No. 614,103. Patented Nov. 15, 1898.

A. C. HAMMOND, JR. & F. WEEGMANN.

COIN CONTROLLED DELIVERY APPARATUS.

(Application filed Sept. 4, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

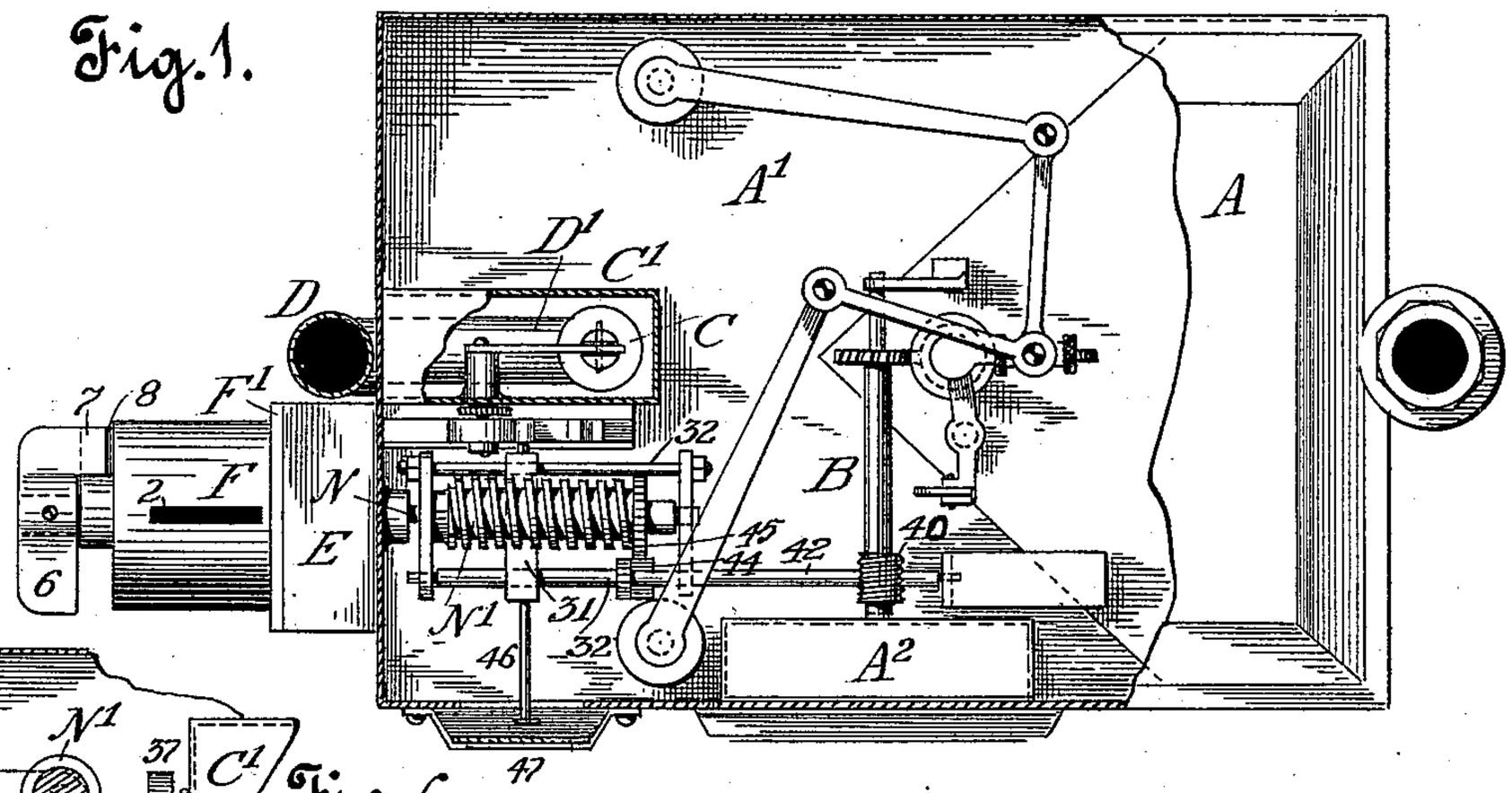


Fig. 6.

