



A. LANGLAIS.

GAS METER.

No. 386,994.

Patented July 31, 1888.

Fig. 3.

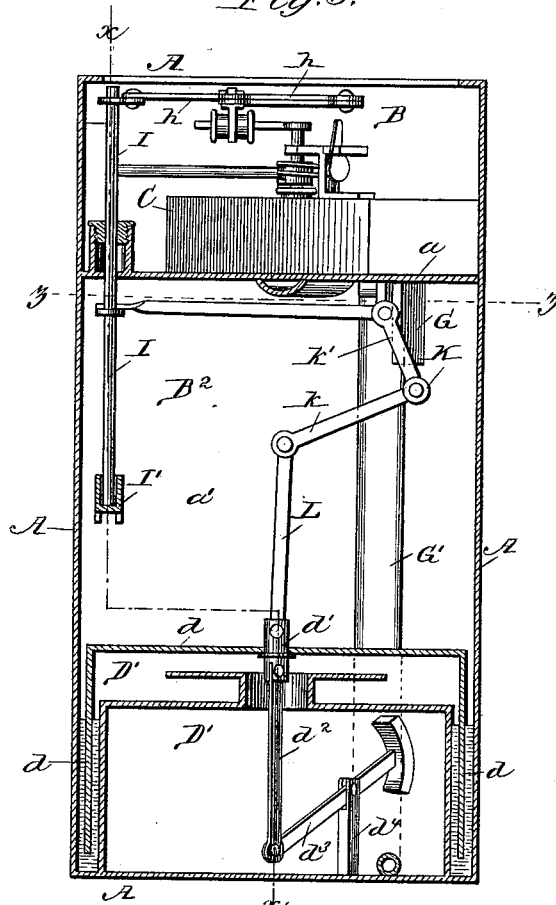
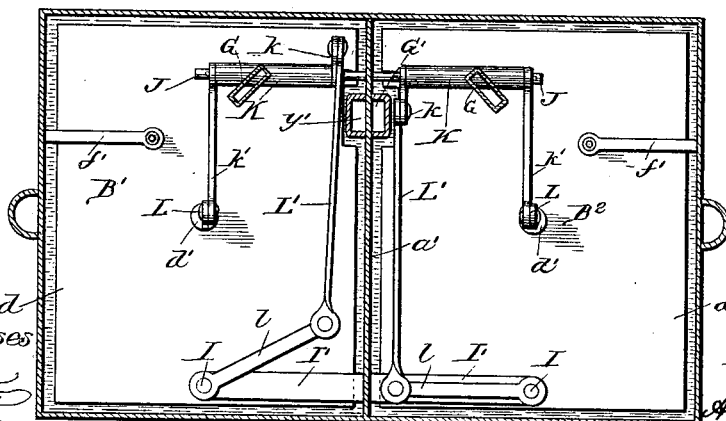


Fig. 4.



Witnesses  
N. G. Foster  
J. M. Whipple.

Inventor:  
Archie Langlais.  
By Merriman & Whipple.  
Atty's.

# UNITED STATES PATENT OFFICE.

ARCHIE LANGLAIS, OF CHICAGO, ILLINOIS.

## GAS-METER.

SPECIFICATION forming part of Letters Patent No. 386,994, dated July 31, 1888.

Application filed February 13, 1888. Serial No. 263,834. (No model.)

*To all whom it may concern:*

Be it known that I, ARCHIE LANGLAIS, of Chicago, Illinois, have invented certain new and useful Improvements in Gas-Meters, of which the following is a specification.

My invention relates to improvements in gas-meters in which a liquid-joint is employed to connect the movable part of the expansible chamber with the relatively-stationary part thereof; and the object of my improvement is to simplify the construction and arrangement of the expansible chamber and its connection with the registering mechanism, thereby making a more compact and better apparatus than has heretofore been produced. The object is also to provide means for preventing the liquid from being spilt into the expansible chamber by tipping the meter over or turning it upside down.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a right-side vertical section of a meter containing the invention, taken on the line *xx* of Fig. 3. Fig. 2 is a top view, the top plate of the outer casing being removed. Fig. 3 is a left-side transverse vertical section on line *yy* of Fig. 1. Fig. 4 is a horizontal section on line *zz* of Fig. 3.

A is the outer casing, which is constructed of sheet metal and made air-tight in the usual manner. The space inclosed by the casing is divided into three compartments, B B' B<sup>2</sup>, by partitions *a a'*. The compartment B has the valve-chambers C provided with sliding valves *c c'* of the usual construction.

D and D' are the expansible chambers, which are located within the lower part of the compartments B' B<sup>2</sup>. Each of these expansible chambers consists of an inverted cup, *d*, the sides of which play in a recess or channel, E, formed between the interior of the outer casing, A, and the exterior of an inner cup, *e*, which is of less diameter and height than the inverted cup and is attached to the bottom of said outer casing, so that any liquid—as glycerine or mercury—poured into said compartments will settle in said channel and form a gas-tight joint at the open end of said inverted cup, in which the sides of said cup can move as the expansible chamber is expanded and contracted in operation.

