No. 649,511. Patented May 15, 1900.

S. J. GLASS.

PREPAYMENT VENDING APPLIANCE.

(Application filed July 31, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

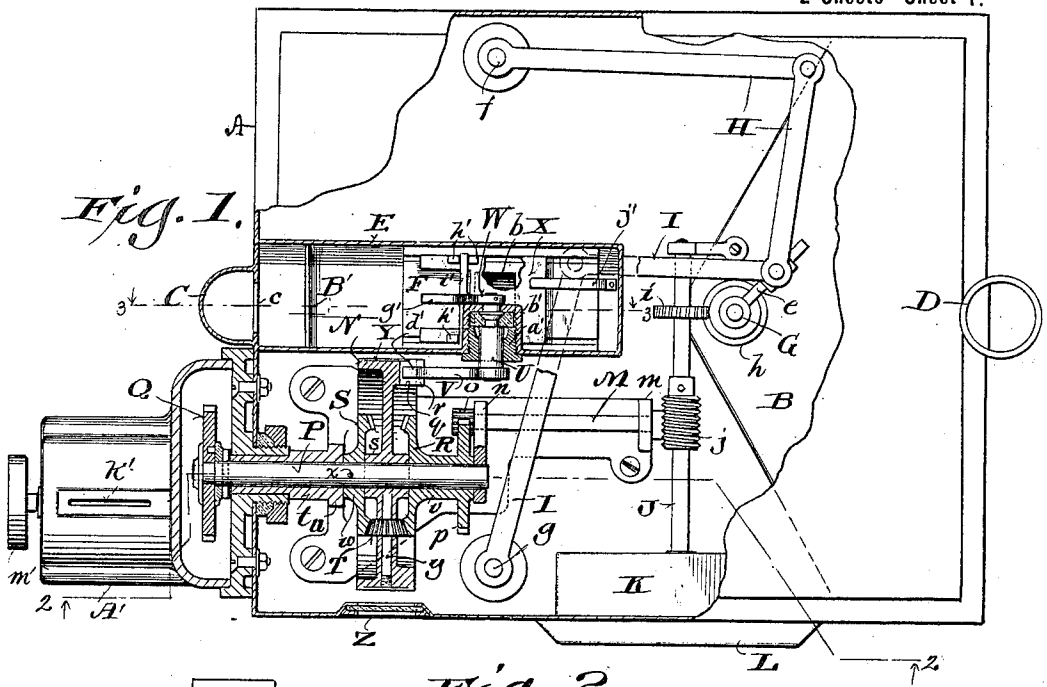
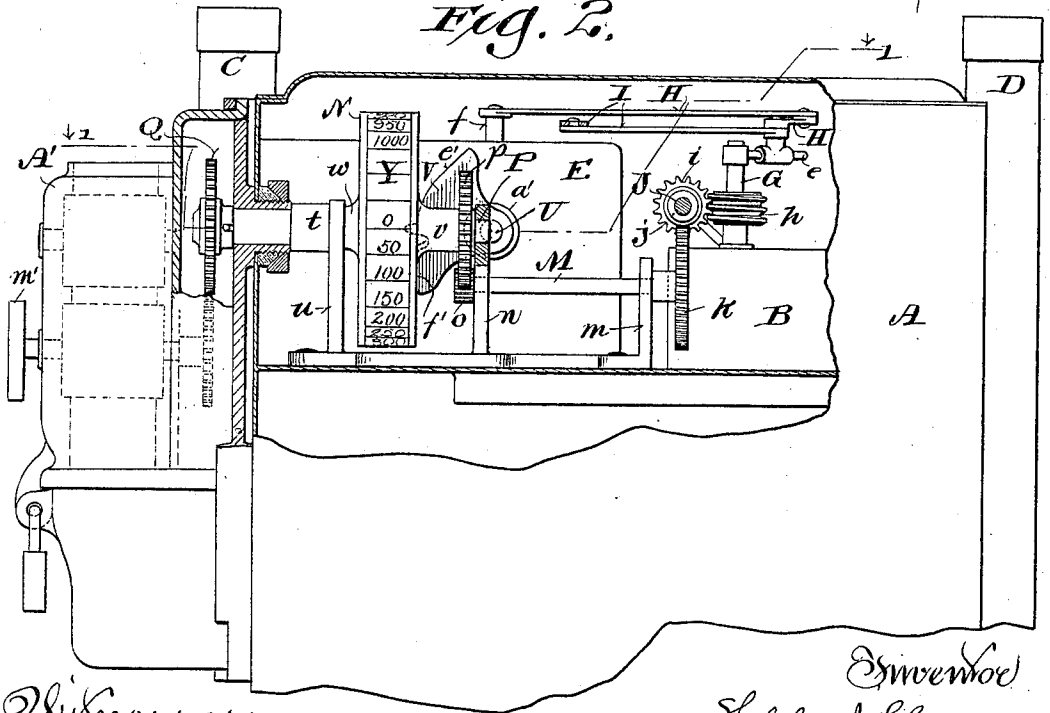


