

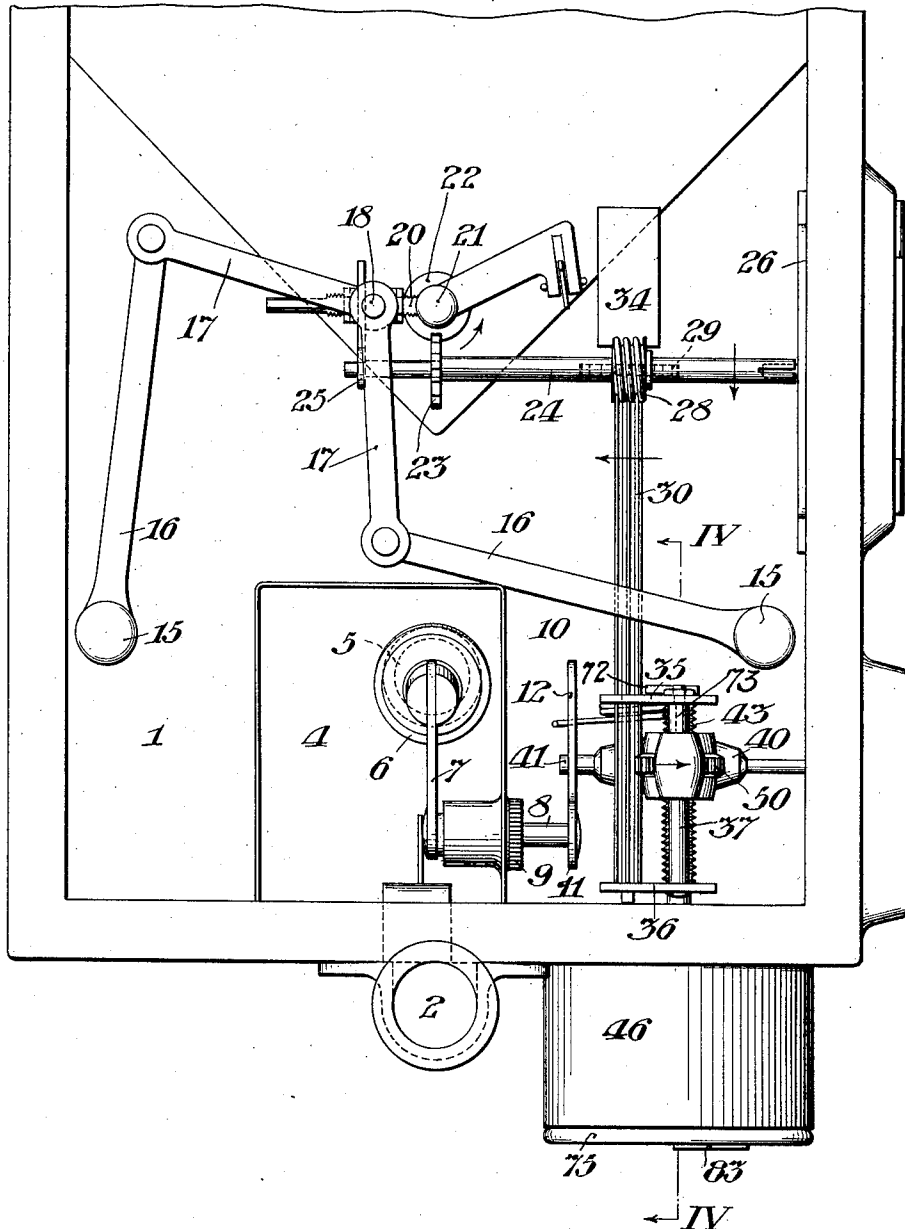
W. L. BROWN.
PREPAYMENT METER MECHANISM.
APPLICATION FILED AUG. 20, 1912.

1,063,649.

Patented June 3, 1913.