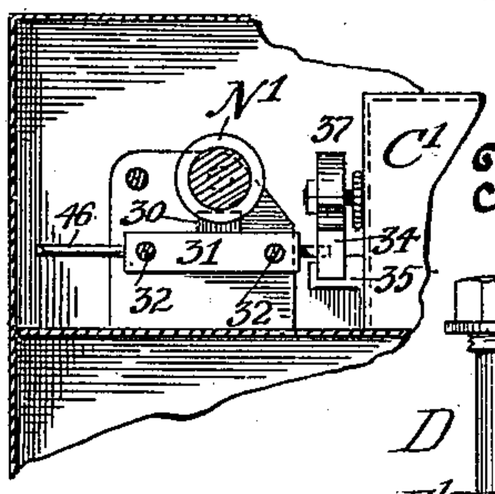


Fig. 2.

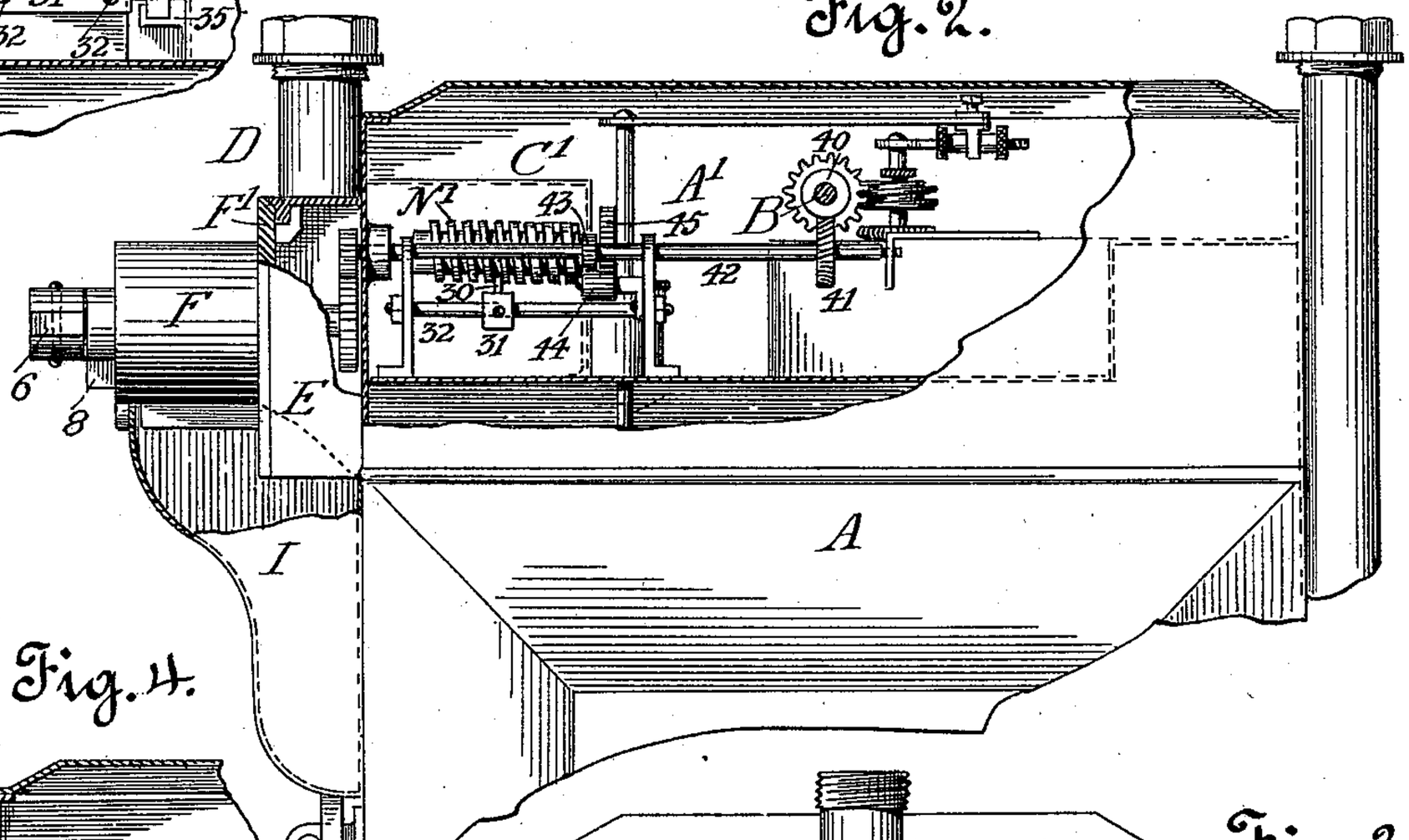


Fig. 4.