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

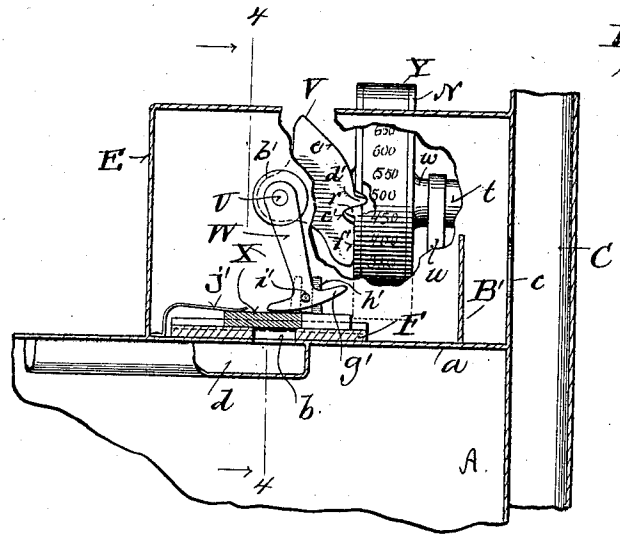
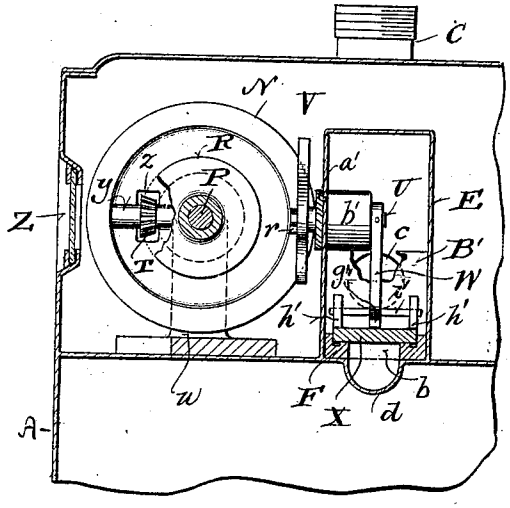


Fig. 4.



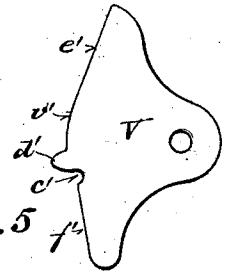


Fig. 5

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UNITED STATES PATENT OFFICE.

SHELDON J. GLASS, OF MILWAUKEE, WISCONSIN.

PREPAYMENT VENDING APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 649,511, dated May 15, 1900.

Application filed July 31, 1899. Serial No. 725,635. (No model.)

To all whom it may concern:

Be it known that I, SHELDON J. GLASS, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Prepayment Vending Appliances; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to that class of prepayment vending appliances which comprise operating mechanism set free by a coin of predetermined size, and has more especial reference to prepayment gas-meters; and it consists in certain peculiarities of construction and combination of parts, as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a plan view of the upper part of a gas-meter embodying my present invention, partly in section, on the line 1 1 of Fig. 2. Fig. 2 is a side elevation of the same, partly in section, on the line 2 2 of Fig. 1. Fig. 3 is a detail sectional view on the line 3 3 of Fig. 1, partly broken away, to better illustrate certain details of construction; and Fig. 4 is a detail sectional view on the line 4 4 of Fig. 3. Fig. 5 is a detail view of one of the rocking arms.

Referring to the drawings, A represents a gas-meter, the interior mechanism of which (not shown in the drawings) is of the ordinary dry-meter or bellows construction.

B represents the ordinary valve-chamber, the interior mechanism of which is likewise not illustrated, the same being well known in the art.

