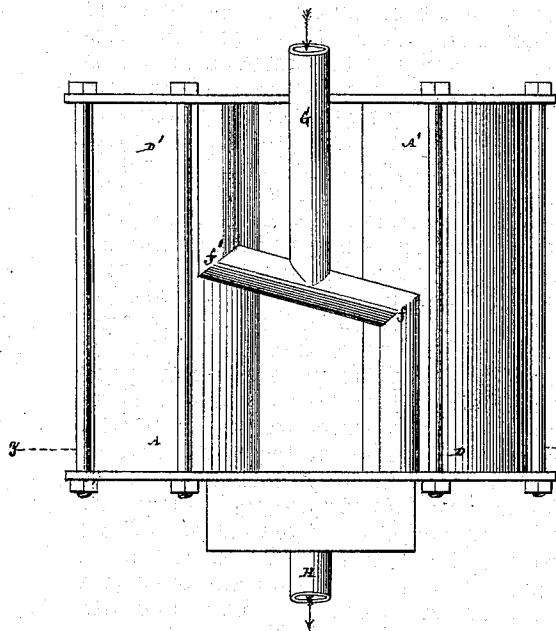


Fig. 2.

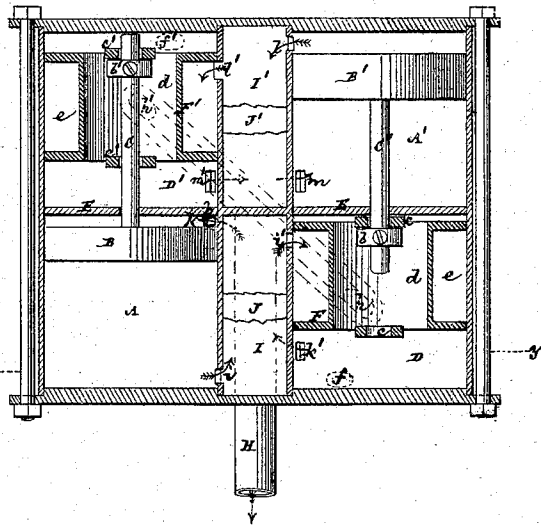
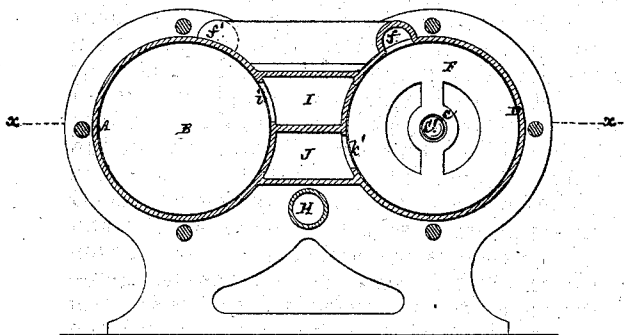


Fig. 3.



Witnesses:
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IMPROVEMENT IN LIQUID-METERS.

Specification forming part of Letters Patent No. 125,152, dated April 2, 1872.

To all whom it may concern:

Be it known that I, ISAAC P. TICE, of the city, county, and State of New York, have invented a new and useful Improvement in Liquid-Meters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a plan of a liquid-meter constructed in accordance with my invention; Fig. 2, a horizontal section of the same taken mainly at the line *xx* in Fig. 3, which latter is a vertical section at or near the line *yy* in Figs 1 and 2.

Similar letters of reference indicate corresponding parts throughout the several figures of the drawing.

