W. P. RHODES, Sr. & J. H. SWARTZ.

Water-Meter.

No. 168,528. Patented Oct. 5, 1875.

Fig: 1

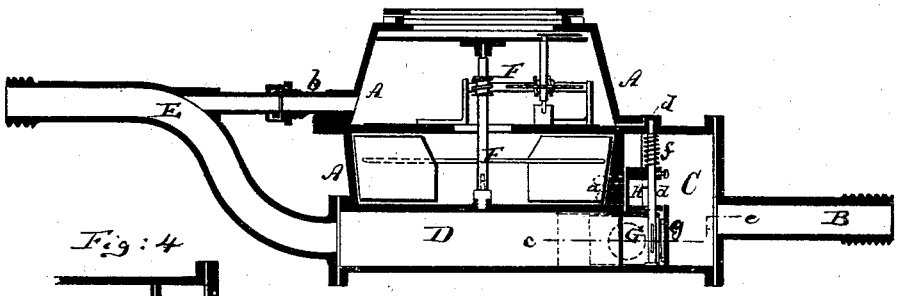


Fig: 4

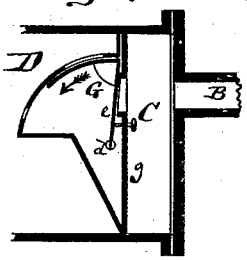


Fig: 2

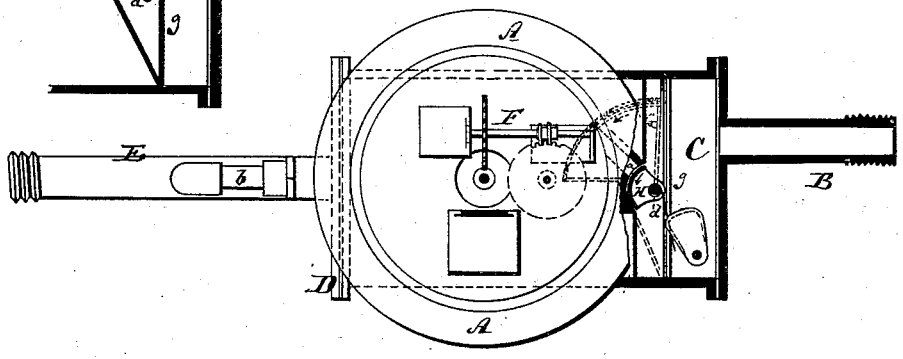
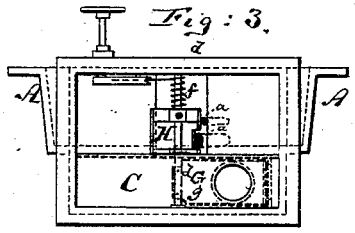


Fig: 3.



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UNITED STATES PATENT OFFICE

WILLIAM P. RHODES AND JOHN H. SWARTZ, OF BROOKLYN, NEW YORK, ASSIGNORS TO SAID RHODES AND DE WITT C. TAYLOR, OF SAME PLACE.

IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. **168,528**, dated October 5, 1875; application filed June 12, 1875.

To all whom it may concern:

Be it known that we, WILLIAM P. RHODES and JOHN H. SWARTZ, both of Brooklyn, in the county of Kings and State of New York, have invented a certain new and Improved Water-Meter, of which the following is a specification:

Figure 1 is a vertical central section of our improved water-meter; Fig. 2, a plan view, partly in section, of the same; Fig. 3, an end view, showing the inlet-openings, and Fig. 4 a detail horizontal section on the line *c c*, Fig. 1.

Similar letters of reference indicate corresponding parts in all the figures.

The object of this invention is to produce a water-meter which, by receiving part of a current of water, will measure the whole current, thereby providing much cheaper and more convenient means of measuring a stream of any size than is obtained when the whole stream passes through the working part of the meter.

The invention consists in the application of two valves to said meter, one valve being in the way of the main current that does not enter the working and registering part of the meter, while the other valve is in the way of the entrance-opening to such working and registering part of the meter. These two valves are mounted on the same shaft, or otherwise so intimately connected with each other that the larger valve, which, as already described, is controlled by the main current, will regulate the position of the upper or smaller valve, that controls the entrance of the water into the working and registering part of the meter.