C is the inlet-pipe from the gas-main, and D the outlet-pipe from the meter. In the form of meter herein illustrated the gas from the inlet-pipe is caused to pass into a closed chamber and from thence through a suitably-controlled valve into a channel leading to the valve-chamber B instead of directly from the said inlet-pipe to the channel that leads to said valve-chamber B, as with the ordinary construction of this type of meters, to which end a hole *c* is cut through said inlet-pipe and the wall of the meter-casing communicating with a closed chamber E in the upper part of the meter above the meter-floor or horizontal partition *a*.

F is a valve-seat for a slide-valve hereinafter more particularly described, said valve-seat being secured to said floor or partition *a* within said chamber E, and having an opening or passage-way *b* therethrough communicating with the channel *d*, which extends beneath said floor or partition *a* and communicates with the said valve-chamber B.

G indicates the vertical spindle, which projects up through the top plate of the valve-chamber B, and *e* the crank or arm on the upper end of said spindle, to which crank or arm are united the inner ends of the link-arms H H and I I, whose outer ends are connected to the rocking studs *f g*, all these parts being constructed and operating in the usual manner, and therefore calling for no further description. The spindle G is provided with a worm *h*, which meshes with a worm-wheel *i* on the main arbor or driving-spindle J of the ordinary dial or indicator mechanism, which latter is within the dial-casing K, protected by the usual cover L. The casing and cover of the dial mechanism are shown in the drawings, but the mechanism and dials are not shown, being of the ordinary and well-known type and having nothing to do with my present invention. The described driving-spindle J is further provided with a worm *j*, in mesh with a worm-wheel *k* on one end of a shaft M, supported below the plane of the spindle J in suitable bearings in standards *m n*, the other end of said shaft M carrying a pinion *o*, in mesh with a gear-wheel *p*, connected to the index-wheel mechanism, hereinafter described.

N represents a rotatable wheel, which I term the "index-wheel," one side or face of whose periphery is provided with a notch *q* and a projecting lug or stop *r* in line with one wall of said notch.

P represents a shaft extending entirely through the hub *s* of the index-wheel, which is loose thereon, said shaft having bearings at one end in the described standard *n* and at its other end in a sleeve *t*, which sleeve is supported at its inner end by a standard *u* and at its outer end projects through a proper stuffing-box in the meter-casing, the said shaft P projecting through said sleeve and carrying a removable gear-wheel Q, fast on its outer end.

R is a bevel gear-wheel whose hub *v* is loose

on said shaft P and bears against the hub *s* of the index-wheel N, the said hub *v* being integral or rigid with the hub of the hereinbefore-named gear-wheel *p*, and S is another bevel gear-wheel, whose hub *w* is mounted on said shaft P and made fast thereto, as by pin *x*, the said hub *w* bearing against the hub *s* of the index-wheel N and the beveled teeth of the wheels R S opposing each other and being in mesh with the teeth of a bevel-pinion T, which latter is loosely mounted on a journal or pin *y*, extending through the periphery of the index-wheel into the hub *s* thereof, said pinion T moving in a slot or opening *z* in the web of said index-wheel.

U represents a rock-shaft journaled in a stuffing-box *a' b'*, which projects through one wall of the closed chamber E, and to the outer end of said shaft there is rigidly secured a rocking arm V, (the outline of which is shown in Fig. 5,) the free edge of which is formed with a notch *c'* and projecting lug *d'* for engagement at the proper times with the described lug *r* and notch *q* on the index-wheel N. Above the lug *d'* the said edge of this arm is rounded slightly, as shown at *v'*, and then formed straight, as shown at *e'*, while below said notch *c'* the said edge is formed straight, as shown at *f'*. To the inner end of said shaft U there is rigidly attached another rocking arm W, whose head *g'* has a rounded under surface, so as to always bear upon the upper surface of the slide-valve X as the latter is reciprocated in the valve-seat F in the closed chamber E to open or close the gas-passage *b*. The said valve-seat is shown provided with guideways or flanges between which the valve X moves, and from the upper surface of said valve there project lugs or ears *h' h'*, arranged in pairs to receive the ends of a transverse pin *i'*, which extends through the head *g'* of the arm W. A spring *j'* may be secured within the chamber E to bear down upon the said valve X to aid in securing a close pressure of said valve against its seat. The periphery of the index-wheel N is provided with an index-scale Y, properly numbered, and the meter-casing is provided with a glass-covered opening Z, through which the numbers on said scale may be observed.

