

G. Sickels Piston Meter.

N^o 29316.

Patented July 24, 1860.
Fig. 1

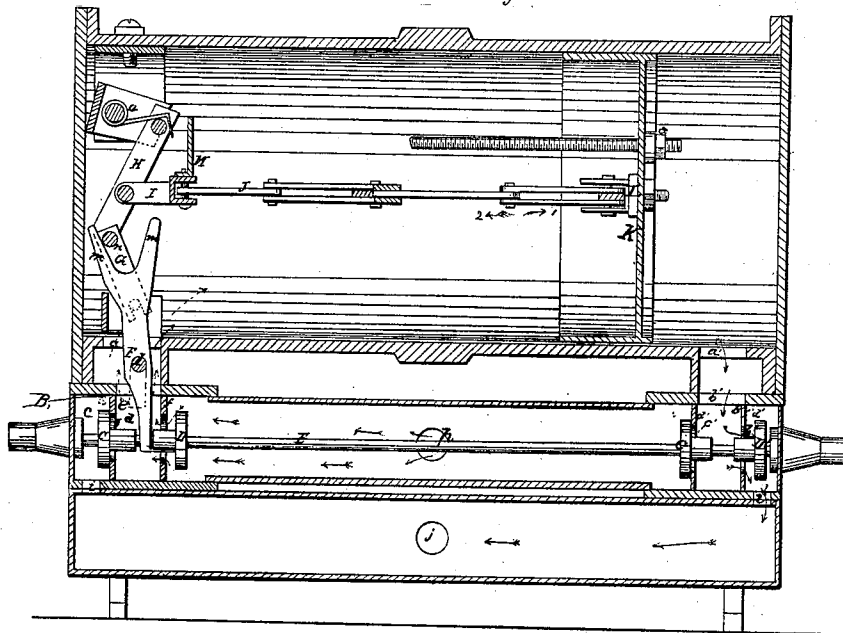
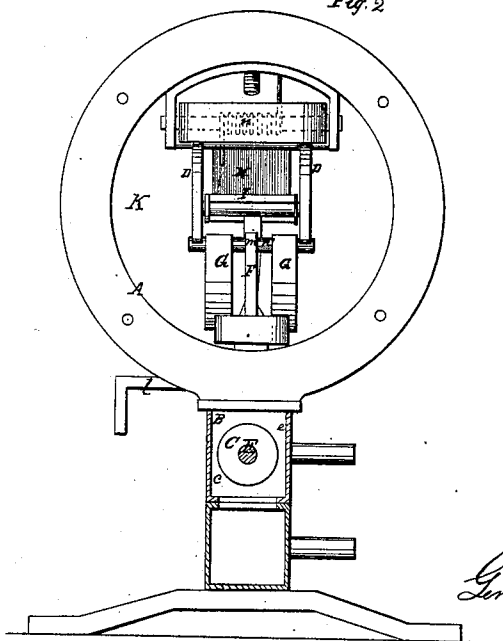


Fig. 2



Witnesses

Bywood
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GERARD SICKELS, OF ROXBURY, MASSACHUSETTS.

WATER-METER.

Specification of Letters Patent No. 29,316, dated July 24, 1860.

To all whom it may concern:

Be it known that I, GERARD SICKELS, of Roxbury, in the county of Norfolk and State of Massachusetts, have invented a new and Improved Water-Meter; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1, represents a longitudinal vertical section of my invention. Fig. 2, is a transverse vertical section of the same.

Similar letters of reference in both views indicate corresponding parts.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation with reference to the drawings.

A represents a cylinder made of cast iron or any other suitable material and strong enough to sustain the requisite pressure. This cylinder is closed at both ends and it connects by means of passages *a, b, a', b'*, with the valve chambers B, B', which in their turn are divided each in two compartments *c, d, and c', d'*, by means of partitions *e, f, e', f'*, and clearly shown in Fig. 1. These partitions are perforated with apertures *g h g' h'* which are alternately opened and closed by the valves C, D, C', D', as will be presently more fully explained.

The compartments *c* and *d'*, of the two valve chambers communicate with the interior of the cylinder through the openings *g* and *h'*, in the partitions *e* and *f'*, if the valves C, and D', are open and they also communicate by passages *i, i'*, with the discharge pipe *j*, thus effecting a communication between the interior of the cylinder and the discharge pipe alternately from one end and from the other as the valves C or D', are opened or closed. The compartments *d*, and *c'*, on the other hand are in direct communication with the interior of the cylinder through the passages *a b a' b'*, and they are brought alternately in communication with the supply pipe *k*, through the openings *h* and *g'*, in the partitions *f*, and *e'*, as the valves D, and C', are opened or closed.

