

T. JACKSON.
GAS METER.

APPLICATION FILED AUG. 27, 1914.

1,148,779.

Patented Aug. 3, 1915.

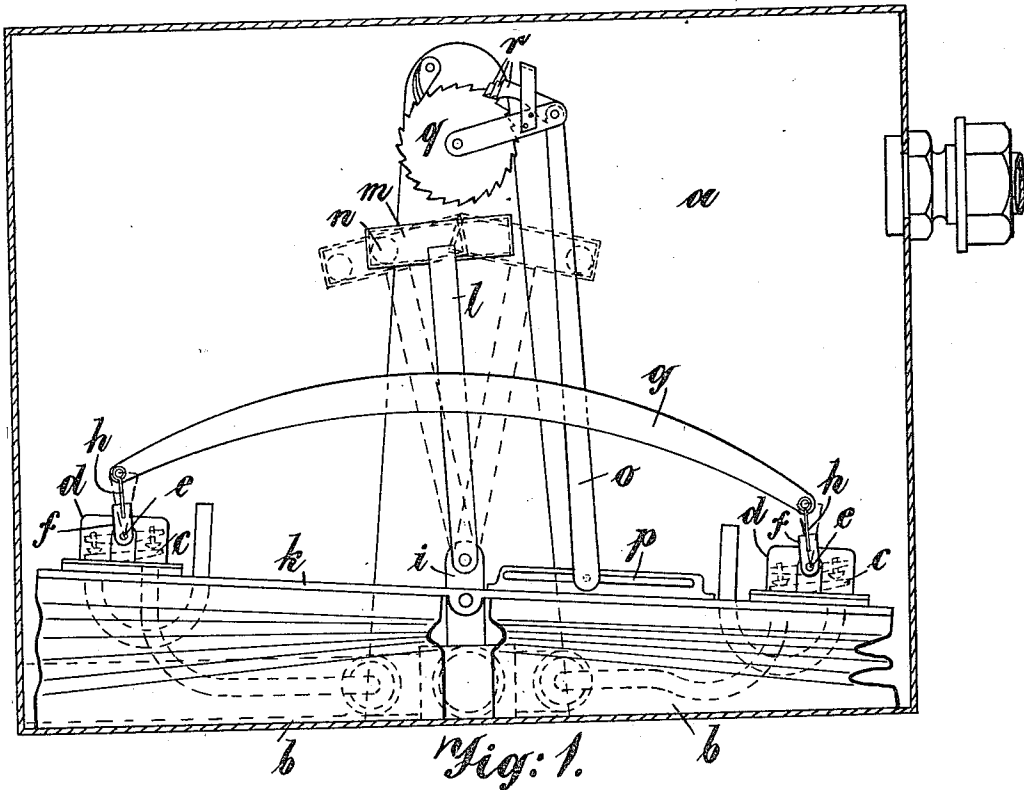


Fig. 2.

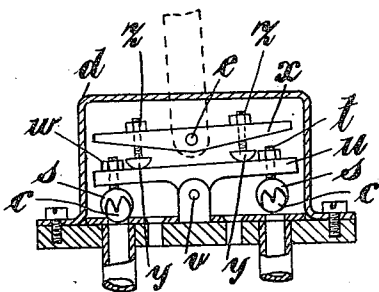
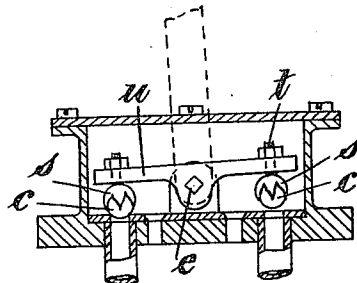


Fig. 3.



WITNESSES:
Martin B. Cothreep
Mort J. Neuman

INVENTOR
Thomas Jackson
By M. Wallace White
ATTORNEY

UNITED STATES PATENT OFFICE.

THOMAS JACKSON, OF LONDON, ENGLAND, ASSIGNOR TO ALLAN RAMSAY, OF CHESHAM, ENGLAND.

