E. A. REEVES.

MECHANISM FOR OPERATING GAS METER VALVES.

APPLICATION FILED JAN. 24, 1911.

1,035,905.

Patented Aug. 20, 1912

2 SHEETS—SHEET 1.

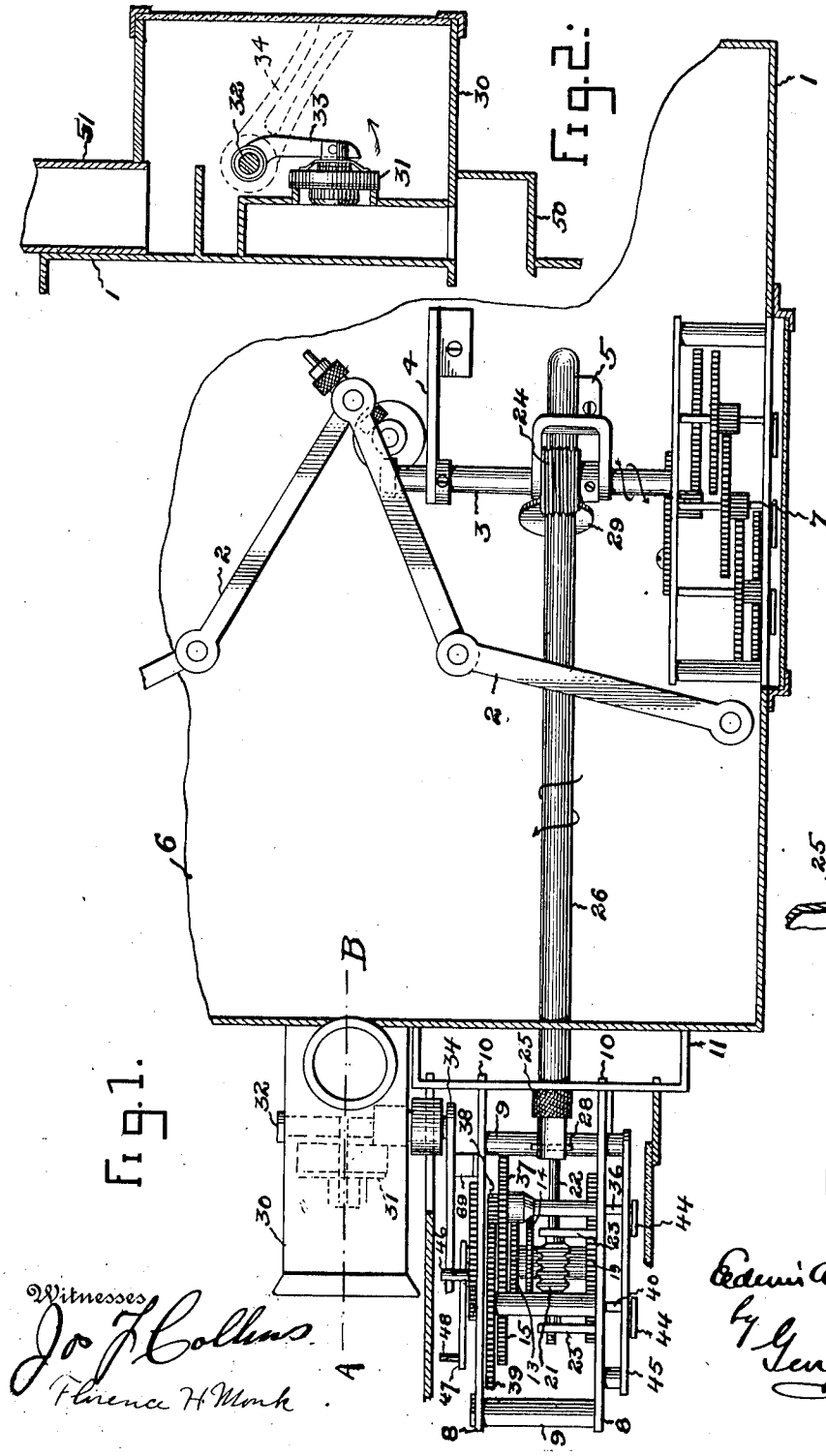

Fig. 1.

Fig. 2.

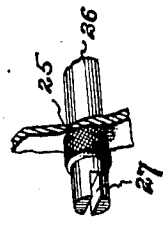

Fig. 3.

Witnesses

Jos. F. Collins.

Florence H. Monk.

Inventor

Edwin A. Reeves

by George P. Hall

Attorney

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2 SHEETS—SHEET 2.

Fig. 6.