A coin-box A', of any approved pattern and containing coin-controlled mechanism of any suitable type, is attached to the meter. I have not deemed it necessary to illustrate the details of any especial coin-box or its interior mechanism, as any box constructed so that a coin of the predetermined size and value when dropped in the coin-slot *k'* of said box will permit the hand-wheel *m'* to operate the mechanism and revolve the described gear-wheel Q, which projects from the shaft P within said coin-box, will answer the purpose, and my present invention is wholly independent of any particular construction of coin-box or coin-controlled mechanism, and, as stated, will operate in conjunction with any rotatable coin-box.

The operation of my device will be readily understood from the foregoing description of its construction, taken in connection with the accompanying drawings, it being understood that the parts are in the relative positions shown in Figs. 1 and 2, with the gas-passage *b* in the chamber E closed by the slide-valve X. A coin of the predetermined size is dropped in the coin-slot *k'* of the coin-box A' and serves as a clutch to unite the operative parts of the internal mechanism (not shown) of said coin-box in the usual well-known manner, so that when the hand-wheel *m'* of said coin-box is turned, with the coin inside the box, the gear-wheel Q will be thereby partly revolved, thus turning the shaft P, to which said gear-wheel Q is made fast, and the bevel gear-wheel S, also fast on said shaft P, in the same direction, and as said bevel gear-wheel S is in mesh with the bevel-pinion T on the journal or pin *y* in the index-wheel N this same movement of the shaft P and its connected parts will move said index-wheel N in the same direction, and as the lug *d'* of the rocking arm V is in engagement with the notch *q* in the adjacent face of the index-wheel N when the valve X is in the closed position this movement of the index-wheel N will rock the arm V (and its shaft U and other rocking arm W, all rigidly connected together) and bring the straight edge *e'* of the arm V against the face of wheel N, and as the arm W is thus rocked the transverse pin *i'*, carried by the head *g'* of said rocking arm W and which is in engagement with the ears *h' h'* of the slide-valve X, will move said slide-valve backward and open the described gas-passage *b* in the closed chamber E, thereby permitting the flow of gas from the inlet-pipe C, hole *c*, closed chamber E, gas-passage *b*, and channel *d* to the valve-chamber B, and thence through the ordinary working portions of the meter to the outlet-pipe D. It will be understood that the just-described movement of the index-wheel N has been to the extent controlled by the predetermined size of the coin used and the proper proportioning of the gear-wheels for that size of coin, and it will be readily seen that any additional coins of same kind put into the coin-box and operated as before will serve to rotate the index-wheel N still farther from its initial or starting point (shown in Figs. 1 and 2 of the drawings) in the same direction without further opening the valve in the chamber E, as the said index-wheel N will be simply further rotated with each additional coin used until the described lug or stop *r* on said wheel N comes into contact with the adjacent part of the rocking arm V, which is the limit of one entire revolution of the index-wheel, and the index-scale on said wheel is properly marked for the number of cubic feet of gas to be consumed during one revolution of said wheel. The dial-spindle J is rotated in the

ordinary manner by gas passing through the meter, thus actuating the worm *j*, worm-wheel *k*, shaft M, pinion *o*, and gear-wheel *p*, to which last-named gear-wheel the bevel gear-wheel R is rigidly connected, and the consequent rotation of said bevel gear-wheel, which is in mesh with the described bevel-pinion T when said gear-wheel R is rotated by the rotation of said dial-spindle J, as just described, will cause the index-wheel N to be rotated in the opposite direction to that first described, so as to bring said index-wheel gradually, by the consumption of the gas paid for, back to its initial or starting point, when the lug or stop *r* on said wheel N will engage with the lug *d'* on the rocking arm V, thus guiding said lug *r* into the notch *c'* on the arm V and rocking the latter, (meanwhile bringing the lower straight edge *f'* of said arm V against the adjacent face of the wheel N,) and as the said arm V is thus rocked this rocks its shaft U and the other rocking arm W, rigid therewith inside the closed chamber B, in the opposite direction to that formerly described, thereby moving the slide-valve X over the gas-passage *b* and shutting off the further supply of gas therethrough until an additional coin or coins shall have been inserted in the coin-box A' and the valve X moved to reopen said passage *b* in the manner heretofore described.