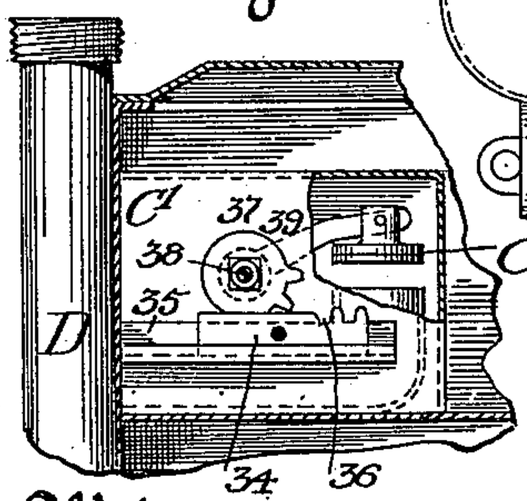
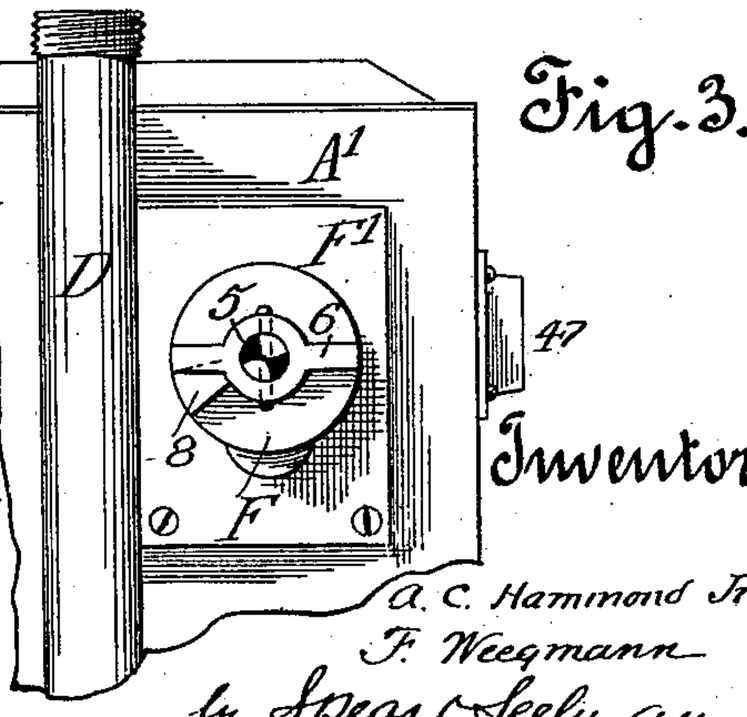


Fig. 5.

Fig. 3.



Witnesses.

F. E. Montenerde.

Louis J. Dick.

Inventors

A. C. Hammond Jr.

F. Weegmann

by Spear & Seely Atty's

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Fig. 7.

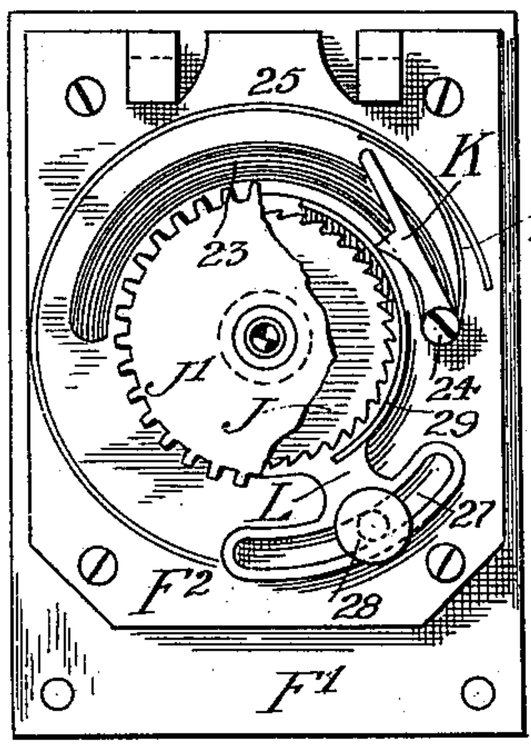


Fig. 13.