GAS-METER.

1,148,779.

Specification of Letters Patent.

Patented Aug. 3, 1915.

Application filed August 27, 1914. Serial No. 858,890.

To all whom it may concern:

Be it known that I, THOMAS JACKSON, subject of the King of Great Britain and Ireland, residing at 7 Milton Court road, New Cross, London, S. E., England, have invented new and useful Improvements in Gas-Meters, of which the following is a specification.

My invention relates to gas meters and has for its object the construction and arrangement of such a device in a simple manner, at low cost, having a high degree of accuracy, great facility of adjustment and increased simplicity of manufacture and assembly of parts.

This invention consists of an expansible and contractible chamber, the moving wall of which takes up an angular disposition during the expansion and contraction of the chamber which ranges from a + angle with the horizontal line past a point of zero angularity to a - angle with the horizontal line. Upon this moving wall is mounted directly a valve arrangement controlled by gravity during the consequent tilting of the valve box so that the supply of gas and discharge of it from the said chamber are alternately effected. The reciprocating or oscillating motion of the said chamber wall is utilized to operate by means of a ratchet and pawl arrangement or equivalent device, a counting mechanism registering the number of reciprocations and consequently the amount of the gas passed through the chamber. In order to reduce the error of registration or in other words to reduce the lost motion in the transmission gear, teeth of small pitch are used on the ratchet wheel, and multiple pawls having a range of disposition of their engaging edges equal to the pitch of the teeth are arranged to act on the ratchet wheel. It will be seen that in this way the angular movement of the wall of the chamber and consequently the change of volume of the same can be accurately transmitted to the counting mechanism. If only one chamber is used, a yielding force must be employed for the gas pressure to act against in expanding the chamber the said yielding force operating to cause the

chamber to contract when the gas supply is cut off and the contained gas is to be delivered for use. If two or more chambers be used they can be arranged to act one against the other so that the incoming gas is used directly to force the outgoing gas from the device instead of this being done indirectly through the medium of said yielding force.

Referring to the drawings which form part of this specification:—Figure 1 is a sectional view of a meter case containing the improved mechanism which is shown in elevation. Fig. 2 is a sectional view of a modified form of valve mechanism. Fig. 3 is a similar view of a further modification.

To carry the invention into effect within the meter case *a* I arrange an expansible chamber or chambers *b* having a valve box *d* mounted on the moving wall *k* of each expansible chamber *b*. A gravity controlled device for controlling the valves *c*, is situated outside the valve box or boxes *d* and actuated by the reciprocation of the moving wall or walls *k* of the said expansible chamber or chambers *b*. The valves *c* rock about an axis and are operated by a spindle *e* passing to the outside of the valve boxes *d*, attached to an arm *f*. This arm is pivotally attached to one end of a connecting bar *g*, preferably by a spring element *h* so as to set up a certain amount of resiliency between the parts connected. Pivoted either on the support *i* fixedly mounted on the casing *a* or equivalently on the movable part *k* of the chambers *b* is a lever *e* connected to the bar *g*, and carrying a weight *m* at its upper end, and adapted to pass a point of unstable equilibrium from side to side so that after such point has been passed the action of gravity on the weight *m* will continue the movement of the bar *g*. In order to make the parts very sensitive a moving weight *n* is disposed in or upon the weight *m* so as to move from side to side when passing the point of unstable equilibrium in order to increase the moment of gravity about the axis of the lever *l*. In the drawing the weight *m* is shown in the form of a tube, and the rolling element *n* is shown as a

ball, but it is obvious that there are other ways of arranging these two elements in order to produce the desired effect. The weight m is shown in the position which it has arrived at from one terminal position shown in dotted lines on the left, just before it reaches the point of unstable equilibrium, which, when passed will enable gravity to carry the lever l into the right hand dotted position so as to open and close the valves c on each chamber respectively. It will be noticed that when the weight m arrives at either terminal dotted position, a shock is likely to be created by the valves coming on their seat suddenly, and to avoid this, and to insure absolute closure of the two valves c on each chamber b , the spring h , or other equivalent resilient element is provided in the train of operating mechanism. The number of operations of the chamber b is registered in known manner by a connecting rod o , adjustable on its lower end as to its point of pivoting, by means of a slot p , the upper end operating the counting mechanism q by ratchets r in the manner well understood.

