J. Taggart,

Water Meter.

No. 74254 Patented Feb. 11. 1868

Fig. 1.

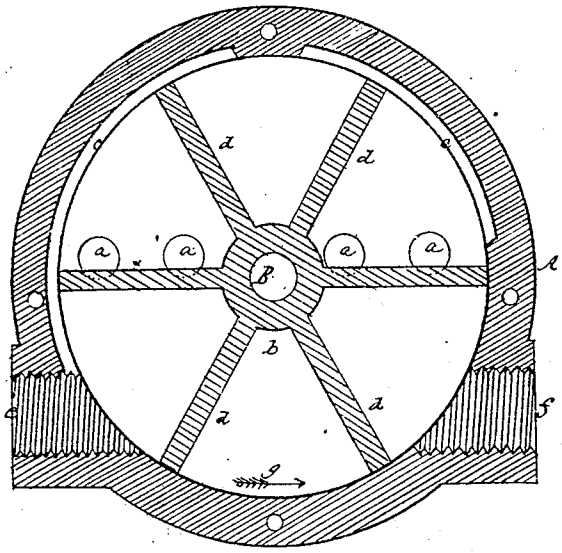


Fig. 2.

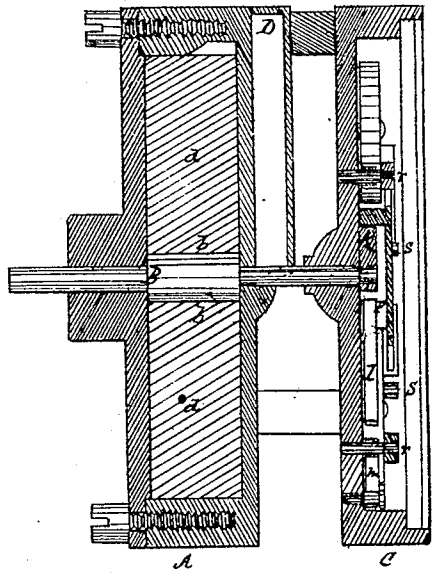
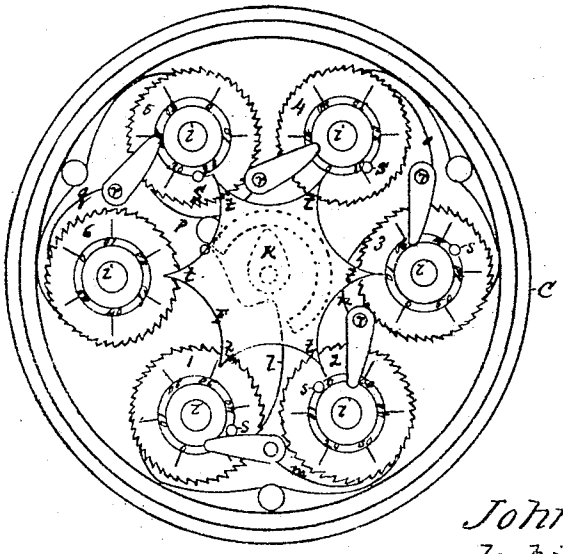


Fig. 3.



Witnesses.

Samuel N. Piper.
J. R. Snow.

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by his attorney.
R. H. Eddy

United States Patent Office.

JOHN TAGGART, OF ROXBURY, ASSIGNOR TO HIMSELF AND DANIEL C. HOLDER, OF DORCHESTER, MASSACHUSETTS.

Letters Patent No. 74,254, *dated February* 11, 1868.

IMPROVEMENT IN WATER-METERS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL PERSONS TO WHOM THESE PRESENTS SHALL COME:

Be it known that I, JOHN TAGGART, of Roxbury, in the county of Norfolk, and State of Massachusetts, have invented an "Improved Water-Meter;" and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 denotes a vertical section, and

Figure 2 a transverse section of it.

Figure 3 is a front view of its registering-mechanism.

In such drawings, A denotes a cylindrical case, having a shaft, B, arranged axially in it, and extending through it, and another and separate cylindrical case, C, in which is placed the registering-apparatus, to be hereinafter described. Besides the two cases A C, is a narrow air-vessel or chamber, D, semicircular in form, it being arranged against one side of the case A, and provided with one or more openings, *a a a a*, which lead from such air-vessel into the case A, and at or just above the horizontal diameter thereof, the same being as shown in fig. 1. Within the case A is a series of floats, *d d*, &c., which radiate at equal distances apart from a hub, *b*, fixed on and concentrically with the shaft B. The hub and its floats constitute a flutter or undershot water-wheel, which extends from one end or head to the other of the case C. Each float projects from the axis of the shaft a like distance, that is to say, the extension should be such as to cause the floats, while revolving against the lower half of the inner periphery of the case A, to touch or approach the same as nearly as possible. The upper half of the rim of the case, or that part which is above the openings *a a*, is recessed, as shown at *c c*, in order that the wheel, while revolving by such part, may not touch it. Below the horizontal diameter of the case A such case is furnished with an induction-passage, *e*, and an eduction-passage, *f*, they being arranged in such case, and with respect to the wheel, in manner as represented in fig. 1. The direction of revolution of the wheel is indicated by the arrow *g*.