It will be understood that all of the gear-wheels, worm-wheels, pinions, and other gearing of my device are of such size, number of teeth, &c., as is proportioned to the amount of gas to be paid for by the predetermined size and value of the actuating coin or coins, as is common in all devices of this nature, and hence that the dial-driving spindle J will rotate the corresponding number of times before the index-wheel N will be carried back to the initial or starting point and the supply of gas cut off, and that the described lower straight edge *f'* of the rocking arm V, when brought into contact, as set forth, with the adjacent face of the said index-wheel N, forms a positive stop against the accidental further movement of said wheel in the same direction when the supply-valve has been closed thereby, as might otherwise happen in the event of a leakage of the valve in chamber E, while the upper straight edge *e'* prevents the rocking arm V from moving out of proper position to engage the lug *r* on the index-wheel N when the latter is rotated to open the said valve. It will also be understood that as the gear-wheel Q is of such proportion that a coin of the predetermined size will enable the index-wheel N to be rotated such a distance in one direction, as heretofore described, as would exactly equal the rotation of said index-wheel N in the opposite direction by the passage of the quantity of gas through the meter for which said coin paid it is desirable that said gear-wheel Q may be capable of removal from the end of the shaft P, so that said gear-wheel Q may be replaced by one of different size and number of teeth for different-priced gas, which other gear-wheel may be secured to the end of said shaft P, when necessary, without any other change in the construction of the meter mechanism.

It is to be noted that at all times when my device is in use the quantity of unconsumed gas to the credit of the consumer will be indicated by the number on the index-scale Y on the index-wheel N, which is visible opposite the center of the described glass-covered opening Z in the meter-casing.

In order to prevent tampering with the valve X, I preferably form a partition B' across the closed chamber E, said partition rising to a height just above the plane of the top of the hole *c*, and thereby I guard against the insertion of a wire or other device through the inlet-pipe C and hole *c* into the gas-passage *b*, which would keep the valve from wholly closing said passage.

While I have illustrated and described my invention with especial reference to prepayment gas-meters, I do not limit myself thereto in so far as said invention or any part thereof is applicable to other prepayment devices.

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

1. In a prepayment vending appliance, the combination with a device regulating the supply of the product to be vended and mechanism for controlling the movement of said regulating device, of a rotatable wheel whose periphery is everywhere equidistant from its shaft; a start-and-stop device on said wheel; a device connected to the mechanism for controlling the movement of the supply-regulating device, and provided with means for engagement with the start-and-stop device on said wheel; coin-controlled mechanism adapted to rotate the said wheel in one direction, and thereby release the supply, and mechanism controlled by the delivery of the product to rotate the said wheel in the opposite direction and cut off the supply.

2. In a prepayment vending appliance, the combination with a device regulating the supply of the product to be measured and mechanism for controlling the movement of said regulating device, of a rotatable wheel whose periphery is everywhere equidistant from its shaft having an index-scale thereon corresponding in numbering to the predetermined quantity of the product to be measured during one revolution of the wheel; a start-and-stop device on said wheel; a rock-shaft connected to the mechanism for controlling the movement of the supply-regulating device, and having means for engagement with the start-and-stop device on said wheel; coin-controlled mechanism adapted to rotate the said wheel in one direction, and thereby release the supply, and mechanism controlled by the delivery of the product to rotate the said wheel in the opposite direction and cut off the supply.

3. In a prepayment vending appliance, the combination with a device regulating the supply of the product to be vended, and mechanism for controlling the movement of said regulating device, of a wheel-shaft, and a rotatable wheel, loose on said shaft, and provided with a start-and-stop device; a bevel gear-wheel fast on said shaft; a journal extending radially between the periphery and hub of said rotatable wheel; a bevel-pinion loosely mounted on said journal, and in mesh with said bevel gear-wheel; a device connected to the mechanism for controlling the movement of the supply-regulating device, and provided with means for engagement with the start-and-stop device on said wheel; coin-controlled mechanism adapted to rotate said wheel in one direction, and thereby release the supply, and mechanism controlled by the delivery of the product to rotate said wheel in the opposite direction and cut off the supply.

4. In a prepayment vending appliance, the combination with a device regulating the supply of the product to be vended, and mechanism for controlling the movement of the said regulating device, of a wheel-shaft and a rotatable wheel, loose on said shaft, and provided with a start-and-stop device; a pair of opposed bevel gear-wheels, one of which is fast, and the other loose, on said shaft; a journal extending radially between the periphery and hub of said rotatable wheel; a bevel-pinion loosely mounted on said journal, and in mesh with said bevel gear-wheels; a device connected to the mechanism for controlling the movement of the supply-regulating device, and provided with means for engagement with the start-and-stop device on said wheel; coin-controlled mechanism adapted to rotate said wheel in one direction and thereby release the supply, and mechanism controlled by the delivery of the product to rotate said wheel in the opposite direction and cut off the supply.

