G. Sickels,

Water Meter.

No. 102,976. Patented May 10. 1870.

Fig. 1.

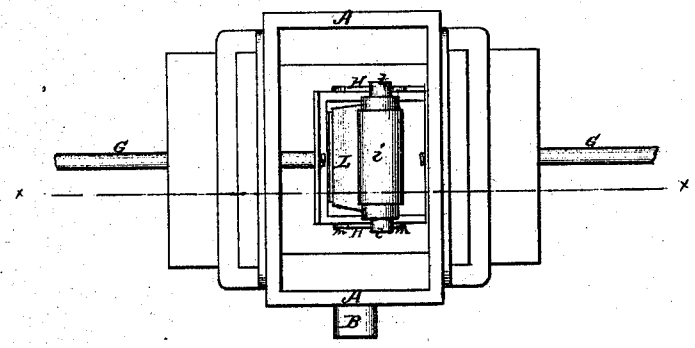


Fig. 2.

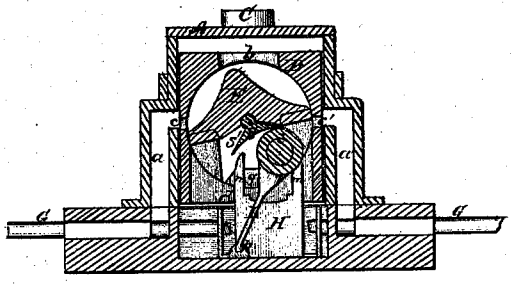


Fig. 5.

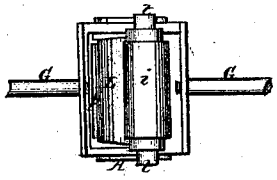


Fig. 3

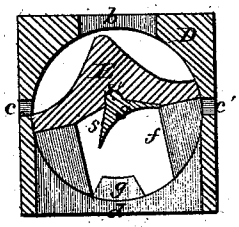
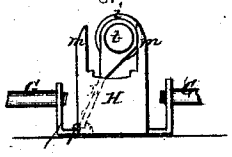


Fig. 4.



Witnesses.
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GERARD SICKELS, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 102,976, *dated May* 10, 1870.

IMPROVEMENT IN WATER-METERS.

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

To all whom it may concern:

Be it known that I, GERARD SICKELS, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Water-Meter Valve; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings and letters of reference marked thereon making a part of this specification, in which—

Figure 1 is a plan view of case showing plan view of my improvements;

Figure 2 is a vertical section on line *x x* of fig. 1; and

Figures 3, 4, and 5 are detail views.

This invention is an improvement upon valve patented by myself September 21, 1869.

I find that, while the valve patented as above works well, and is correct under ordinary circumstances, yet, in certain specific uses to which I put it, in a water-meter, for instance, it is desirable to have more positive as well as greater certainty of action.

My present invention, so far as the movement and construction of the valve, and its relation to ports, and its functions are concerned, is the same as the one represented in my patent above mentioned, but it has for its object the rendering of the action of the valve more certain and positive.

While in theory the construction of the old valve is correct, in practice it is faulty, for the action is too uncertain; for there is danger of the valve resting while the lever is directly under its center. This will more fully appear hereafter.

My invention consists in a swivel surface supplied to the under side of the balance-valve, and a post swiveled at the bottom, but moving at the top, and provided with a rolling or smooth top, and playing between the jaws of posts upon each side, which latter are moved from side to side by the valve-stem, and, moving against the flange of post or lever, carry the latter against the swivel under the valve, raising the valve and its case, opening and closing the ports.

In the drawings—

A is the valve-chest, with exhaust-pipe B and passages *a a'* leading to the ends of a cylinder, and inlet-pipe C at the top.

D is the sliding block, with cylindrical inside, provided with openings *b* and ports *c c'*, and open at lower side, *d*.