2 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

Philip W. Vessey,
James M. Cobb,

INVENTOR:

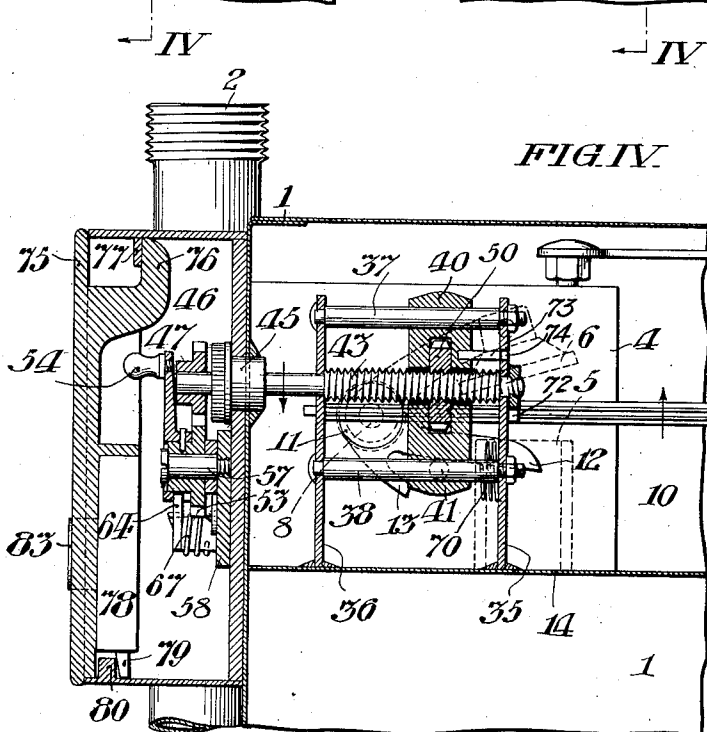
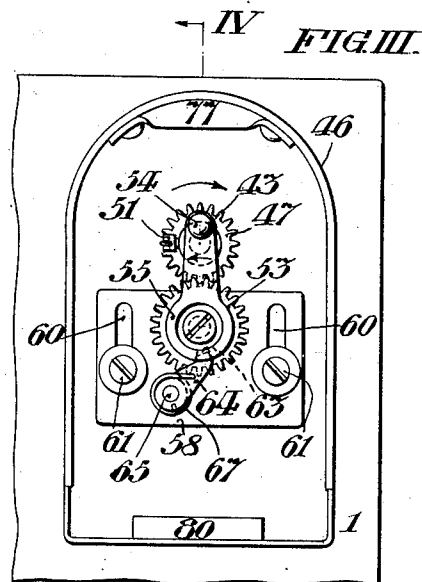
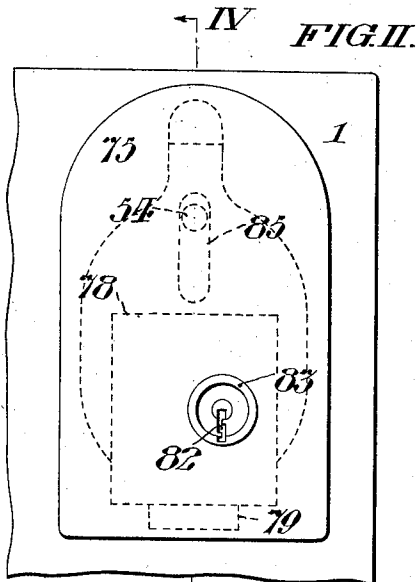
William L. Brown,
by Arthur E. Lutz,
Attorney.

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2 SHEETS—SHEET 2.



WITNESSES:
Philip W. Vessey,
James D. Cady.

INVENTOR:
William L. Brown
By Arthur C. Paige,
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM L. BROWN, OF LANSDOWNE, PENNSYLVANIA.

PREPAYMENT-METER MECHANISM.

1,063,649.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed August 20, 1912. Serial No. 715,991.

To all whom it may concern:

Be it known that I, WILLIAM L. BROWN, of Lansdowne, in the county of Delaware and State of Pennsylvania, have invented a certain new and useful Improvement in Prepayment-Meter Mechanism, whereof the following is a specification, reference being had to the accompanying drawings.