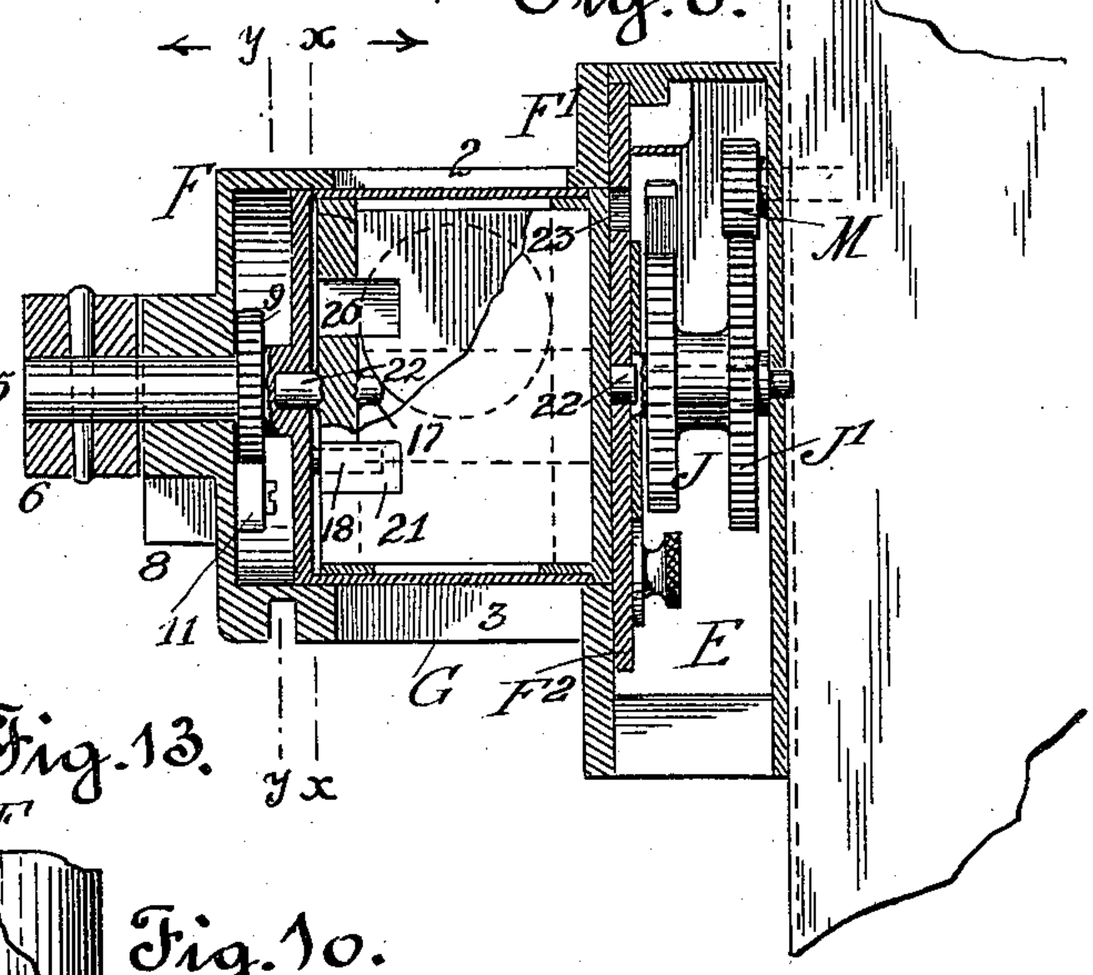


Fig. 8.

Fig. 10.

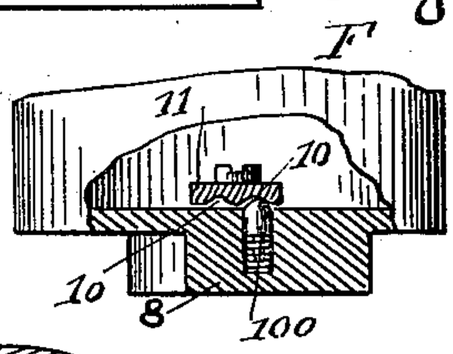


Fig. 9.

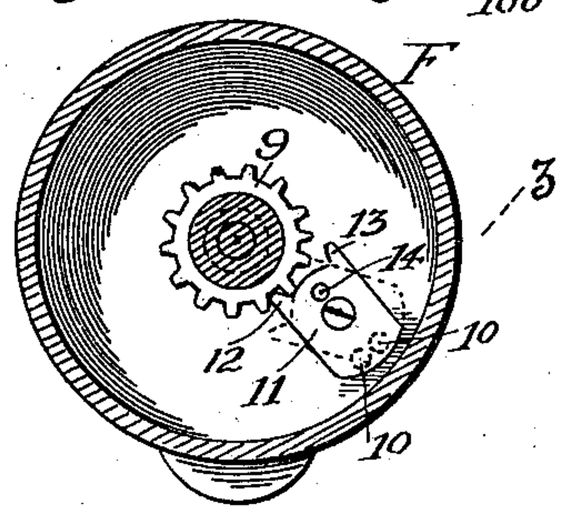


Fig. 11.