The case A, provided with the wheel and air-chamber, as described, is to be applied to a water-conduit, so that water carried thereby may flow under a head or pressure into the case and through the induction-opening *e*, and out of the case by the opening *f*. The consequence of this flowage of the water through the case, will be that the wheel will be put in revolution, and the water will stand within the case and its air-chamber at a level, a little above the openings *a a*, the air within the chamber being compressed more or less in accordance with the degree of pressure or head of water. The arrangement of the induction and discharge-openings of the case A, with respect to the floats of the wheel, is such that, while the said wheel may be in revolution, there will be at least one of the floats between such openings.

The air-chamber is found to render the meter much more certain, as a measurer of the amount of water which may flow through it in any given period, and to operate to much better advantage than it will without such chamber.

The registering-apparatus is to determine the number of revolutions made by the wheel, each revolution of it being supposed to indicate the discharge from the case of a determinate quantity of fluid or fractional portion of a gallon, cubic foot, or other amount taken as a unit of measure.

A series of ratchets, 1, 2, 3, 4, 5, 6, is arranged within the case A, and on separate and stationary axes, *i i i*, &c., each ratchet being free to revolve on its axis. Each ratchet I usually make with fifty teeth, but do not confine my invention to such number, there being divisions and numbers marked on the face of the ratchet.

On that part of the shaft B which extends into the case C, is a cam or wiper, *k*, which, during each revolution of the shaft, will be forced against and made to pass by a spring-lever pawl or click, *l*, whose longer arm is a curved spring, whose free end bears against the periphery of the ratchet 1. This pressure against the pawl tends to straighten the pawl, and thereby cause it to turn the ratchet through an arc measured by one of its teeth. The inherent elastic force of the flexile arm of the pawl causes such arm to slip back on the ratchet, after each movement of the ratchet and each movement of the cam away from the inflexile arm of the pawl. There is, to the next and each succeeding ratchet, another such spring-lever pawl, these pawls and their arrangements with the ratchets being shown at *m n o p q*. The inflexile arm of each pawl turns freely on a centre-pin

or fulcrum, shown at *r*, as projecting from one side of the case C. Furthermore, there projects from each of the ratchets, except the last one of the series, a small stud, *s*, which, at the proper time, is carried by the ratchet around against the operative pawl of the next ratchet, and actuates it in the same manner as the lever-pawl *l* operates the ratchet 1. A stellated index-plate, F, having an index-point, *t*, for each of the ratchets, and being fastened to the case C, and arranged within it and with respect to the ratchets, in manner as represented in the drawings, serves to indicate each entire or a partial revolution of each of the ratchets.

Now, if the first ratchet have fifty teeth, and it is revolved once during the passage of fifty cubic feet of water through the meter, it will measure from one to fifty cubic feet. As each entire revolution of each ratchet will move through the next one in advance one tooth, supposing each to have fifty teeth, the entire revolution of the second ratchet will show that twenty-five hundred cubic feet of water will have passed through the meter. Each entire revolution of each ratchet will exhibit fifty times the measure represented by one revolution of the next preceding ratchet.

I am aware that this registering-apparatus is somewhat analogous to what is employed in gas-meters, but in the use of spring-levers, and the cams or studs applied to the wheel-shaft and the ratchets, and made to operate and be operated in manner as described, as my registering-apparatus, differs from others.

This meter has been found in practice to be very efficient in its operations and correct in measurement. Its simplicity of construction enables it to be made at a very small price, and renders it not liable to easily get out of order or be deranged while in action.

The arrangement of the air-chamber between the cases A C causes one side or one head of one case common to it and the air-chamber, and disposes of the air-chamber to good advantage.

What I claim as my invention is as follows:

I claim the improved meter, consisting of the case, with its induction and eduction-passages, and the wheel, arranged as specified, and the air-chamber or vessel to open into the case, as set forth.

I also claim the arrangement of the air-chamber or vessel between the wheel-case and the case of the registering-mechanism.

I also claim the combination for actuating each of the ratchets, the same consisting not only of a cam or stud applied to a rotary shaft or to a ratchet, but of a lever formed with an inflexile arm, and the other a flexile or bowed spring, to operate as set forth.

I also claim the combination and arrangement of the stellated indicator F with the case C, and the series of ratchets or rotary measuring-wheels, arranged within the case, and provided with mechanism for operating them, substantially as described.

JOHN TAGGART.

Witnesses:

R. H. EDDY,

F. P. HALE, Jr.