My improvement relates to vending machines, and is particularly applicable to a gas meter to permit a valve to be manually opened by mechanism inaccessible to the vendee but accessible to the vender, so that an agent of the latter may collect the prepayment and thereupon open said valve, and, sequently set the vending mechanism so that said valve shall be automatically closed by the operation of the gas meter after delivery of the quantity of gas for which prepayment has been made.

As hereinafter described, my invention includes the combination with a valve controlling the passage of gas through the meter and having an operating lever; of a pin, movable to open and close said valve by engagement with said lever, projecting from a reciprocary carriage which is in operative relation with valve closing mechanism operatively connected with the meter mechanism, and also in operative relation with valve opening mechanism including a handle exterior to the meter casing but inclosed by a box having a lock.

As hereinafter described, my invention also includes the combination with said valve controlling the passage of gas through the meter; of meter mechanism including a main arbor, operatively connected with dial mechanism; a bearing at the inner end of said arbor which may be bent axially with respect to the latter to release and permit the removal of said arbor; a screw worm on said arbor; and, a valve closing shaft having a worm gear engaging said arbor worm; whereby operation of said meter mechanism tends to thrust said arbor away from said bendable bearing.

The last named combination is advantageous in that the inner bearing of the main arbor of the dial mechanism may be readily bent aside to facilitate removal of said arbor for the purpose of adjusting or repairing the dial mechanism, and is cooperatively related to the preceding combination because the latter includes means automatically preventing reverse movement of said handle,

and means positively connecting said handle with the meter mechanism; and, consequently, if the valve closing mechanism fails to tightly close said valve when it reaches the limit of its movement, the meter mechanism continuing to be operated by gas flowing past said valve would bend the bendable bearing and displace the main arbor afore-said if the screw worm on said arbor were not so inclined that the torque thereon from said meter mechanism tends to thrust said arbor away from said bendable bearing.

My invention includes the various novel features of construction and arrangement hereinafter more definitely specified.

In the drawings:—Figure I is a fragmentary plan sectional view of a gas meter of ordinary construction, embodying my invention, only the top plate of said meter being removed. Fig. II is a front elevation of the lockable box on the exterior of the meter casing. Fig. III is an elevation of said box with the lid removed showing interior manually operative valve opening mechanism. Fig. IV is a fragmentary vertical sectional view taken on the line IV, IV in Figs. I, II and III.

In said figures; the gas meter 1 has the inlet 2 by which the gas enters the valve chamber 4, from which it may pass through the meter only by way of the port 5 under control of the valve 6 carried by the arm 7 on the rock shaft 8. Said shaft projects through the stuffing box 9 into the chamber 10, from which the gas is excluded, and has in the chamber 10 the lever 11 by which it may be operated; said lever having arms 12 and 13. The meter mechanism beneath the floor 14 of said chamber 10 is of ordinary construction, including diaphragms operatively connected with the rock shafts 15 respectively carrying the lever arms 16 pivotally connected by the links 17 with the adjustable wrist pin 18 on the crank 20. Said crank 20 is carried on the rotary shaft 21 provided with the worm 22 engaging the worm gear 23 on the dial arbor 24, which is journaled at its inner end in the bearing 25 which may be bent axially with respect to said arbor to release and permit the removal of said arbor which at its outer end is operatively connected with suitable mechanism in the dial box 26 to indicate upon the exterior of the meter the quantity of gas which has been vended. Said dial arbor 24 carries the worm 28 engaging the worm