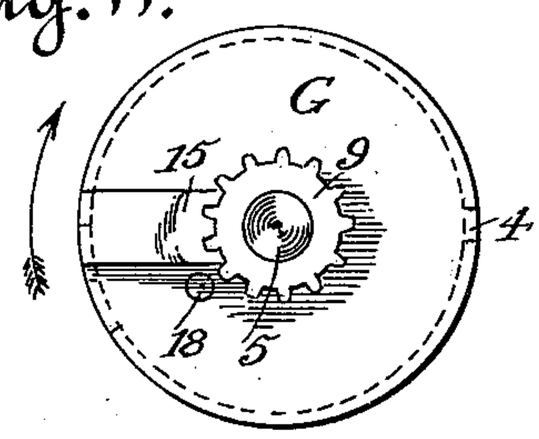
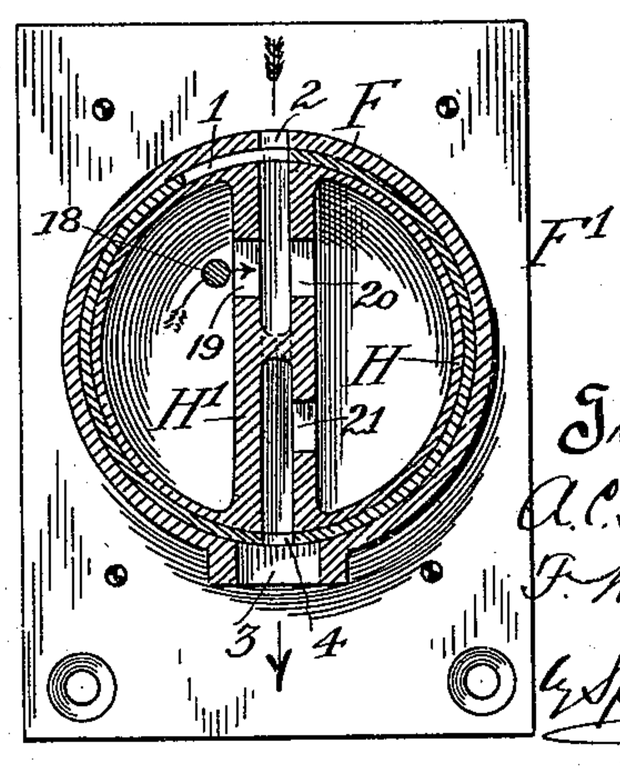


Fig. 12.



Witnesses.

F. H. Montgomery.

Francis J. Dieks

Inventors

A. C. Hammond Jr.

F. Weegmann

by Spear & Seely

Attorneys

UNITED STATES PATENT OFFICE.

ANSELM C. HAMMOND, JR., OF ALAMEDA, AND FREDERICK WEEGMANN, OF SAN FRANCISCO, CALIFORNIA, ASSIGNORS TO THE CALIFORNIA PREPAYMENT METER COMPANY, OF CALIFORNIA.

COIN-CONTROLLED DELIVERY APPARATUS.

SPECIFICATION forming part of Letters Patent No. 614,103, dated November 15, 1898.

Application filed September 4, 1897. Serial No. 650,645. (No model.)

To all whom it may concern:

Be it known that we, ANSELM C. HAMMOND, Jr., residing at Alameda, in the county of Alameda, and FREDERICK WEEGMANN, residing in the city of San Francisco, county of San Francisco, State of California, citizens of the United States, have invented certain new and useful Improvements in Coin-Controlled Delivery Apparatus; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to coin-controlled delivery mechanism, and more particularly to such mechanism when used in connection with the sale of a commodity delivered by its own pressure, such as illuminating-gas. The coin apparatus is, however, complete in itself and is capable of use in connection with different kinds of delivery mechanism, and thus forms one part of the invention, while its combination with a mechanism of the kind mentioned and the constructions and arrangements required to make such combination effective form other parts of the invention.