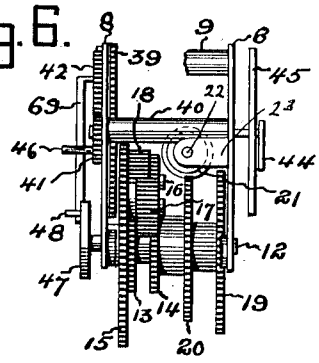


Fig. 7.

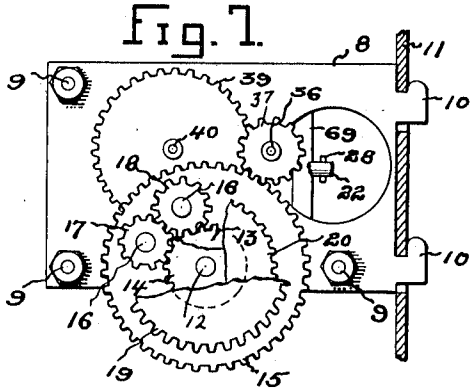


Fig. 4.

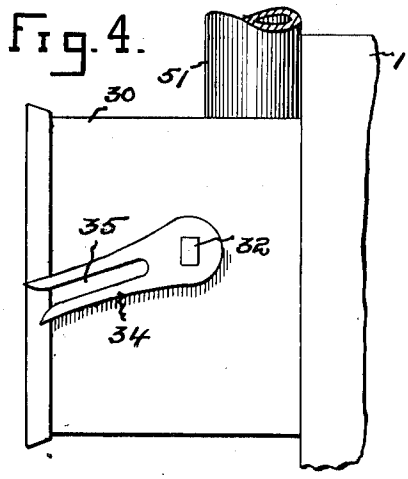


Fig. 5.

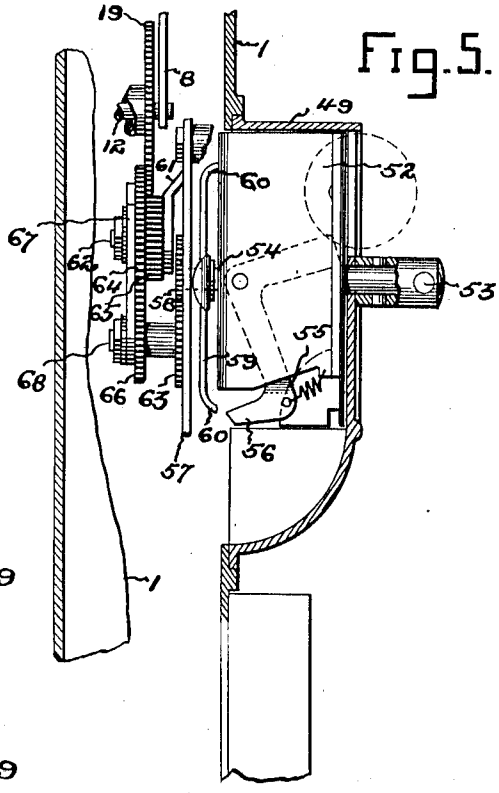
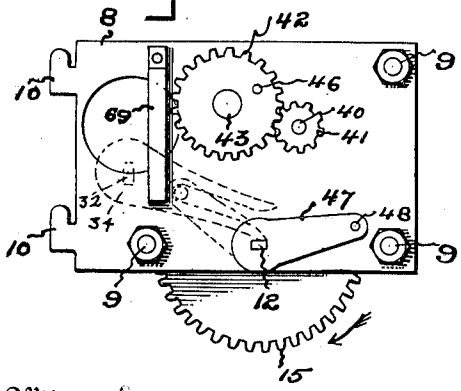


Fig. 8.



Witnesses

J. D. F. Callin

Florence H. Munk.

Inventor

Edwin A. Reeves

by George E. Hood

Attorney

UNITED STATES PATENT OFFICE.

EDWIN A. REEVES, OF MILFORD, CONNECTICUT.

MECHANISM FOR OPERATING GAS-METER VALVES.

1,035,905. Specification of Letters Patent. Patented Aug. 20, 1912.

Application filed January 24, 1911. Serial No. 604,345.

To all whom it may concern:

Be it known that I, EDWIN A. REEVES, a citizen of the United States, residing at Milford, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Mechanism for Operating Gas-Meter Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to new and useful improvements in mechanism for operating gas meter valves, and has for its object, among other things, to operate such mechanism by coin actuated means, although not necessarily limited thereto; means whereby the valve may be kept off its seat until a predetermined quantity of gas has been consumed; and to accomplish these and other desirable objects with mechanism that is simple in design, economical to construct, capable of being readily assembled, and applied to any one of the common forms of gas meters.