gear 29 on the valve closing shaft 30 which is journaled in the bearing bracket 34 and in the bearing standards 35 and 36. Said standards 35 and 36 are connected by the guide rods 37 and 38 which extend through the reciprocatory carriage 40 which carries the pin 41 arranged to open and close said valve by the reciprocatory movement of said carriage. The screw shaft 43, being journaled in said standards 35 and 36, extends through said carriage 40 and projects through the stuffing box 45 in the wall of the meter 1 into the lockable box 46 where it is provided with the interchangeable price gear 47, shown in Fig. III. Said screw shaft is in threaded engagement with the nut 50 which is rotatably mounted in said carriage and has external gear teeth engaging the gear teeth on said valve closing shaft 30. Said price gear 47 is of the size employed to dispense gas at one dollar per thousand feet, each tooth thereof representing five cents. However, rotation of said screw shaft 43, in the direction of the arrow in Fig. III, to the degree of one tooth of said gear 47, shifts the carriage 40 inwardly with respect to the meter so that the pin 41 shifts the lever 11 so as to open the valve 6 so far that one cent's worth of gas must be dispensed to effect the reverse movement of said carriage by the meter mechanism operating said valve closing shaft 30. It is to be understood that interchangeable gears 47 of different sizes are provided in accordance with different prices of gas, said gears being conveniently provided with set screws 51 by which they may be detachably rigidly connected with said screw shaft 43.

As shown in Figs. III and IV said price gear 47 is engaged by the driving gear 53 having the handle 54 and ratchet 55 rotatable therewith on the stud shaft 57 carried by the bearing plate 58 in said box 46, having parallel slots 60 extending toward said screw shaft 43, and clamping means including screws 61 entered through said slots in engagement with said box; whereby, said driving gear 53 may be adjusted toward and away from the axis of said screw shaft to engage different sizes of price gears thereon. As shown in Fig. III said ratchet 55 has a single notch 63 adapted to engage the pawl 64 which is carried by said plate 58 on the pivot 65 and pressed into engagement with said ratchet by the spring 67. It may be observed that said driving gear 53 has twenty-five teeth, so that each revolution thereof in the direction of the arrow marked on the handle 54 sets the valve opening mechanism to dispense twenty-five cents' worth of gas. However, said gear 53 may be turned several successive revolutions at one time to sequently set the vending mechanism so that said valve 6 shall be automatically closed by the operation of the gas meter

after delivery of the quantity of gas for which prepayment has been made at the rate of twenty-five cents for each revolution of said gear 53. It is to be understood that said ratchet 55 and spring pressed pawl 64 cooperate to not only prevent accidental reverse movement of the valve opening mechanism but also click to audibly manifest the number of revolutions of the handle 34 and indicate the correct position in which to leave the latter; being the position shown in Fig. III.

I find it advantageous to shape the valve lever 11 as shown, so that the valve 6 may be raised from its seat and otherwise manipulated independently of said pin 41. However, such an arrangement makes it possible for said valve to be accidentally closed as said pin 41 approaches the end of its outward movement unless other means be provided to support it when the valve is no longer supported by the lever arm 12. Therefore, I provide the spring 70 which is attached at one end to the standard 35 and has its free end upholding said lever arm 12 so as to counterbalance the weight of said lever 11, arm 7 and valve 6; the free end of said spring being so set that it will not raise said lever 11 from the pin 41 when the latter is upholding said lever 11 by its arm 12. However, the combination including said valve lever and spring forms the subject matter of an invention independent of the invention herein claimed. In order to positively limit the opening movement of said screw shaft 43, I provide the latter with the stop lever 72 at the inner end thereof adjacent the bearing standard 35, and, provide said carriage 40 with the stop pin 73 which as it reaches the inner end of its traverse projects through the opening 74 in said standard 35 into the path of said stop lever 72, so that rotation of said shaft 43 is limited by the engagement of said stop lever with said stop pin. I find it convenient to provide said lockable box 46 with the removable lid 75 having at its upper end the lug 76 engaging the lug 77 in said box and having at its lower end the lock 78, the bolt 79 of which engages the lug 80 at the bottom of said box when said bolt is in the locked position; it being understood that said lock 78 may be of any convenient construction including mechanism whereby said bolt 79 may be projected and retracted by a key inserted in the key hole 82 which extends through the nose 83 of said lock 78 which is conveniently of the rotary cylinder type as indicated in Fig. II.

