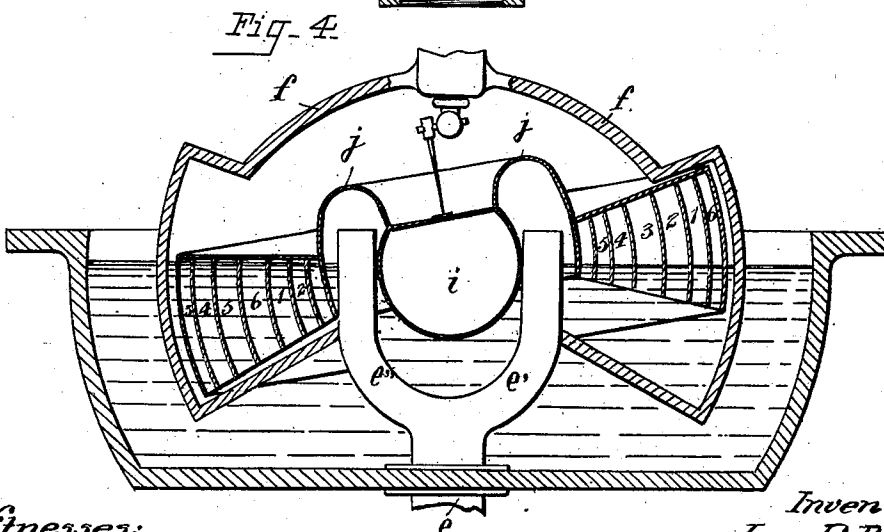
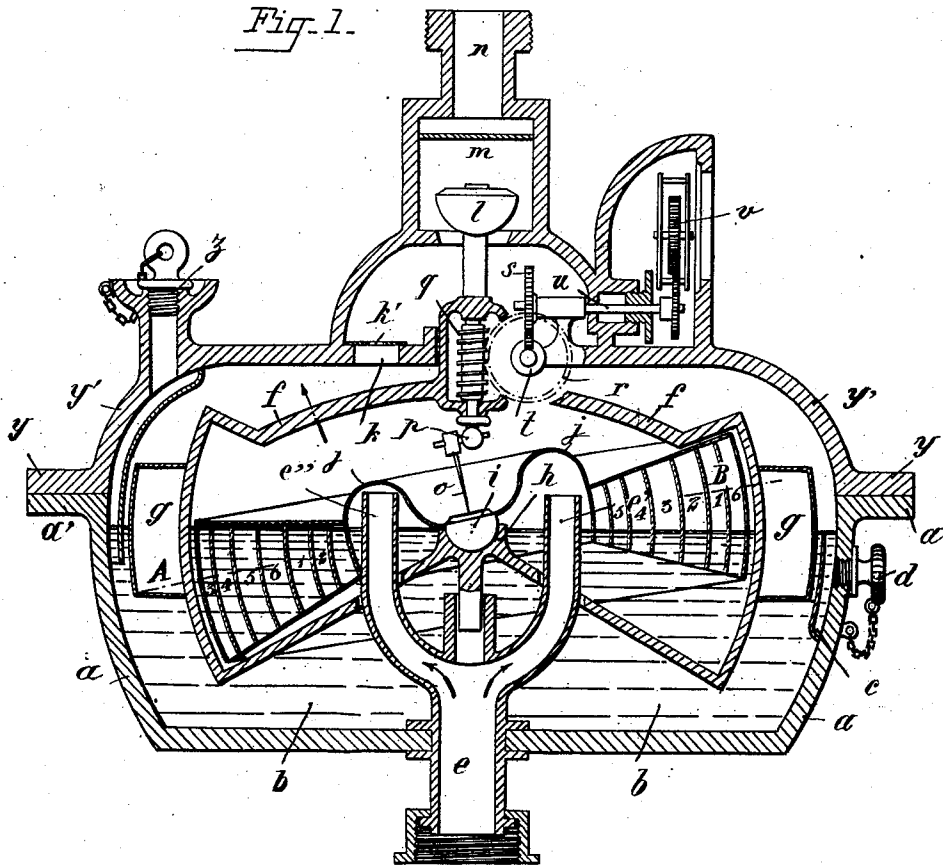


J. R. DUPOY.
GAS METER.

(Application filed Apr. 24, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
Paul Runtz
Waldemar B. Kampffort

Inventor,
Jean R. Dupoy
 By *Munn*
 Attorneys

No. 715,564.