In order to prevent the liquid from spilling, the inner vessel, *e*, is provided with a cover, *e'*, which has an opening in the center, for a purpose hereinafter explained, which is protected by a tube or neck, *e<sup>2</sup>*, connected to the cover, so as to form a liquid-tight joint therewith, and having a flange, *e<sup>3</sup>*, at the top adapted to prevent the liquid from passing through said opening in the cover in case the meter is upset.

It is desirable to have the channel E as narrow as possible. I have therefore made the cups without any projections at the sides for connecting guide-rods, and provided them each with a rod, F, which is rigidly attached thereto at *f*. The upper parts of these rods work in an opening in an arm or projection, *f'*, and the lower parts in an opening through the flange *e<sup>3</sup>* and cover *e'* to guide the movement of the cups in operation. The openings in the cover and flange are protected by a tube, *e<sup>4</sup>*, secured so as to prevent the liquid from going through if the meter were turned over. The ports through which the gas passes into and out of the compartments B' B<sup>2</sup> are provided with pendent tubes G, which are attached to the plate *a* around the ports, so as to prevent the liquid from passing into the valve-chamber if the meter were inverted.

The liquid is thus confined within the compartments B' B<sup>2</sup> and the channels E at the bottom thereof when the meter is right side up, and will flow back into said channels on righting the meter in case it is spilled by upsetting it. The cups *d* are provided with a stud, *d'*, which extends through the plate, so as to project on both sides of the plate. This stud is located at the center of the cup and rigidly attached thereto, and to a projection on the inside of the cup there is hinged a rod, *d<sup>2</sup>*, and to the lower end of the rod is pivoted one end of a lever, *d<sup>3</sup>*, which is fulcrumed on a post, *d<sup>4</sup>*, and weighted at the other end, so as to balance the cup, said rod working through the opening surrounded by the neck *e<sup>2</sup>*.

The mechanism in the compartment B, for operating the valves *c c'* and the register, (not shown,) consists of the shafts H and H', connected by a worm-gear, said latter shaft being operated by links *h h*, connecting its crank with the arms *h'* of the rock-shafts I, all of which

are of the ordinary construction. Said shafts I are extended through stuffing-boxes supported on the plate *a* into the compartments B' B<sup>2</sup>, where they are supported by and journaled in a bar, I, attached to the partitions *a'* and the side of the casing. Opposite to this bar is a rod, J, supported on and projecting from each side of the partition *a'*. On this rod are placed sleeves K, provided with bell-crank arms *k k'*, to the latter of which are pivoted rods or links L, connected, also, with the studs *d'* of the expansible chamber, whereby the vibrations of the latter impart a rocking movement to the sleeves K. The rocking movement is transmitted, by means of the arms *k'*, through links L' and arms *l*, to the shafts I, for the purpose of operating the register by the expanding and contracting of the expansible chambers.

The connections of the rod L and the rod *d'* to the opposite ends of the stud *d'* is by hinges set in intersecting planes, so that the flexion of said rod shall be through intersecting planes coincident with the axis of the stud. The opposite ends of the rods are thus permitted to move laterally in harmony with their lever-connections, and said two rods and stud, taken together, have substantially a rigid or inflexible connection with the cup, and tend to steady it in its movement up and down.

The gas passes into the meter through the pipes M *m*, first to the valve-chambers, thence through ports controlled by the valves *cc'* alternately into chambers B' D and B<sup>2</sup> D', through the pipes G G', and thence out through the pipes *m' M'* to the burners, the valves operating in the usual manner to open and close the ports to said pipes G and G' and to admit the gas from said chambers in each side of the meter to said pipe *m'*.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a gas-meter constructed as shown, the combination, with the cups *d* of the expansible chamber, of the inner cups, *e*, provided with a cover, *e'*, having an opening in the center provided with a neck, *e<sup>2</sup>*, and flange *e<sup>3</sup>*, as and for the purpose specified. 45

2. In a gas-meter of the construction shown, the cup *d* of the expansible chamber provided with a stud, *d'*, in combination with the rods L and *d'*, said rods being hinged to opposite ends of said stud, so as to be flexible through intersecting planes coincident with said stud, and weighted levers *d<sup>3</sup>*, as and for the purpose specified. 50 55

3. In a gas-meter constructed as shown and described, the cups *d* of the expansible chamber provided with a rod, F, rigidly attached at *f* and extended in opposite direction from said point, in combination with an arm, *f'*, and the cover *e<sup>2</sup>* and its flange provided with openings in which said rod can move to guide the movement of the cups, as specified. 60 65

4. In a gas-meter constructed as shown and described, the cups *d* of the expansible chamber balanced by a weight-pressed rod connected in the center and guided by a single rod rigidly attached to the top plate and sliding in openings above and below its point of attachment to the cup, in combination with links L, bell-crank sleeve K, provided with arms *k k'*, links L', and arms *l* of the shafts I, as and for the purpose specified. 70

ARCHIE LANGLAIS.

Witnesses:

JNO. H. WHIPPLE,  
JAMES R. DEAN.