In the accompanying drawings and in the following description we have shown and described the entire invention as applied to an ordinary gas-meter. In such a construction the coin-controlled apparatus performs the function of opening the gas-inlet valve; but it also places certain other mechanism in condition and position to be operated by the gas-pressure so long as such valve is open, in which operation the valve is finally closed after a predetermined amount of gas has been supplied.

The invention also includes simple means for varying the amount of gas supplied for a coin of a certain denomination according to the rate at which gas is furnished to the consumer.

In the accompanying drawings, Figure 1 is a plan view of a gas-meter with the top plate removed and with the external coin-receiver attached. Fig. 2 is a longitudinal section of the upper part of the meter, which contains the mechanism shown in Fig. 1. Fig. 3 is an end elevation of the coin-receiver. Fig. 4 is a detail section showing the gas-inlet-valve chamber broken away to show the valve and the connection for directly operating such valve. Fig. 5 is a similar view with the valve closed. Fig. 6 is a detail cross-section illustrating the same mechanism. Fig. 7 is an elevation looking toward the right side of Fig. 8, which is a longitudinal section of the coin-receiving mechanism. Fig. 9 is a section on *y y* of Fig. 8. Fig. 10 is a section on *x x* of Fig. 8. Fig. 11 is an end view of the inner shell of the coin-receiver. Fig. 12 is a cross-section similar to Fig. 10, but showing the parts of the coin-receiver in position to receive the coin. Fig. 13 is a detail section of the pawl-and-ratchet device shown in Fig. 9.

In the drawings, A represents an ordinary gas-meter provided with an upper compartment A′, which contains the usual connected mechanism for operating the register. The register-train within a case A^2 is not shown, but it derives its motion from a shaft B, driven by the mechanism referred to in a well-known manner when gas is passing through the meter. The gas is admitted to the meter through a valve C, which opens and closes the end of a branch D′ from the gas-supply pipe D, and is contained within a casing C′. When this valve is open, the mechanism of the meter and its register are being operated in the usual way; but in commencing this description it is assumed that the valve is closed, in order that we may first describe how such valve is opened by a coin-controlled apparatus and shall thereafter explain how the gas-pressure in operating the meter-register transmits power to close the gas-inlet valve.

The coin-controlled apparatus is supported outside the meter at the inlet end and preferably near the top, as shown. A casing E is secured to the meter, having an open front, which is closed by the back plate F′ of a fixed cylinder F, so that the casing and cylinder together form a hollow chamber, which incloses the coin mechanism. Within this cylinder is a movable shell G, closed toward the front, but open toward the meter. This shell is provided with a slot 1 of proper size to receive a coin of a certain denomination, which may be caused to register with a slot 2 at the