This invention relates to that description of liquid-meters in which cylinders, with pistons working therein, are employed as the measures of capacity, and is virtually an improvement upon the meter described in Letters Patent No. 113,366, issued to me April 4, 1871, in which two cylinders, having two independent valve-chambers, which may be connected with an inlet-pipe and outlet-pipe common to both chambers, are used, and in which meter the piston-rod of either one cylinder is made to pass or work directly into the valve-chamber of the other cylinder. The invention consists in a novel construction and arrangement of the cylinder, their passages and ports, whereby increased simplicity is attained in the production of the same as a whole, together with greater economy and less liability of making waste or imperfect castings. The invention also includes a continuous construction of the valve-chambers with the cylinders of the meter, and of like diameter therewith, in combination with partitions dividing them from the cylinders, whereby the valve-chambers may be bored out at one and the same time, and in a continuous manner with the cylinders, and whereby the construction of the meter, as a whole, is further simplified and cheapened.

In the accompanying drawing, A A' represent the two cylinders, and B B' the pistons working therein, C C' being the piston-rods. D D' are the two valve-chambers formed at the ends of the cylinders, and in a continuous manner with said cylinders, also of the same

diameter thereat, so that they may be bored out in common with the cylinders without removing or changing the cutter, said valve-chambers being afterward separated from the cylinders by the insertion of diaphragms or partitions E E. These valve-chambers adjoin the cylinders at opposite ends, and the valves in them control the pistons of adjacent cylinders, the piston-rod of either one cylinder passing directly through either partition E into the chamber of the valve that controls the piston of the other cylinder. F F' are the valves, of cylindrical construction, and arranged to freely slide within the valve-chambers D D', to reverse the travel of the pistons they respectively control; said valves being operated alternately in opposite directions at or toward the ends of the stroke of the pistons, which move them by means of projections *bb'* on the piston-rods striking alternately opposite guides or ends *cc* and *c'c'* of the valves. These valves F F' are each formed with a tubular passage, *d*, through them from end to end, for flow of the inlet-water therethrough, and with an exhaust-cavity, *e*, outside of them. G is the induction-pipe, and H the outlet or eduction pipe. The induction-pipe G is represented as connected, by branches *ff'*, with the outer ends of the valve-chambers D D' beyond the throw of the valves, which arrangement allows of both cylinders being supplied from one and the same inlet-pipe. The eduction or exhaust pipe H is also divaricated or branched to connect, as at *hh'*, with the valve-chambers D D', within the range of the travel of the valves or their exhaust-cavities *ee*. Between the cylinders A A' and the valve-chambers D D' are upper passages or chambers I I' and lower passages or chambers J J'. The one upper chamber, I, connects, in a cross-manner—that is, at its opposite ends, by ports *ii'*, with the outer end of the cylinder A and with the inner portion of the valve-chamber D, and the chamber J beneath it connects, also in a cross-manner, by ports *kk'*, with the inner end of the cylinder A and with the outer end or portion of said valve-chamber D, the ports *ii'k'* both being within range of the valve F. The other upper chamber, I', connects, in a direct manner, by ports *ll'*, with the outer end of the cylinder A', and with the outer end of the valve-chamber D'; and the chamber J' beneath

it connects, also in a direct manner, by ports $m\ m'$, with the inner end of the cylinder A' and the inner end of the valve-chamber D' , the ports $l' m'$ both being within range of the valve F' .

This construction of the passages and ports, in connection with the cylinders and valve-chambers, is simple, reduces the amount of metal, dispenses with separate passage attachments, and allows of the whole being cast in one piece without much or any risk of making an imperfect casting.

In the operation of the meter the travel of the pistons is reversed accordingly as the valves $F\ F'$ establish communication, by the ports $i' l'$ and $l' m'$, with the supply and exhaust connections.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination of the chambers or passages $I\ J\ I'\ J'$ and the ports $i\ i'$, $k\ k'$, $l\ l'$, and $m\ m'$ with the cylinders $A\ A'$ and valve-chambers $D\ D'$, when arranged in relation with each other, substantially as specified.

2. The valve-chambers $D\ D'$ of a continuous cylindrical construction, with the cylinders $A\ A'$, and of like interior diameters, in combination with the diaphragms or partitions $E\ E'$, essentially as shown and described.

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Witnesses:

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