To these, and other ends, my invention consists in the mechanism for operating gas meter valves, having certain details of construction and combinations of parts, as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures; Figure 1 is a plan view of the upper portion of a meter with my improved mechanism attached thereto, the shell of said meter being shown in section; Fig. 2 is a section of the valve case upon line A—B of Fig. 1; Fig. 3 is a fragmentary, perspective view of one of the shafts; Fig. 4 is a side elevation of the valve case; Fig. 5 is a transverse sectional view of the coin mechanism; Fig. 6 is an elevation of the valve operating mechanism. Fig. 7 is a view thereof looking from the right of Fig. 6, with one of the side plates removed, and portions of some of the gears broken off; and Fig. 8 is an elevation of the valve operating mechanism looking from the left of Fig. 6.

In the operation of my invention a coin is placed within a rotatably mounted carrier, and operates a lever mounted therein, which engages an arm connected with a train of gears, and from which the valve is opened a predetermined distance. The valve is closed through the rotation of the drive shaft, a predetermined number of revolutions of such shaft automatically returning the valve to its closed position. Provision is made, by a separable connection between the valve and its operating mechanism, for operating the same, whereby the predetermined quantity of gas paid for is limited only by the registering capacity of the meter.

In the drawings the numeral 1 designates the meter body, 2 the levers, which are common to every gas meter, 3 the drive shaft, which is also common to all meters, and is shown as being supported by the standards 4 and 5, which are both fastened to the plate 6, and 7 is the registering mechanism.

The drive shaft 3 is rotated from the levers 2 and operates the registering mechanism 7, which registers the amount of gas consumed by means of the usual indicator dials upon the face of the meter. The valve operating mechanism is mounted between two side plates 8 that are held apart by the posts 9, each plate having catches 10 to provide ready means for attachment to the part 11 of the meter body. Journaled in these plates is the spindle 12, having rotatable thereon the gears 13 and 19, which are secured together, said gear 19 being operated from the coin controlled mechanism. Adjacent thereto and rotatable upon the hub between the gears 13 and 19, is the gear 14, of the same diameter and pitch as the gear 13, and fixed thereto is the gear 20, which meshes into a worm 21 fixed on the shaft 22, that is rotatably mounted in brackets 23 on one of the side plates 8. Upon the opposite side of the gear 13 from that of the gear 14, the gear 15 is fixed upon the spindle 12. Rotatably mounted upon the pintles 16, in the gear 15, is the epicycloidal train composed of the pinions 17 and 18 which mesh into each other, and the pinion 17 having engagement also with the gear 14, and the pinion 18 having engagement with the gear 13.

Journaled in the standard 5 at one end, and the bearing 25 fixed in the part 11 at the other end, is the shaft 26, having a slot 27 in the outer end thereof, into which projects the end of the shaft 22 and the cross pin 28 fixed therein, a breakable connection being thus made between the shafts 22 and 26. Fixed on said shaft 26 is a gear 29, the teeth of which engage the teeth of the worm wheel 24 on the shaft 3, the same being held

against endwise movement between the arms of the neck end of the standard 5.

The valve casing 30 can be made of any desired form, but as herein shown consists of a rectangular box having means connected therewith whereby the inlet pipe 50 from the gas main can be connected thereto at one end and the outlet pipe 51 at the other end. Within the interior of this casing is mounted the valve itself, which comprises a valve disk 31 connected by the arm 33 with a shaft 32 journaled in said valve casing, and carrying an arm 34 fixed thereto provided with a slot 35 in the outer end thereof.

Journaled between the side plates 8 is a spindle 36 carrying the pinion 37, which meshes into and is driven by the gear 15, and a pinion 38 which meshes into and drives a gear 39, which is fixed on the spindle 40, also journaled between the plates 8, and having a pinion 41 thereon, which meshes into and drives a gear 42, mounted upon a fixed stud 43. Each of the spindles 36 and 40 carries an indicating finger 44 that rotates in front of the dial 45 fixed to one of the plates 8. Fixed on the end of the spindle 12 is an arm 47, carrying a laterally projecting pin 48 in the outer end thereof, and a similar pin 46 projects laterally from the gear 42.