top of the cylinder F. Secured to the closed end of the shell G is a pin or shaft 5, which projects through the front of the cylinder and carries the handle 6, Figs. 1 and 8, by which the shell can be turned within the cylinder in both directions. The revolution of the shell is, however, not complete, since it is limited in both directions by the bearing of a projection 7 of the handle upon a fixed stop 8 on the end of the cylinder. While, as stated, the handle can be turned to revolve the shell in both directions, yet it is compelled to complete its movement in either direction before being reversed, being locked against such reverse movement by a ratchet mechanism. (Shown in Figs. 8, 9, and 11.) The shaft 5 carries a tight pinion 9, with which engages a pawl 11, pivoted to the inner surface of the cylinder end and having two inclined teeth 12 13 and a projecting pin 14. By reference to Fig. 9 it will be seen that the pinion can turn only in one direction, the engagement of the tooth 12 preventing any backward movement. A cam 15 is formed upon the adjacent end of the shell G, Fig. 11, which as the handle approaches the stop 8 bears upon the pin 14 and throws the pawl to the position of the dotted lines in Fig. 9, disengaging the tooth 12 and engaging the tooth 13 with the pinion. The pinion and shell can now be moved in the opposite direction, until it approaches the stop again, when the same action takes place. The pawl is also provided with two depressions 10, (dotted lines, Fig. 9,) which slip over a spring-stud 100 on the head of the cylinder whenever the pawl is reversed, and so hold it in either position, there being enough play allowed the stud in either depression to permit the teeth of the pinion to slip over either tooth 12 or tooth 13, according to the direction in which the pinion is moving. Within the shell G is a coin-carrier H, provided with trunnions 22, the body of which is tubular and concentric with the shell G, within which it fits. The part which actually receives the coin is a holder H′, arranged diametrically in the tubular part of the carrier, and comprises two parallel walls separated so as to produce an intermediate passage 16. By a proper manipulation of the handle the slots 1 and 2 can be brought into line with the passage 16, as shown in Fig. 12. A coin of proper size dropped through the registering slots enters the receiver and rests upon a pin 17 and against the opposite wall of the receiver, Fig. 8. The coin in this position becomes a part of the mechanism and enables the coin-carrier to be moved with the shell G, such movement, through connections yet to be described, controlling the opening of the valve which delivers the gas or other commodity on sale. Projecting inwardly from the end of the shell G is a pin 18, which bears upon the coin, slots 19 and 20 being formed in the walls of the coin-holder to permit the entrance of the pin. The shell and coin-holder are thus turned together, the pawl previously described preventing any backward movement until a half-revolution has brought the slot 1 and the coin into line with a discharge-slot 3 in the lower side of the cylinder F, through which the coin drops into a receptacle I, Fig. 2. As soon as this movement has commenced the external coin-slot 2 is closed by the body of the shell G, so that the admission of another coin is prevented as well as withdrawal of the coin last deposited. At the time the coin is finally discharged the handle is stopped and the pawl-and-ratchet mechanism reversed, as before described, so that the shell G is free to turn in the opposite direction. After making about half a turn the pin 18 strikes the solid wall of the coin-holder, which is now at the top, and pushes it around to the position of Fig. 10, with the coin-slot closed by the shell. From the position of Fig. 10, when the stops take effect and the pawl is reversed again, it is necessary to move the pin 18 in the direction of the arrow of Fig. 12 in order to get the coin-slots in line and then if another coin is dropped to proceed as before; but supposing no coin is dropped and the handle is turned in the only direction in which it can turn the pin 18 passes through the slots 19 and 20 without affecting the coin-holder and continues its partial revolution until the handle is stopped. In order to permit it to complete its motion and enable the reversing of the pawl to be accomplished, one wall of the coin-holder on what is the lower side in Fig. 12 is provided with a slot 21, into which the pin 18 can enter as far as it could if it were bearing upon a coin; but the stops and the pawl-reverser act in time to prevent the pin from striking the opposite solid wall of the coin-holder. This will be well understood from Fig. 12 if we imagine the pin 18 to make about half a turn with the arrow, enter the slot 21, and stop, the coin-holder remaining immovable. It will thus be seen that it is necessary for a coin of the proper denomination to be placed in the carrier to enable the latter to be revolved. A coin of smaller size will simply drop through the slot or passage 16, and to keep the passage clear will fall through a slot 4, provided in the shell G, into the final receptacle. This slot 4 is placed opposite the admission-slot 1 of the shell, but is not long enough to receive a coin of proper size. Figs. 8 and 12, taken together, show the relative arrangement of these slots which would permit a smaller coin to fall unobstructed by the pin 17. Of course such coins if dropped by mistake could always be reclaimed by the user of the device from the collector.

The movement of the coin-holder in the proper direction operates other mechanism which controls the delivery of a specified amount of gas or liquid or other commodity, and in commencing the description of such mechanism we refer to Figs. 7 and 8. To the back plate F′ of the cylinder F is secured an-

other plate F^2, having a central hole, which forms a support for the trunnion 22 of the coin-holder. Upon this trunnion and in the wall of casing E adjacent to the meter is journaled the hub of a ratchet J, made integrally with a gear J'. The plate F^2 has an arc slot 23, through which projects a pin 24, secured to the coin-holder and carrying a pivoted pawl K. A curvilinear guideway 25, together with a spring 26, presses the pawl inwardly to engage with the ratchet J. The movement of the coin-carrier, transmitted through the pawl, operates the ratchet and its gear, the pawl moving in the arc slot. The return movement of the coin-carrier and of this pawl is of course ineffective to operate the ratchet. Fig. 7 shows also a simple device for regulating the time of engagement of this pawl and ratchet. The movement of the coin-carrier is intended to open a valve which will be kept open long enough to permit a certain amount of a commodity at a certain price to be delivered. As the price of the commodity may vary in different places, it is evident that at some places more or less must be delivered than at others. The amount being dependent upon the extent of movement given to the ratchet J and to the mechanism deriving motion from it, it is evident that by regulating the engagement of the pawl K the amount delivered will also be regulated. This is accomplished in a very simple way and without requiring any change in the gearing by interposing between the pawl and ratchet an adjustable guard L, which is a plate mounted upon the central pin and having a curved flange 29 and a slot 27, provided with a set-screw 28. As shown in Fig. 7 the pawl cannot engage with the ratchet until it has passed over this guard-flange, and hence by adjusting the guard the movement of the pawl will be effective on the ratchet to a greater or less extent and the motion given the ratchet will be in proportion to the rate or price of the commodity.