The valves are arranged on a common rod E, and they are changed by a vibrating forked lever F, which is firmly secured to a pivot I, that has its bearings in the sides of the passage *a*. One end of this pivot pro-

jects beyond the side wall of the passage and it serves to operate the registering apparatus, that may be attached to the side of the cylinder A, or to any other convenient place. The lower end of the lever F, embraces the valve rod E, fitting pretty close between the hubs or bosses of the valves C, and D, as clearly shown in Fig. 1.

The upper end of the lever F, is provided with two prongs *m, m'*, which diverge leaving ample play for a rod or pin *n'*, which is firmly secured in two arms G, and which forms the fulcrum for another pair of arms H, that extend to the top of the cylinder A, being subjected to the action of a spring *n*. This spring is connected with the arms H, in such a manner, that its tension is increased as said arms are brought into line with the arms G, and its tension decreases the smaller the angle between the arms G and H. The arms G, turn easily on pivots in the bottom of the cylinder and whenever the arms H, are turned up so as to be in line with the arms G, the spring *n*, has a tendency to throw them on one side or on the other. By this motion the rod *n'*, is brought suddenly in contact with one of the prongs *m*, or *m'*, of the lever F, and the position of the valves is changed instantaneously, and solely by the reaction of the spring *n*, without requiring any power after the toggle has passed its center.

The arms H, connect by a link I, and by a chain J, with the piston K, which moves freely in the cylinder being packed water tight by means of leather in the usual manner. I have employed a chain constructed of several long links which open and close in the manner of lazy tongs, but any other chain or flexible connection between the piston and the link I, will serve my purpose. The end of the chain is secured to an eye bolt L, which is fastened in the center of the piston lengthening and shortening as the piston moves to or from the toggle. When the piston K is moved in the direction of arrow 1, the chain J, is stretched and by pulling on the link I, the position of the arms H, and G, and with them the position of the valves is changed.

A vertical plate or tappet M, is firmly secured to the top of the link I, and a screw rod N, which is fastened in the piston K, strikes against this tappet if the piston moves in the direction of arrow 2 and by these means the position of the arms H and

G, and consequently that of the valves is changed in the opposite direction. The length of the screw rod is adjusted by means of a nut *o*.

5 The operation is as follows: In the position shown in Fig. 1, in the drawing the water enters through the supply pipe *h*, and through the opening *h*, and passages *b* and *a*, to one side of the piston as indicated by
10 the red arrows, and it discharges through the passages *a' b'* opening *h'*, and passage *i'*, as indicated by blue arrows. The piston moves in the direction 1, and it has arrived nearly in the extreme position of its stroke
15 in this direction. By moving the piston a little farther in the same direction, the strain exerted by the chain J, on the arms H, causes the valves to change their position. After the valves have changed the
20 water enters through the opening *g'*, chamber *c'*, and passages *b'* and *a'*, to the rear end of the cylinder and the piston moves in the direction of arrow 2 and the water which previously collected in the front end
25 of the cylinder, discharges through the passages *a b*, opening *g*, and passage *i*. As the piston approaches the end of its stroke in the direction of arrow 2, the adjusting screw N, comes in contact with the tappet
30 M, and the toggle arms are forced in the direction of the arrow 2, until they pass their center and the rod *n'*, by the action of the spring *n*, is thrown violently against the prong *m'*, of the forked lever F, causing the

same to change the position of the valves. 35
It will be easily understood how by changing the length of that portion of the adjusting screw N, which projects in front of the piston, the quantity of water flowing into the rear end of the cylinder until the change 40
of the valves is effected can be regulated. The manner in which the water flows through the valves and through the several passages of my meter is such that no sediment can collect in any of the working 45
parts, as the current of the water in returning will wash off all the dirt which may enter the valve, the chamber or the cylinder with the supply water, and all the parts of my meter are so arranged that they can not 50
easily get out of repair and that they can easily be reached by removing the head of the cylinder.

What I claim as new and desire to secure by Letters Patent, is— 55

The employment of the four puppet valves C, C, D, D, arranged upon one shaft within a pipe or chamber having four partitions *e, e', f, f'*, against the sides of which said valves are alternately seated, in combination with the piston K, all substantially 60
as herein shown and described for the purpose set forth.

GERARD SICKELS.

Witnesses:

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