No. 663,338. Patented Dec. 4, 1900.

S. J. GLASS.

PREPAYMENT VENDING APPLIANCE.

(Application filed Aug. 7, 1897.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

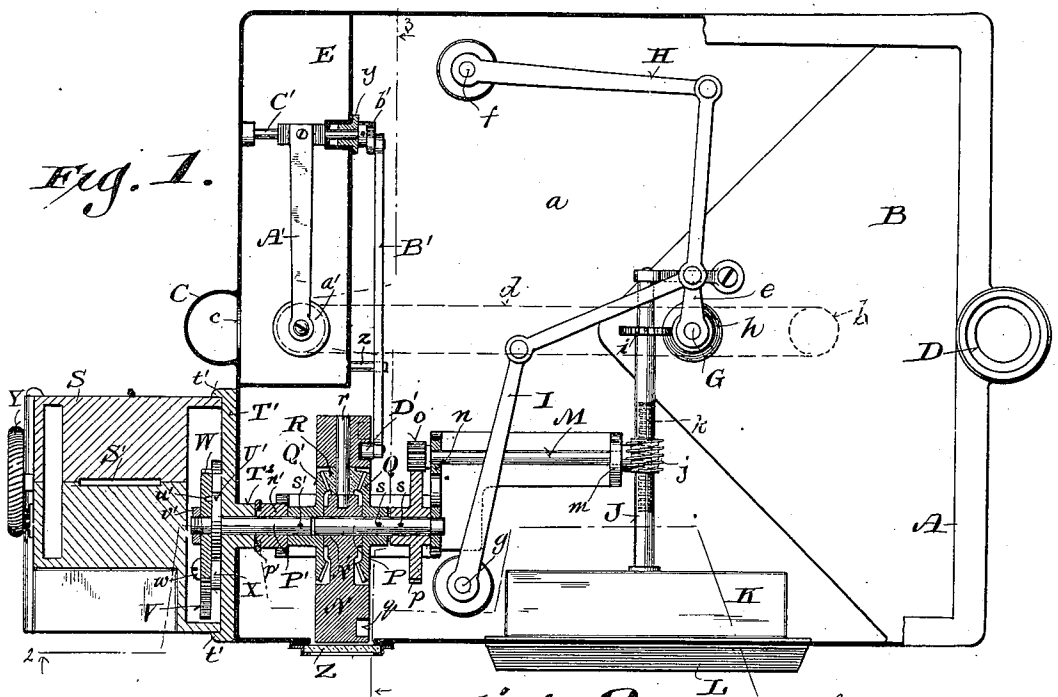
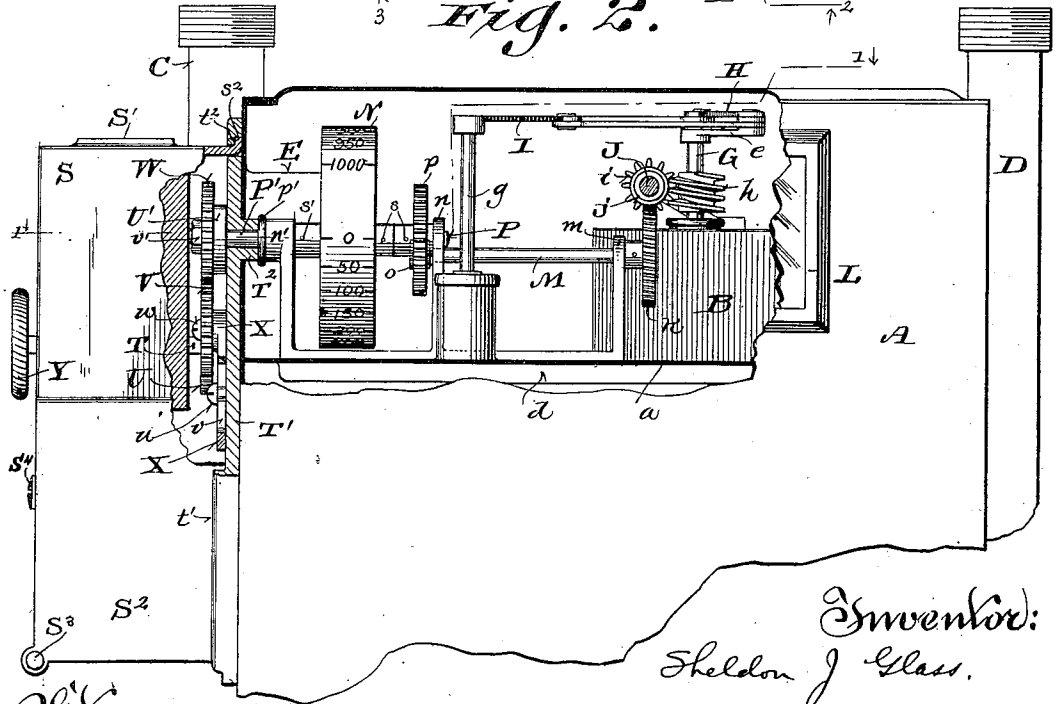


Fig. 2.