Although as above described the normal position of the handle 54 is determined by the pawl 64 engaging the notch 63, I prefer to provide other means to insure that said handle shall be in the normal position before said box 46 can be locked. Therefore, I

provide said lid 75 with the slot 85 which is adapted to receive said handle 54 only when the latter is in its normal position, so that it is impossible to close said box 46 by the lid 75 when said handle is out of its normal position. It may be observed that said slot 85 is of such length as to permit of the vertical adjustment of the plate 58 incident to the employment of price gears 47 of different sizes. Moreover, if the valve closing mechanism fails to tightly close said valve 6 when it reaches the limit of its movement, the meter mechanism continuing to be operated by gas flowing past said valve would tend to turn the screw shaft 43, price gear 47 and handle 54 in the direction of the arrows shown in Fig. III, being the direction in which said handle is manually operated and free to turn with respect to the pawl 64. Therefore, said slot 85 not only serves to insure that the handle 54 shall be in proper position before the lid 75 is closed but also serves to retain said handle against accidental displacement by the abnormal operation of the meter mechanism above contemplated.

It is to be understood that I do not desire to limit myself to the precise details of construction and arrangement herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of my invention as defined in the appended claims.

I claim:—

1. In a prepayment gas meter, the combination with a valve controlling the passage of gas through the meter and having an operating lever; of a reciprocatory carriage, carrying a pin, movable to open and close said valve by engagement with said lever; a guide for said carriage; a screw shaft extending through said carriage parallel with said guides; a stop lever carried by said screw shaft at the inner end thereof, and a stop pin carried by said carriage adapted to project in the path of said stop lever; whereby, the opening movement of said carriage is limited by the engagement of said stop pin with said stop lever.

2. In a prepayment gas meter, the combination with a valve controlling the passage of gas through the meter and having an operating lever; of a reciprocatory carriage, carrying a pin, movable to open and close said valve by engagement with said lever; a guide for said carriage; a screw shaft parallel with said guide; a nut on said screw shaft rotatably mounted in said carriage and having external gear teeth; a valve closing shaft having a gear with which said nut gear is continually engaged despite its reciprocatory traverse on said screw shaft; an interchangeable price gear on said screw shaft exterior to the meter casing; a box inclosing said price gear, having a lid pro-

vided with a lock; a bearing plate in said box having a stud shaft; a driving gear on said stud shaft, engaging said price gear; a handle and a ratchet rotatable with said driving gear; and, a pawl adapted to engage said ratchet and prevent reverse movement of said handle; said plate being adjustable and having clamping means; whereby said driving gear may be adjusted toward and away from the axis of said screw shaft to engage different sizes of price gears thereon.

3. In a prepayment gas meter, the combination with a valve controlling the passage of gas through the meter and having an operating lever; of a reciprocatory carriage, having means to open and close said valve by engagement with said lever; a guide for said carriage; a screw shaft parallel with said guide; a nut on said screw shaft rotatably mounted in said carriage and having external gear teeth; a valve closing shaft having a gear with which said nut gear is continually engaged despite its reciprocatory traverse on said screw shaft; a price gear on said screw shaft exterior to the meter casing; a lockable box inclosing said price gear; a driving gear engaging said price gear; a handle and a ratchet rotatable with said driving gear; and, a pawl adapted to engage said ratchet and prevent reverse movement of said handle.

4. In a prepayment gas meter, the combination with a valve controlling the passage of gas through the meter; of a reciprocatory carriage, having means to open and close said valve; a guide for said carriage; a screw shaft parallel with said guide; a nut on said screw shaft rotatably mounted in said carriage and having external gear teeth; a valve closing shaft having a gear with which said nut gear is continually engaged despite its reciprocatory traverse on said screw shaft; a price gear on said screw shaft exterior to the meter casing; a lockable box inclosing said price gear; a driving gear engaging said price gear; a handle and a ratchet rotatable with said driving gear; and, a pawl adapted to engage said ratchet and prevent reverse movement of said handle.