Patented Dec. 9, 1902.

J. R. DUPOY.
GAS METER.

(Application filed Apr. 24, 1901.)

(No Model.)

2 Sheets—Sheet 2.

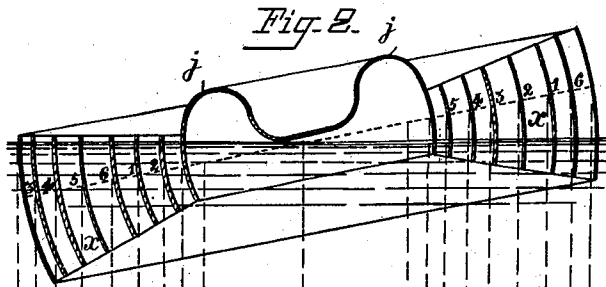
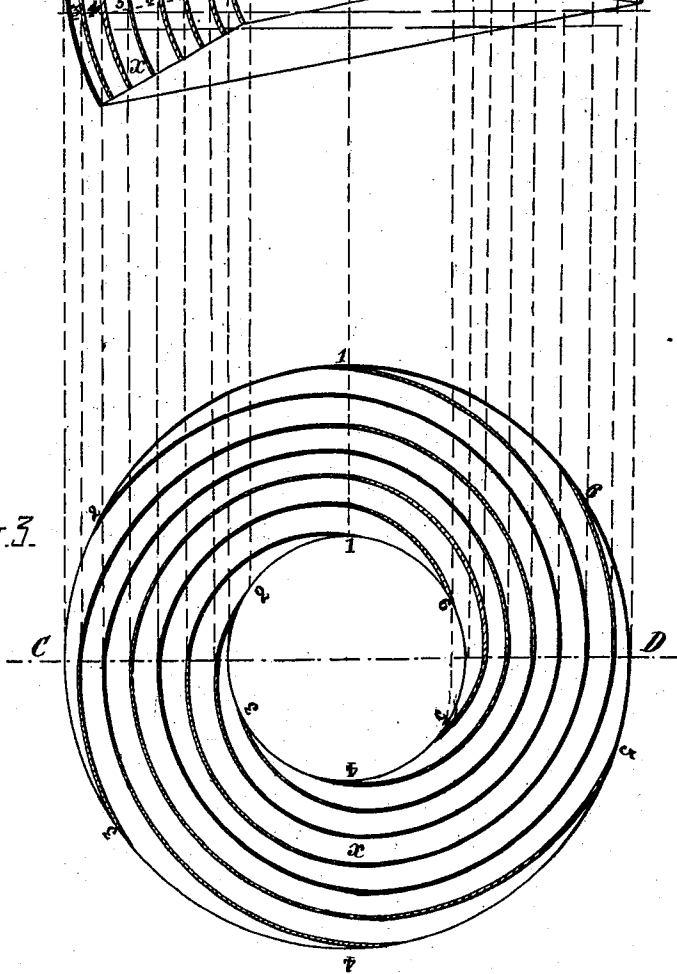


Fig. 3.



Witnesses:

Camille Kuntze

Waldemar K. Kampffert

Inventor

Jean R. Dupoy.

By *M. B.*
Attorneys

UNITED STATES PATENT OFFICE.

JEAN ROMAIN DUPOY, OF PARIS, FRANCE.

GAS-METER.

SPECIFICATION forming part of Letters Patent No. 715,564, dated December 9, 1902.

Application filed April 24, 1901. Serial No. 57,267. (No model.)

To all whom it may concern:

Be it known that I, JEAN ROMAIN DUPOY, engineer, of 36 Rue Guersant, in the city of Paris, Republic of France, have invented Improvements in Gas-Meters, of which the following is a full, clear, and exact description.