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Fig. 3.

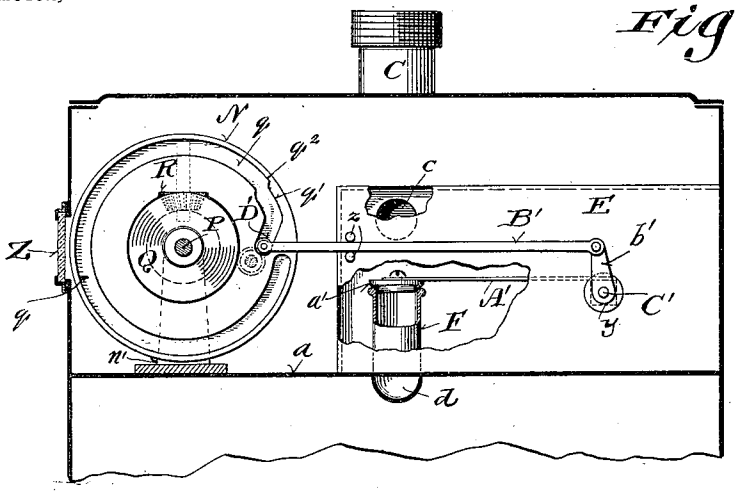


Fig. 4.

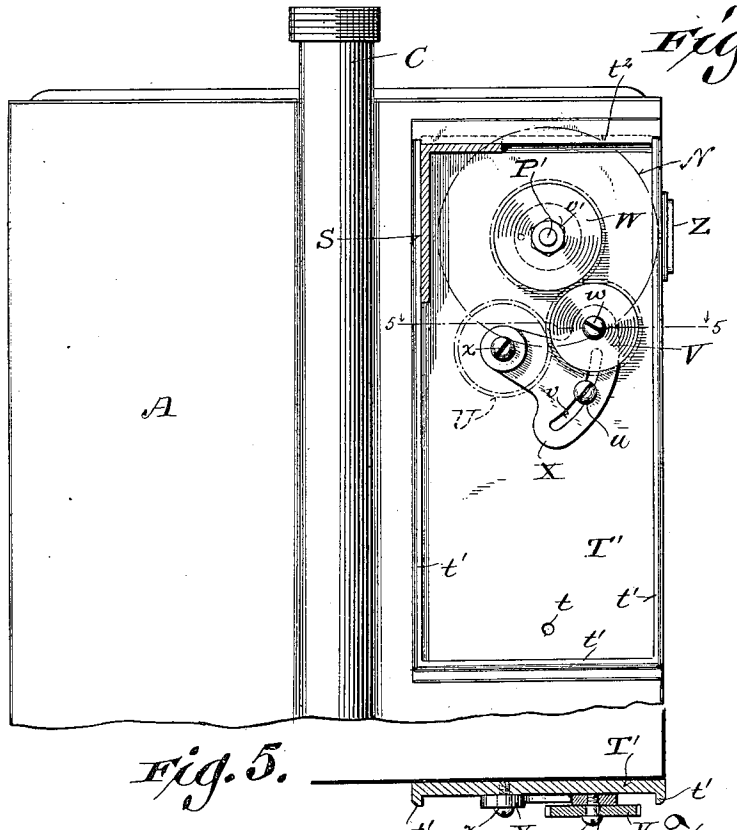


Fig. 5.