Thus it is that when a full current approaches the meter it will open the main or larger valve entirely, thereby also entirely opening the valve that leads to the working and registering part of the meter, and allowing as full a current as possible to enter such meter; whereas, if a smaller current passes through the pipe, the main valve will not be fully opened, and therefore a less part of the current will be admitted into the working and registering part of the meter. Thus the action of the meter will be influenced by the size of the current passing by the meter. A spring or counterpoise of suitable kind is applied to the valves for the purpose of counteracting the force of the current, and closing the valves proportionately against weaker currents.

In the accompanying drawing, the letter A represents the body of a water-meter containing within it suitable working, measuring, or registering devices, which it is not here necessary to describe, since the same do not constitute part of the present invention. B is the water-inlet pipe to the meter, being of a size to receive the full current of water to be measured. This pipe B leads into a chamber, C, which is directly opposite the water-entrance *a* to the body of the meter. The water entrance or aperture *a* has a diameter much smaller than the pipe B, so that only a part of the current of water passing through B will enter the body of the meter through the aperture *a*. The main body of the current will pass from the chamber C through a separate conduit, D, into the discharge-pipe E. The water, passing through the body of the meter, and affecting the registering mechanism F therein, escapes finally through a branch pipe, *b*, into the discharge-pipe E.

It will be seen that by this arrangement the body or working portion of the meter receives but a small proportion of the current to be measured; and it is evident that, in order nevertheless to correctly measure the entire current it is necessary that the water in the meter should have a definite and invariable proportion to the quantity of water passing through the conduit D. In order to insure this proportionate division of the water passing, respectively, through the meter and through the conduit D, we apply two valves, G and H, the first between the chamber C and the conduit D, and the second between the chamber C and the opening *a*. These two valves we prefer to arrange on the same spindle *d*, as shown in Figs. 1 and 3, and to make each in form of a segment, as more clearly shown by reference to Figs. 2 and 4, Fig. 2 showing a section of the upper valve H, while Fig. 4 shows a section of the lower valve G. The lower valve G is so disposed, with reference to the opening from the chamber C into the conduit, that its radius or straight side *e* will be exposed to the current of water entering through the pipe B,

and said current will therefore have the tendency to move the valve G in the direction of the arrow shown in Fig. 4, and to more or less open the aperture leading from the chamber C into the conduit D, as indicated in Fig. 4. A spring, *f*, which is connected with the spindle *d* of the valves, tends to counteract the effect of the current on the valve G, and to hold said valve closed, so that if the current of water slackens, the spring will close the valve in proportion to the reduction of current. Being mounted upon the same spindle *d*, or otherwise connected with each other in equivalent manner, it is evident that the upper valve H will be moved whenever, by the force of the current, as hereinabove described, the lower valve is moved to more or less open or close the entrance to the conduit D; and, as said upper valve H is moved by means of the valve G, it opens more or less in proportion to the degree of motion of the valve G the aperture *a* leading into the meter proper. The amount of water admitted to the meter proper will, consequently, always be proportionate to the amount of water passing into the conduit. The two valves G and H may be adjustable, and should, preferably, be adjustable on their spindle, so that the valves may first be regulated as to their proper position before the meter is allowed to operate. To insure the direct action of the water upon the lower valve we insert an adjustable diaphragm, *g*, across the chamber C in front of the valve G, said diaphragm having a suitable-sized aperture immediately in front of said valve. To fix the limit of closing motion of the lower valve an adjustable pin through the said diaphragm may be used.

The entrance to the working part of the meter may be by one or more passages, as may be deemed desirable. Two are shown in the drawing. The seat for the upper valve H may be made movable to change the direction of the stream that enters the meter-body.

We claim as our invention—

1. In a water-meter the working and registering part of which receives a portion of the current to be measured, the combination of the valve G, which is controlled by the main current of water that does not enter the working and registering part of the meter, with the valve H, which controls the portion of water entering the meter proper, substantially as herein shown and described.

2. The combination of the valve G and H, spindle *d*, and counterpoise or spring *f*, with the body A of the meter, and with the water-conduit D, all substantially as herein shown and described.

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