5. In a prepayment vending appliance, the combination with a rotatable wheel, provided with a projecting lug and adjacent notch, of a shaft passing loosely through the hub of said wheel; a pair of bevel gear-wheels on said shaft, one arranged on each side of said hub, and one of said gear-wheels fast and the other loose on said shaft; a pin or journal located between the hub and periphery of said rotatable wheel; a bevel-pinion loose on said pin or journal and in mesh with the opposing faces of said bevel gear-wheels; a coin-controlled actuating-wheel fast on the outer end of said shaft; a gear-wheel loose on the other end of said shaft, but rigid with the loosely-mounted bevel gear-wheel; a shaft having a pinion fast on one end in mesh with the gear-wheel loose on the end of the first-named shaft, and a worm-wheel at the other end thereof; a revoluble spindle carrying a worm in engagement with said worm-wheel; and a rock-shaft carrying a rocking arm at one end having a notch and lug for engagement with the like parts on the rotatable wheel, and connected at its other end to the mechanism for opening and closing the supply-valve of the device.

6. In a prepayment gas-meter, the combination with a closed chamber arranged above the meter-floor, of a gas-inlet pipe having an opening communicating with said chamber, a valve-controlled gas-passage leading from said chamber and communicating with the valve-chamber of the meter, and a partition extending across said closed chamber between the said valve-controlled gas-passage and said opening in the gas-inlet pipe, and partially closing said closed chamber to form an obstruction to the passage of solid bodies without interfering with the flow of gas therethrough.

7. In a prepayment gas-meter, the combination with a closed chamber arranged above the meter-floor, of a gas-inlet pipe in communication with said chamber, a valve-controlled gas-passage leading from said chamber to the valve-chamber of the meter; a rock-shaft within said closed chamber, and projecting therethrough; an arm secured at one end to said rock-shaft within said chamber and carrying a valve at its other end adapted to close or open said gas-passage; a rocking arm on the exterior projecting end of said rock-shaft, provided with a projecting lug and adjacent notch; a rotatable wheel exterior to said closed chamber and provided with a lug and notch for engagement with those on said rocking arm; coin-controlled mechanism adapted to rotate the said wheel in one direction and thereby open the valve in said closed chamber, and mechanism controlled by the passage of gas through the meter to rotate said wheel in the opposite direction and close said last-named valve.

8. In a prepayment gas-meter, the combination with a valve controlling the supply of gas into the regular valve-chamber, and mechanism for controlling the movement of said supply-valve, of a rotatable wheel whose periphery is everywhere equidistant from its shaft, and laterally provided with a start-and-stop device; a device connected with the mechanism for controlling the movement of the supply-valve, and provided with means for engagement with the start-and-stop device on said wheel; coin-controlled mechanism adapted to rotate said wheel in one direction and thereby open the supply-valve, and mechanism controlled by the passage of gas through the meter to rotate the said wheel in the opposite direction, and close said supply-valve.

9. In a prepayment gas-meter, the combination with a valve controlling the supply of the gas into the regular valve-chamber, and mechanism for controlling the movement of said supply-valve, of a rotatable wheel within the meter-casing provided with a projecting lug and adjacent notch in one side thereof, and having an index-scale on its periphery numbered to correspond with the cubic feet of gas

adapted to pass through the meter during one revolution of said wheel, an opening in said casing to expose said numbering, a device connected to the mechanism for controlling the movement of said supply-valve, and provided with a lug and notch adapted for engagement with those on said wheel; coin-controlled mechanism adapted to rotate said wheel in one direction and thereby open the supply-valve, and mechanism controlled by the passage of gas through the meter to rotate the said wheel in the opposite direction, and close said supply-valve.

10. In a prepayment gas-meter, the combination with a valve controlling the supply of gas into the regular valve-chamber, and mechanism for controlling the movement of said supply-valve, of a rotatable wheel provided with a projecting lug and adjacent notch in one side thereof; and a rock-shaft connected at one end to the mechanism for controlling the movement of said supply-valve, and having a rocking arm rigidly secured to its other end, said rocking arm being provided with a lug and notch adapted for engagement with those on said wheel, and having straight edges above and below said lug and notch, for successive engagement with the adjacent side of said wheel, the upper straight edge serving to keep the said rocking arm in proper position for engagement with the lug on said wheel, when the latter is rotated in one direction, to open the supply-valve, and the lower straight edge forming a positive stop against further movement of said wheel after the latter has been rotated in the opposite direction until the supply-valve is closed thereby.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

SHELDON J. GLASS.

Witnesses:
H. G. UNDERWOOD,
N. E. OLIPHANT.