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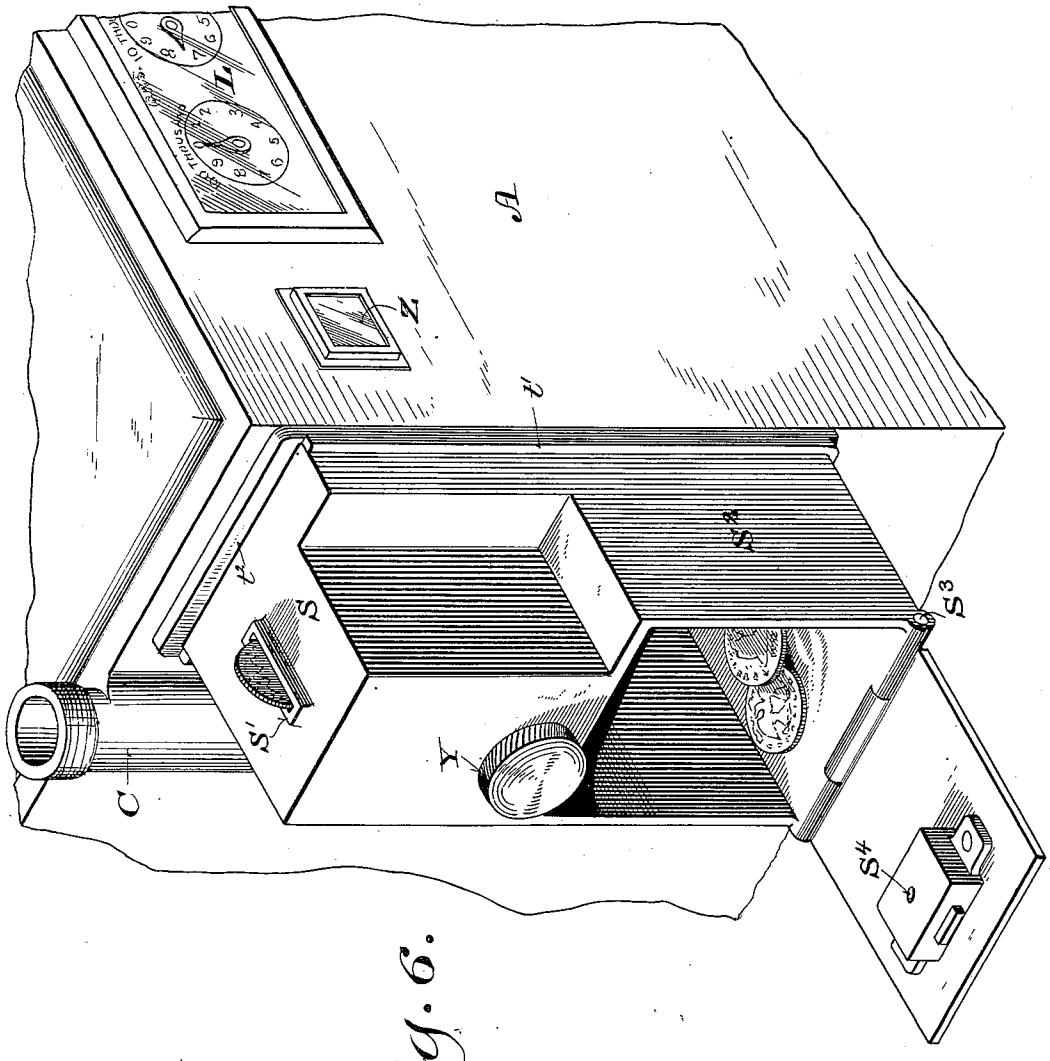


Fig. 6.

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UNITED STATES PATENT OFFICE.

SHELDON J. GLASS, OF MILWAUKEE, WISCONSIN.

PREPAYMENT VENDING APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 663,338, dated December 4, 1900.

Application filed August 7, 1897. Serial No. 647,483. (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 horizontal sectional view of the upper part of a gas-meter embodying my present invention, taken on the line indicated by 1 1 in Fig. 2. Fig. 2 is a side elevation of the same, partly in section, on the line indicated by 2 2 in Fig. 1. Fig. 3 is a transverse sectional view on the line indicated by 3 3 in Fig. 1. Fig. 4 is an outer end view with the coin-box removed. Fig. 5 is a detail sectional view on the line indicated by 5 5 in Fig. 4. Fig. 6 is a perspective view illustrating the upper part of a gas-meter with a coin-box secured thereto.

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 the channel leading to the valve-chamber B, instead of directly from the said inlet-pipe to the channel leading to said valve-chamber B, as meters are ordinarily constructed, and to this end a hole *c* is cut through said inlet-pipe and the wall of the meter-casing communicating with a closed chamber E in one corner of the upper part of the meter above the meter-floor or horizontal partition *a*. F is a vertical pipe located within this chamber E and passing down through the floor thereof—*i. e.*, the described partition *a*—and communicating with a channel *d*, which extends beneath the said floor or partition *a* and communicates through an opening *b* (shown in dotted lines in Fig. 1) with the valve-chamber B.