5. In a prepayment gas meter, the combination with a valve controlling the passage of gas through the meter; of a reciprocatory carriage, having means to open and close said valve; a guide for said carriage; a screw shaft parallel with said guide; a nut on said screw shaft rotatably mounted in said carriage and having external gear teeth; a valve closing shaft having a gear engaged by said nut gear; a price gear on said screw shaft exterior to the meter casing; a lockable box inclosing said price gear; a driving gear engaging said price gear; a handle and a ratchet rotatable with

said driving gear; said ratchet having but one notch; and, a pawl adapted to engage said ratchet notch and prevent reverse movement of said handle.

5 6. In a prepayment gas meter, the combination with a valve controlling the passage of gas through the meter; of a reciprocatory carriage, having means to open and close said valve; a guide for said carriage; a screw
10 shaft parallel with said guide, extending exterior to the meter casing; a nut on said screw shaft rotatably mounted in said carriage and having external gear teeth; a valve closing shaft having a gear engaged
15 by said nut gear; a lockable box inclosing the outer end of said screw shaft; a handle in said box; changeable gearing in said box operatively connecting said screw shaft with
20 said handle; and, a pawl and ratchet arranged to prevent reverse movement of said handle.

7. In a prepayment gas meter, the combination with a valve controlling the passage of gas through the meter; of a reciprocatory
25 carriage, having means to open and close said valve; a guide for said carriage; a screw shaft parallel with said guide, extending exterior to the meter casing; a nut on said screw shaft rotatably mounted in said carriage and having external gear teeth; a
30 valve closing shaft having a gear engaged by said nut gear; a lockable box inclosing the outer end of said screw shaft; a handle in said box; means in said box operatively
35 connecting said screw shaft with said handle; and, means arranged to prevent reverse movement of said handle.

8. In a prepayment gas meter, the combination with a valve controlling the passage
40 of gas through the meter; of a reciprocatory carriage, having means to open and close said valve; a guide for said carriage; a screw shaft parallel with said guide, extending exterior to the meter casing; a nut on said
45 screw shaft rotatably mounted in said carriage and having external gear teeth; a valve closing shaft having a gear engaged by said nut gear; a lockable box inclosing the outer end of said screw shaft; a handle
50 in said box; and, means in said box operatively connecting said screw shaft with said handle.

9. In a prepayment gas meter, the combination with a valve controlling the passage

of gas through the meter; of a reciprocatory 55 carriage, having means to open and close said valve; a screw shaft extending exterior to the meter casing; a nut on said screw shaft operatively connected with said carriage and having external gear teeth; a valve closing 60 shaft having a gear engaged by said nut gear; a lockable box inclosing the outer end of said screw shaft; a handle in said box; and, means in said box operatively connecting said screw shaft with said handle. 65

10. In a prepayment gas meter, the combination with a valve controlling the passage of gas through the meter; of valve controlling means operatively connected with the meter mechanism and movable thereby to 70 close said valve, and, operatively connected with manually operative means, exterior to the meter, movable to open said valve; said manually operative means including a handle permanently connected with said valve 75 controlling means; and, a lockable box inclosing said handle, having a removable lid provided with means to prevent rotation of said handle when said box is closed; whereby, said valve is directly operable by said 80 handle upon opening said box.

11. In a prepayment gas meter, the combination with a valve controlling the passage of gas through the meter; of manually operative means including a handle operatively 85 connected with said valve; and, a lockable inclosure for said handle containing means arranged to prevent accidental rotation of said handle; whereby, said handle is inaccessible except to one having means to open 90 said inclosure.

12. In a prepayment gas meter, the combination with a valve controlling the passage of gas through the meter; of manually operative means including a handle arranged to 95 open said valve; means normally preventing rotation of said handle; and, a lockable inclosure for said handle; whereby, said valve may be immediately operated by said handle upon opening said box. 100

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this seventeenth day of August, 1912.

WILLIAM L. BROWN.

Witnesses:

JOSEPH E. CARR,
HARRY D. MARSHALL.