The relative positions of the arms 34 and 47, when the valve is closed, are shown by broken lines in Fig. 8. As the spindle 12 is rotated by the coin means, hereafter described, in the direction of the arrow, shown in Fig. 8, it will cause the gear 13 and arm 47 to rotate in the direction of the said arrow, and the pin 48, while moving through the slot 35, rotates the shaft 32, through the arm 34, and lifts the valve disk 31 off its seat, thus opening the valve. When fully opened, the pin 48 passes out of the slot 35 and continues its rotary movement, while the arm 34 remains stationary. The rotary movement of the arm 47 is continued in this direction so long as it is operated by the coin means, and during its second revolution the pin 48 engages the underside of the arm 34 and gives it a slight further rotation, moving it entirely out of the path of the said pin, so that any additional movement of the arm 47 will not affect the arm 34 until the same is again moved into the path of said pin. This valve is automatically closed by mechanism actuated from the passage of gas through the meter. As the drive shaft 3 is rotated, the shaft 26 is also rotated through the worm wheel 24 and worm gear 29, and the gear 20 through the worm 21, and arm 47 through the pinion 17. The arm 47 is thus caused to rotate in the reverse direction to that when being rotated from the gear 19. When the gas paid for has been substantially consumed, the pin 46 in the gear 42 engages the arm 34 and moves the slot 35 into the path of the pin 48, so that said pin will enter said slot, and during its continued movement will actuate the rock arm 34 and close the valve by returning the valve disk 31 to its initial position through the rock shaft 32 and intermediate connections. The location of the pin 46 in the gear 42 is such that substantially the total amount of gas capable of being registered by the indicating mechanism will pass through the meter before said pin 46 engages the rock arm 34, provided all of said gas has been paid for in advance. Otherwise, the relation of the pin 46 to the rock arm 34 is such that the amount of gas paid for will pass through the meter before said pin engages the rock arm 47.

It is apparent that any movement of the rock arm 34 in either direction will open or close the valve 31 according to the direction of its movement, and to open the valve the rock lever is actuated by coin mechanism and closed automatically by mechanism operated by the passage of gas through the meter. Any type of coin operated mechanism can be used to operate this meter, but for purposes of illustration I have shown herein a coin mechanism that is contained within the case 49 separably secured to the meter body 1, and within which is rotatable a coin carrier 52 having a finger pin 53 upon one side and a bearing 54 upon the other side. This carrier is made with a coin opening between the walls thereof, and within which is mounted a trip lever 55, having a projecting trip arm 56. Fixed in the rear of the coin case 49 is a plate 57, within which is rotatably mounted a gear 58 having connected therewith a spreader 59, bent at both ends to form the lips 60, which project into the path of the trip arm 56 when in one of its positions. Fixed to the offset arm 61 on said plate 57, is a stud 62, upon which is rotatably mounted the gear 64 and the pinion 65, which gear and pinion are preferably integral with each other. Motion is communicated from the gear 58 to the gears 64 and pinion 65 through the intermediate gears 63 and 66, which rotate upon a stud 68 fixed in an arm 67. Intermediate gears of any size may be substituted for the gears 63 and 66. Hence the ratio of speed between the gears 58 and 64 may be varied indefinitely. The coin case 49 is so mounted in relation to the valve operating mechanism that the pinion 65 meshes into and drives the gear 19, and thus actuates the spindle 12 in one direction.

In operation, the coin is passed into the coin carrier, and while being forced therein engages the trip lever 55 and moves the trip arm 56 thereon into the path of the lips 60 on the spreader 59. The carrier is now rotated through the finger pin 53, and during the movement of the coin carrier the

spreader is moved therewith, and through its connection with the pinion 65, motion is transmitted to the spindle 12 by the mechanism heretofore described, and the valve 31 moved off its seat.

There are minor changes and alterations that can be made within my invention, and I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but claim all that falls fairly within the spirit and scope of my invention.

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

1. The combination with a gas controlling valve; of a manually rotated carrier; a rock shaft connected therewith; a notched arm fixed to said rock shaft; a rotary arm movable in the path of said notched arm; a rotary member having a part thereon projecting into the path of one of said arms; an operative connection between said carrier and rotary arm; a drive shaft; and means for connecting said drive shaft with said rotary arm, whereby the rotation of said shaft in one direction will impart movement to said rotary arm and notched arm.

2. The combination with a gas controlling valve; of a manually operated carrier; a notched rock arm; a rotary arm having a part thereon movable in the path of said rock arm, one of said arms having connection with said gas valve; a rotary member having a laterally projecting part connected therewith, also in the path of said rock arm; and means for actuating said rotary member so that said projecting part will, at a predetermined time, engage the said notched arm and move the same into the path of the projecting part upon said rotary arm.

3. The combination with a controlling valve for a gas or other meter; of a manually operated carrier; a rock shaft having connection with said valve; a radially projecting member connected with said rock shaft; a rotary member; means for actuating said rotary member so as to engage said radially projecting member and move the same out of its path of rotation; and means as an independent rotary member actuated by the passage of gas through said meter for returning said radially projecting member into the path of said rotary member.

4. The combination with a valve disk 31; of the shaft 32, connected therewith; a notched arm 34 fixed to said shaft; a spindle 12; an epicycloidal train of gears for rotating said spindle in opposite directions; an arm 47 fixed to said spindle and having a laterally projecting part thereon; a gear 42; means for imparting rotation thereto; and a member 46 fixed thereto parallel to the axis of said gear and rotatable into the path of said notched arm.

In testimony whereof I affix my signature in presence of two witnesses.

EDWIN A. REEVES.

Witnesses:
GEORGE E. HALL,
J. P. DEJON.