G is the vertical spindle, which projects up through the top plate of the valve-chamber B, and *e* the crank or arm on the top of said spindle, to which crank or arm are united the inner ends of the link-arms H I, whose outer ends are connected to the rocking studs *f g*, all these parts being constructed and operating in the usual manner, and hence 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 transparent 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 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 in suitable bearings *m n*, the other end of said shaft M carrying a pinion *o*, in mesh with the gear-wheel *p*, connected to the cam-wheel mechanism hereinafter described.

N represents the cam-wheel, in one face of which is formed a cam-groove *q q'*.

P P' represent a pair of spindles, the spindle P being made fast to the hub of the gear-wheel *p* and also to the hub of a bevel gear-wheel Q, as by pins *s s*, while the spindle P' is made fast to the hub of a bevel gear-wheel Q', as by pin *s'*. The outer end of spindle P is supported in the bearing *n* adjacent to shaft M, and said spindle P passes entirely through the hub N' of the cam-wheel N, which is loose thereon, and a pin *r* extends through the periphery of the cam-wheel into the hub thereof and serves as the journal of a bevel-pinion R, loose on said pin or journal *r* and in mesh with the bevel gear-wheels Q Q', as shown in Fig. 1. The spindle P' is supported in a bearing *n'*, as shown in Figs. 1 and 2.

S represents a coin-box of any preferred construction—such, for example, as is shown in my United States Letters Patent No. 601,251, dated March 29, 1898—which will enable the shaft T thereof (shown in Fig. 2) to operate when a coin of the predetermined size has been dropped into the slot S′ of said box, and U is a gear-wheel fast on said shaft T. A plate T′ is secured to the outside of the meter-casing in any suitable manner, and said plate has a boss T^2 on its rear side, which projects through an opening in said meter-casing. The front side of this plate is provided with forward-projecting side and bottom flanges t' t' t' and with a shouldered slot t^2 near its top and a screw-hole t near its bottom for the support and attachment of the coin-box S. The top of said box has a rearward and upward extending flange s^2, which fits in through the slot t^2, as shown in Fig. 2, the box then dropping down against the plate and fitting snugly within the flanges t' t' t' and being secured by a screw passed through the back plate of the coin-box S into the screw-hole t in said plate T′, the door of the coin-receptacle S^2, which forms the lower part of the coin-box, being opened to enable this to be done. In Fig. 2 one outer side of the coin-receptacle S^2 is shown, together with the hinge S^3 and lock S^4 of its said door; but as my present invention is wholly independent of any particular construction of the coin-box or coin-controlled mechanism therein I have not further illustrated the details of the coin-box shown.

W is a gear-wheel removably secured to the outer end of the spindle P′, which projects through the plate T′ and its boss T^2, there being a yielding washer p' interposed between the adjacent ends of the bearing n' and boss T^2 around said spindle P′.

U′ is a disk made fast to the spindle P′ beyond the plate T′, and this disk has one or more outwardly-projecting fingers u' to enter a corresponding hole or holes in the said wheel W, so that when said wheel is in place on the spindle P′ and secured by the nut v' on the screw-threaded outer end of said spindle the said wheel W will be held fast and prevented from slipping. This wheel W is of a size and number of teeth proportioned to the amount of gas to be consumed for the value of the coin used, as hereinafter described.

X is a movable segment-arm secured to the plate T′ by a screw x, and said arm is formed with an arc-shaped slot v, beyond which it carries a gear-wheel V, said wheel revolving loosely on the cylindrical part w' of a screw w, which latter screw enters the arm X, as best shown in Fig. 5. By this arrangement the wheel W can be removed and a wheel of different diameter and number of teeth can be substituted therefor, and the arm X can be correspondingly moved, so that the wheel V will still be in mesh with the new wheel W, and then by tightening a screw u, whose shank passes through the slot v in the arm X, the said arm can be rigidly set in the new adjustment. The described wheel U on the end of the shaft T of the coin-box is always in mesh with the wheel V, (which latter I term the "intermediate" wheel,) and the latter is always in mesh with wheel W.