Referring to Figs. 2 and 3 in order to provide means of adjustment for varying the lift of the valves, and to insure that the valves co-act with their seatings at any point of adjustment, the valves c are formed of balls, each ball c being held in a cage s carried on a screwed stem t and mounted on a rocking arm u pivoted about a fixed axis v . Each stem t can be screwed up and down in the rocking arm u and be locked in position by a lock nut w . In order to provide a supplemental adjustment a second rocking arm x may be arranged which is directly connected to the spindle e and which carries adjustable contact studs y which are screwed into the arm x and locked in place by lock nuts z .

It will be seen that the volumetric capacity of the chambers b can be varied with great nicety by the adjustment of the valves c relative to their seatings, and by the supplemental adjustment of the stud y where such is provided.

I claim:

1. A gas meter having, in combination, an expansible and contractible measuring chamber or chambers each having a movable wall, gravity-controlled valve-operating mechanism mounted upon an axis, a supplemental weight adapted to augment the action of the gravity-controlled valve-operating mechanism when the said supplemental weight is caused to pass a point of unstable equilibrium, a valve box on the movable wall of each measuring chamber, two valves in each valve box for controlling the gas admission and exit therefrom, connecting means from said operating mechanism to said

valves to open and close them alternately, a counting mechanism and means operated by one of the said movable walls of the said measuring chamber adapted to register each volumetric movement of the said chamber wall, substantially as described.

2. A gas meter having in combination an expansible and contractible measuring chamber or chambers each having a movable wall, a gravity controlled valve operating mechanism comprising a pivoted lever, a movable weight carried at the upper end thereof and adapted to move relatively to said lever under the action of gravity when the lever passes the point of unstable equilibrium, a valve box on the movable wall of each measuring chamber, two valves in each valve box for controlling the gas admission and exit therefrom, connecting means from said operating mechanism to said valves to open and close them alternately, a counting mechanism and means operated by one of the said movable walls of the said measuring chamber adapted to register each volumetric movement of the said chamber wall, substantially as described.

3. A gas meter having, in combination, an expansible and contractible measuring chamber or chambers each having a movable wall, gravity-controlled valve-operating mechanism mounted upon an axis, a supplemental weight adapted to augment the action of the gravity-controlled valve-operating mechanism when the said supplemental weight is caused to pass a point of unstable equilibrium, a valve box on the movable wall of each measuring chamber, two valves in each valve box for controlling the gas admission and exit therefrom, flexible or resilient connecting means from said operating mechanism to said valves to open and close them alternately, a counting mechanism and means operated by one of the said movable walls of the said measuring chamber adapted to register each volumetric movement of the said chamber wall, substantially as described.

4. A gas meter having in combination an expansible and contractible measuring chamber or chambers each having a movable wall, a gravity controlled valve operating mechanism comprising a pivoted lever, a movable weight carried at the upper end thereof and adapted to move relatively to said lever under the action of gravity when the lever passes a point of unstable equilibrium, a valve box on the movable wall of each measuring chamber, two valve seatings in each valve box, valves for co-acting therewith, a rocking bar for operating said valves, adjustable means by which the angular movement can be varied for the opening and closing operations of the valves for controlling the gas admission to and exit from

the said valve box, controlling means from
said operating mechanism to said valves to
open and close them alternately, a counting
mechanism and means operated by one of
5 the said movable walls of the said measur-
ing chamber adapted to register each volu-
metric movement of the said chamber wall,
substantially as described.

In testimony whereof I have signed my
name to this specification in the presence of 10
two subscribing witnesses.

THOMAS JACKSON.

Witnesses:

WALTER CARVER,
ROBERT HUGH SHAW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."