The valve E fits snugly inside of sliding block D, and is supported with the circular ends *f* in corresponding openings in block.

g g are projections at the lower portions of circular openings in ends of block D.

The lower side of valve E is provided with swivel S, concave on its under side.

L is a post, oscillating in pivot *p*, situated between the line of the valve-stem G; this lever is provided with a roller or convex surface, *i*.

H is a frame, to the sides of which attach the valve-stem.

The ends of frame H are provided with arms *m m*, which guide and actuate, by movement of valve-stem G, the oscillating post L.

The three last parts, that is, the swivel S, post or lever L, and frame H, constitute the essential features of my improvement.

Operation.

Steam or water being admitted at C will enter, through *b*, the sliding block D, and pass through the port *c* and passage *a* into the cylinder, when it propels the piston, while the exhaust, passing through *a'*, port *c'*, into block D, underneath the valve, will be removed through discharge-pipe B. The valve-stem G, now moving, carries the frame H with it, and the jaws *m*, striking the projections or journals *t*, throw the roller surface *i* toward the center of block D, raising the latter and valve E. The continued motion, carrying the roller *i* beyond the center, will allow the valve E to drop quickly toward port *c'*, until arrested by the sides of the recess in *f*, striking against projections *g* of block D, thus reversing the position of the valve, and permitting the steam or water to enter through port *c'* into passage *a'*. But the roller surface *i* must pass beyond the center of the valve E before the pressure of steam or weight of water upon the upper side of valve, or balance of valve, will cause the depression necessary to close the port.

And it is in this latter connection that I found the old valve (before mentioned) to be uncertain in its action; for, if the pressure from the motor was slight, the valve might rest upon the center, and thus defeat the object sought, in some instances, especially in water-meters, when it is desired to register the quantity of water passing the valve; for there was so little friction to the valve that, while it rested upon the center, it might trip by increased motor. Now, I overcome this defect by the introduction of the swivel S, and the construction of lever L as shown, and the use of frame H. The lever L is pivoted at *p*, allowing its upper end to oscillate, as shown and described.

The action and operation of the roller surface *i* upon the swivel S is peculiar and important. Take the position of valve and lever shown in fig. 2. As soon as the lever starts, its roller surface comes against the edge of the swivel; as the lever advances, it raises the valve and block gradually; when the roller nearly reaches the center, the swivel S changes its relative position to the valve, and its arm S' bears against the under surface of valve, so that, at the time the roller

is directly on the center, it is crowding against the side S′ of swivel, while the swivel assumes with the lever the condition of a link or knuckle-joint, and is crowding with its joint S″ the valve E in the opposite direction from that being traversed by the lever. The valve E does not move till the side S′ of swivel comes in contact with the under surface of the valve E, nor does the lever L travel the space between the jaws *m* till the valve starts. But there is this advantage over a link or knuckle-joint proper: the devices shown do not possess the rigidity of the former, and, of course, are susceptible of more delicate action.

The construction shown insures a continued movement of the valve E, without the least possibility of a halt upon the center; for the jaws *m m*, bearing against the roller journal *t*, as long as there is the slightest movement of the piston by the passage of the least amount of motor, the lever *t* must travel, and the valve E operate accordingly. With this construction water may drop only from the discharge-pipe; still the valve will operate, and the quantity passing be accordingly registered by registering devices, which need not be explained.

The post L need not be provided with roller *i*, as shown, but the top may be a convex surface to a post in one piece.

Having thus fully described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The swivel S, in combination with valve E, substantially as described.

2. The combination of swivel S and valve E with lever or oscillating post L.

3. The combination of post or lever L with frame H, having shoulders or jaws *m m*, substantially as set forth.

4. The combination of post L, frame H, and valve E, provided with swivel S, substantially as set forth.

5. The combination of the last combination with block D and valve-stem G.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GERARD SICKELS.

Witnesses:

CARROLL D. WRIGHT,

CHARLES F. BROWN.