A′ is an arm within the hereinbefore-described chamber E, one end of this arm carrying a valve a', adapted to seat itself on the mouth of the described vertical pipe F, and the other end of said arm being made fast to a rock-shaft C′, within said chamber E. This rock-shaft C′ passes out of said chamber through a stuffing-box y into the meter, and this projecting end of the rock-shaft is fitted with a crank b', to which crank is secured one end of a connecting-rod B′, whose other end is fitted with a roller D′, movable within the cam-groove in the cam-wheel N, said connecting-rod passing between two guide-pins z z, as shown.

The operation of my device is as follows, the parts being understood as being in the relative positions shown in the drawings, with the valve a' in the chamber E closed: A coin of the proper size is dropped into the slot S′ of the coin-box S and serves as a clutch to unite the internal mechanism (not shown) of said box in any desired manner, so that when the hand-wheel Y of said coin-box is turned with the coin inside the box the shaft T of said coin-box and the gear-wheel U on said shaft will be partly revolved, and the rotation of this wheel U (through its engagement with the intermediate wheel V) will cause the gear-wheel W on the spindle P′ to move in the same direction to an extent controlled by the predetermined size of the coin used and the proper proportioning of the gear-wheels for that size of coin. The bevel gear-wheel Q′ being connected with the gear-wheel W by means of the spindle P′ and pin s will thus be rotated in the same direction and to the same extent as the gear-wheel W, carrying the bevel-pinion R and the cam-wheel N with it, to an extent equal to one-half the amount of rotation of said bevel gear-wheel P′. This movement is caused by the pinion R traveling upon the face of the bevel gear-wheel Q, using the pin r as a fulcrum. This revolution of the cam-wheel N causes the roller D′ on the connecting-rod B′ to pass from the end of the cam-groove q (shown in Fig. 3) to the point marked q^2, thereby throwing the crank end of the connecting-rod B′ back or away from the cam-wheel N. This movement of the crank b' rocks the shaft C′, raising the arm A′ and lifting the valve a' from its seat, thereby permitting the flow of gas from the chamber E, through the vertical pipe F and its extension or 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 readily seen that any additional

coins put into the coin-box and operated as before will serve to rotate the cam-wheel N still farther from its initial or starting point shown in the drawings without further opening the valve in the chamber E, as the roller D′ will follow the circular path of the cam-groove q after passing the point marked q^2.

The dial-spindle J is rotated in the ordinary manner by gas passing through the meter, thus actuating the worm j, worm-wheel k, spindle M, pinion o, and gear-wheel p, to which last-named gear-wheel p the bevel gear-wheel Q is connected by means of the spindle P and pins s s, the said gear-wheel Q rotating in the opposite direction from the direction of rotation of the bevel gear-wheel Q′, heretofore described. The revolution of the bevel gear-wheel Q in this manner causes the bevel-pinion R to travel around the face of the bevel gear-wheel Q′, carrying the cam-wheel N with it, in such a manner as to bring the end of the cam-groove back to the initial point, and thus causing the roller D′ and adjacent end of the connecting-rod B′ to be pulled by the cam-groove toward the center of the cam-wheel N and to the initial end of said cam-groove. This action serves to close the valve a' on its seat on the pipe F and cuts off further supply of gas through said pipe until an additional coin or coins shall have been inserted in the coin-box S and the valve a' reopened in the manner heretofore described.

It will be understood that if several coins of the predetermined size are successively fed into the slot of the coin-box the cam-wheel N will be rotated a correspondingly-increased distance from its initial or starting point for each coin (up to the limit of one entire revolution of said cam-wheel) and that the dial driving-spindle J will rotate a corresponding number of times before the cam-wheel N will be carried back to the initial point and the supply of gas be cut off. At q' in the cam-groove there is shown an inward depression or break in the regular lines of the cam-groove. This irregularity in the cam-groove causes the supply of gas through the pipe F to be partially checked by the temporary depression of the valve a' toward its seat to such an extent as may be necessary to give warning that the supply of gas paid for is nearly exhausted. This warning may be given at any predetermined time before the supply is exhausted by placing the depression or break in the cam-groove at the proper point for such warning.

As herein illustrated, the cam-wheel N would make one complete revolution for each twelve hundred feet of gas passing through the meter, and on the periphery of this wheel is placed an index-scale numbering from "0" to "1000," and a glass-covered opening Z is formed in the meter-casing, through which the index-scale on said cam-wheel can always be seen, and hence whatever number is seen opposite the center of this opening at any time will indicate the quantity of unconsumed cubic feet of gas still to the credit of the consumer.