This invention relates to an improved gas-meter, which is essentially characterized by the employment of a special arrangement of oscillating bell. In this improved meter the oscillating bell is divided into compartments of spiral form extending from the center, at which the gas to be measured is admitted, toward the periphery, where the gas is delivered after measurement, the said compartments being bounded laterally by partitions having a spirally-curved surface, all the vertical sections of which form arcs of circles having for their center the point of oscillation of the bell. The bell is inclined above the plane of the liquid, and thus receives under the action of the gas a circular undulatory movement, without, however, turning upon itself, while the upper end of the spindle, which is fixed in the pivot of the bell, is caused to describe a circle. When the gas enters a compartment, that part of the same which corresponds to the point of admission of the gas is subjected to a higher pressure than that which exists in the part corresponding to the outlet, the result of these differences of pressure which are successively produced in the several compartments being a series of forces which impart to the bell an undulatory oscillating motion, whereby a movement of rotation is transmitted to the shaft driving the mechanism by which the outflow of gas is registered. In this bell-chamber the several vertical gas-spaces are for each compartment comprised between two arcs of circles concentric with the point of oscillation of the bell, so that there can never be any liquid reaction upon the bell, no deformation of the volume of gas during the oscillation of the bell, no friction, and no compression in the compartments, but, on the contrary, a slight expansion, which will assist in the delivery from the compartments. In order to insure perfect accuracy in the measuring, the bell is held in suspension in a frame carried by a balanced float, so that the cen-

ter of oscillation will always be at the level of the liquid.

My improved oscillating bell-chamber is illustrated in the accompanying drawings, 55 wherein—

Figure 1 represents a vertical section of the gas-meter. Fig. 2 is a section on line C D, Fig. 3. Fig. 3 is a horizontal section on line A B, Fig. 1. Fig. 4 is a vertical section of a 60 modified method of suspending the bell.

The same letters of reference denote like parts in the several figures.

My improved gas-meter comprises a casing *a*, containing a liquid *b*—such as oil, glycerin, 65 &c.—the casing being provided with an overflow *c*, closed by a stopper *d*, and with a gas-inlet pipe *e* at its lower part. The lower part *a* of the casing has a flange *a'*, upon which is fitted the flange *y* of the cover *y'*, which carries the registering mechanism. The cover is also provided with a filling-orifice closed by a stopper *z*. Within the casing beneath the cover is mounted a skeleton frame *f*, so as to allow the liquid to pass in and to pass out 75 of said frame. The frame, which is of annular form, is supported by a peripheral annular float *g*, whereby to maintain the bell in suspension. The frame *f* has a central socket *h* to receive a spherical pivot *i*, upon which 80 as an axis the oscillating bell *j* is supported and oscillates. This oscillating bell is divided into six, as shown, or other number of compartments *x* of spiral form, the divisions between the several compartments presenting a curved spiral surface, which in vertical 85 section are curved to arcs of circles concentric with the point of oscillation of the bell, as shown in Fig. 3, so as to absorb in work only the friction of the compartments and 90 not of the acting surfaces. The above-described construction tends to always maintain the apparatus in such position that the center of oscillation of the bell is found in the plane of the level of the liquid. It will 95 be seen from Figs. 2 and 3 that the admission to each compartment ceases before the exit-orifice emerges above the level of the liquid. The gas entering the meter by pipe *e* passes up through the branch pipes *e'* *e''*, which extend 100 above the level of the liquid, and on entering a compartment *x* exerts a pressure in

this compartment, which at its extremity is only subjected to the outlet-pressure, the resultant of these pressures having for effect to communicate to the bell an angular oscillating movement. The successive entrance of gas into the different compartments produces a series of successive forces which communicate to the bell a circular undulatory movement. The space filled by the gas goes on increasing in capacity until the moment when by the immersion of the inlet end of the compartment in the liquid the gas can no longer enter; but the gas continues its action upon the next following compartment, and so on. The gas after thus acting upon the bell fills the space beneath the cover, passes through orifice *k*, beneath valve *l*, forming part of the float mechanism, through orifices in the protecting-disk *m*, and thence through outlet *n* into the service-pipe. The outlet-orifice *k* is regulated by a diaphragm *k'*, having an orifice corresponding to the output of the meter at normal speed. The circular undulatory movement of the bell is transmitted by the arm *o* and crank *p*, which receives circular movement, to a screw *q*, driving a worm-wheel *r*, which by means of another screw *q* drives a wheel *s*, fast on a spindle *u*, which drives the train of gearing of the counter *v*, whereby the supply of gas is registered. The liquid-level having been produced by the introduction of a permanent liquid, the plug *z* of the filling-orifice is sealed, and likewise the plug *d* of the overflow. Should the level be accidentally altered, the position of the float will be altered to the same extent and the transmission of movement from *q* to *t* will be effected within the limits of this change of position. The position of the float system is limited in the upward direction by the height of the inlet-orifices of the gas and in the downward direction by the outlet-valve.