The gear-wheels U and W are of such proportion that a coin of the predetermined size will enable the cam-wheel N to be rotated such a distance in one direction, as heretofore described, as would exactly equal the rotation of said cam-wheel N in the opposite direction by the passage of the quantity of gas for which said coin paid through the meter and the consequent described action of the meter mechanism, and by the described method of attachment of the gear-wheel W and means of adjustment of the arm X, carrying the intermediate gear-wheel V, the ready removal of the wheel W and its replacement by one of different size and number of teeth is provided for, so that the proper wheel for different-priced gas may be secured to the spindle P′ whenever necessary and the arm X and intermediate gear-wheel V easily adjusted to bring the said train of gear-wheels U V W again in mesh, as described.

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 cam-wheel having a cam-groove on one side thereof, a pair of spindles arranged end to end, one of which spindles passes loosely through the hub of said cam-wheel, a pair of bevel gear-wheels, one arranged on each side of said hub, and each wheel fast on one of said spindles, a pin or journal extending through the periphery of said cam-wheel into the hub thereof, a bevel-pinion loose on said pin and in mesh with the opposing faces of the said bevel gear-wheels, a coin-controlled actuating-wheel fast on the outer end of one of said spindles, a gear-wheel fast on the outer end of the other of said spindles, a shaft having a pinion at one end in mesh with the last-named gear-wheel, and a worm-wheel at the other end thereof, a revolving spindle carrying a worm in engagement with said worm-wheel, and a connecting-rod carrying a roller at one end adapted to travel within the cam-groove of the cam-wheel, and connected at its other end to the mechanism for opening and closing the supply-valve of the device, substantially as set forth.

2. In a prepayment gas-meter, the combination with a closed chamber arranged above the meter-floor, a gas-inlet pipe in communication with said chamber, a vertical pipe within the said chamber in communication with 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 the mouth of said vertical pipe, a cam-wheel having a cam-groove in one

side thereof, a connecting-rod having a roller at one end adapted to travel within said cam-groove and a crank on the other end connected to the projecting end of the said rock-shaft, coin-controlled mechanism adapted to rotate the cam-wheel in one direction and thereby open the valve within the closed chamber, and mechanism controlled by the passage of gas through the meter to rotate the cam-wheel in the opposite direction and close said last-named valve, substantially as set forth.

3. In a prepayment gas-meter, the combination with a valve controlling the supply of the gas into the regular valve-chamber, and mechnism for controlling the movement of said supply-valve, of a cam-wheel having a cam-groove in one side thereof, a connecting-rod having a roller at one end adapted to travel in said cam-groove and connected at its other end to the mechanism for opening and closing the supply-valve, coin-controlled mechanism adapted to rotate the cam-wheel in one direction and thereby open the supply-valve and mechanism controlled by the passage of gas through the meter to rotate the cam-wheel in the opposite direction and close said supply-valve, substantially as set forth.

4. 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 cam-wheel having an annular cam-groove in one side thereof, said groove having one end thereof brought inward toward the center of the cam-wheel and an intermediate inward depression or break in its regular lines between the ends of said groove, a connecting-rod having a roller at one end adapted to travel in said cam-groove and connected at its other end to the mechanism for opening and closing the supply-valve, coin-controlled mechanism adapted to rotate the cam-wheel in one direction and thereby open the supply-valve, and mechanism controlled by the passage of gas through the meter to rotate the cam-wheel in the opposite direction and close said supply-valve, the described inward depression or break in said cam-groove serving to check the supply of gas when the roller on the connecting-rod reaches said point without wholly shutting off the supply, substantially as set forth.

5. 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 cam-wheel within the meter-casing 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 the casing to expose said numbering, a cam-groove in one side of said cam-wheel, a connecting-rod having a roller at one end adapted to travel in said cam-groove and connected at its other end to the mechanism for opening and closing the supply-valve, coin-controlled mechanism adapted to rotate the cam-wheel in one direction and thereby open the supply-valve and mechanism controlled by the passage of gas through the meter to rotate the cam-wheel in the opposite direction and close said supply-valve, substantially as set forth.

6. 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 cam-wheel 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 cam-groove in said cam-wheel, a connecting-rod connected to the mechanism for controlling the movement of the supply-regulating device and having a roller adapted to travel in said cam-groove, coin-controlled mechanism adapted to rotate the cam-wheel in one direction, and thereby release the supply and mechanism controlled by the delivery of the product to rotate the cam-wheel in the opposite direction and cut off the supply.

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,
B. C. ROLOFF.