In Fig. 4 I have shown a modification of the mode of suspension of the bell, in which the pivot *i* is itself the float.

In my improved meter the liquid employed is never in communication with the atmosphere, and consequently the proper working of the apparatus is constantly insured, whatever may be the pressure of the gas to be measured.

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

1. An oscillating bell for gas-meters divided into compartments of spiral form extending from the center at which the gas to be measured is admitted toward the periphery where the gas is delivered after having been measured, the said compartments being laterally bounded by partitions having a spirally-curved surface all the vertical sections of which form arcs of circles having for their center the point of oscillation of the bell, the latter being held in suspension within a frame supported by a float so balanced that the cen-

ter of oscillation will always be at the level of the liquid in order that during the oscillation of the bell, there cannot be any liquid reaction, any deformation and any compression of the gas, substantially as described.

2. A driving member for gas-meters, consisting of a receptacle mounted to have circular undulatory movement and divided into compartments of spiral form, the divisions between adjacent compartments in axial section being arcs of circles concentric with the center of movement of the receptacle.

3. A driving member for gas-meters consisting of a float-supported receptacle, mounted to have circular undulatory movement and provided with a plurality of compartments, the divisions between the compartments being curved to arcs of circles concentric with the point of oscillation of the bell to form spiral compartments, as set forth.

4. A gas-meter, comprising a casing adapted to contain a liquid, a float-supported receptacle mounted in the casing to have circular undulatory movement and provided with spiral compartments, the divisions between the compartments in axial section being arcs of circles concentric with the center of movement of the receptacle, a registering device and means for operating the registering device from the pivot of the receptacle, as set forth.

5. A gas-meter, comprising a casing adapted to contain a liquid, a float-supported frame in the casing and having guided movement therein, a receptacle pivotally mounted in the frame to have circular undulatory movement, said receptacle having spiral compartments, the divisions between the compartments in axial section being arcs of circles concentric with the center of movement of the receptacle, a registering device, and a driving connection between the pivot of the receptacle and registering device, as set forth.

6. A gas-meter, comprising a casing adapted to contain a liquid and having an inlet and outlet, a float-supported frame in the casing and having guided movement therein, a valve carried by the frame and controlling the outlet of the casing, a bell mounted in the frame to have circular undulatory movement and provided with spiral compartments, a registering device, and means for operating the latter from the bell, as set forth.

7. A gas-meter, comprising a casing adapted to contain a liquid and having an inlet and outlet, the inlet extending into the casing and having a forked end, a float-supported frame mounted in the casing and into which the forked end of the inlet projects, said frame having a central socket, a valve carried by the frame and controlling the outlet of the casing, a bell having its pivot seated in the socket of the frame and from which pivot an arm projects, said bell being provided with spiral compartments, a registering device, and means for operating the latter from the arm of the pivot of the bell, as set forth.

8. A gas-meter, comprising a casing adapted to contain a liquid and having an inlet and outlet, a float-supported frame in the casing and having guided movement on the inlet of the casing, a valve carried by the frame and controlling the outlet, a bell pivotally mounted in the frame to have circular undulatory movement and provided with spiral compartments, the pivot of the bell being provided with an arm projecting therefrom, a registering device, and operating means between the arm of the pivot of the bell and the registering device, as set forth.

9. A gas-meter, comprising a casing adapted to contain a liquid, a frame provided with a float for supporting it in the casing, a bell having compartments in spiral form and pivoted in the frame by a spherical pivot to have circular undulatory movement, an arm projecting from the pivot of the bell, a screw mounted in the frame and provided at one end with a crank with which the arm of the

pivot is connected, a registering device, and gearing between the screw and registering device, as set forth.

10. A gas-meter, comprising a casing adapted to contain a liquid, a frame in the casing and provided with a float, and carrying a valve adapted to be seated on a seat in the upper part of the casing, a bell pivoted in the frame to have circular undulatory movement and provided with spiral compartments, a screw mounted in the frame and connected with the pivot of the bell to be operated thereby, and a registering device operated from said screw, as set forth.

The foregoing specification of my improvements in gas-meters signed by me this 5th day of April, 1901.

JEAN ROMAIN DUPOY.

Witnesses:

EDWARD P. MACLEAN,
MAURICE H. PIGNET.