Having in this case shown the coin-operated mechanism in connection with a gas-meter, we now describe the connections between such a meter and the said mechanism. From the gear J' a pinion M gears up a shaft N, which extends into the upper compartment of the meter and carries a screw N'. Engaging with this screw is a projection 30 on a cross-head 31, the latter traveling on guides 32 and preferably having long bearings on said guides to insure steadiness of motion. It will now be understood that the motion of the coin-holder following the reception of a coin and continued until the coin has been discharged will, by rotating this screw, give to the cross-head a certain regulated amount of travel, greater or less according to the price rate of the gas or other commodity. This movement of the cross-head opens the valve for discharging the commodity, which in this case is the gas-inlet valve C. Referring first to Fig. 5 in connection with Fig. 1, it will be seen that the cross-head 31 is connected to a slide 34, which moves in a guide 35 on the side of the valve-chamber C' and which incidentally tends to prevent any play in the loose bearings of the cross-head. This slide is really a rack for a small part of its length, although the greater part is a flat surface. It is provided with one or more notches 36, with which, when the valve C is closed, engage a tooth or teeth on the edge of a disk 37, fixed on the valve-shaft 38. The valve is suspended from an arm or crank 39 of the shaft last named and is lifted and dropped by the partial rotation of the disk. From the position of Fig. 5 the motion of the cross-head produces the position of Fig. 4, the disk resting upon the smooth surface of the slide 34 and so holding the valve open. Such disk is preferably flattened, as shown, to take a square bearing on the slide. The valve being open, the meter commences to operate the register-shaft B. Upon this shaft is a worm 40, engaging with a gear 41, secured upon a shaft 42, and the shaft 42 is geared to the screw-shaft N by pinions 43 44 45, the screw-shaft being thus geared down to the proportionately slow movement of the meter-register. The screw commences to revolve in the reverse direction to that given it by the coin mechanism, moving the cross-head 31 upon its guides. The valve is kept open by the bearing of the disk 37 upon the slide 34 until such slide reaches the point when a tooth of the disk can engage with a notch 36. At this point the valve commences to slowly close and to give warning of its closing by diminishing the gas-pressure, such diminution continuing until the valve is entirely closed and the gas cut off. The cross-head 31 carries a pointer 46, which extends through a slot in the meter and indicates by traveling along a suitable scale, visible through a glass 47, the amount of gas purchased at each insertion of a coin, such pointer returning and stopping at zero on the scale whenever the valve closes.

Within the amount of gas indicated by the travel of the cross-head a succession of coins of the proper denomination can be dropped to secure a larger continuous supply of gas, since each successive coin allows the cross-head to be moved a farther and equal distance. Thus gas can either be prepaid up to the full capacity of the mechanism for controlling its supply or can be purchased in small quantities by dropping separate coins and exhausting the supply represented by each.

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

1. In a coin-controlled delivery apparatus and in combination, a casing secured to the outside of the delivery apparatus, a cylinder attached to said casing, a movable coin-holder within the cylinder having a stud projecting through a slot in the casing and carrying a pawl, a rotary shaft connected to the delivery

apparatus, a ratchet-wheel loosely mounted within said casing, and gearing connecting the ratchet-wheel to said rotary shaft.

2. In a coin-controlled delivery apparatus, and in combination, a stationary cylinder, a hollow shell movable within the cylinder and provided with an exterior handle, a stop for limiting the movement of said handle in both directions, a double-acting pawl-and-ratchet connection between the shell and cylinder, for preventing a reverse movement of said shell until it has completed its movement in either direction, upper and lower coin-slots in the cylinder, a coin-slot in the shell adapted to register alternately with said slots, a coin-holder within the shell, and operated by its movement, and delivery mechanism connected to and set in operation by said coin-holder.

3. In a coin-controlled delivery apparatus, and in combination, a stationary cylinder, a hollow shell movable in both directions within the cylinder and having an exterior handle, a stop for limiting the movement of the handle in both directions, means for preventing a reverse movement of the shell until it has completed its movement in either direction, upper and lower coin-slots in the cylinder, a coin-slot in the shell adapted to register alternately with said slots, a coin-holder within the shell and operated by its movement, and delivery mechanism connected to and set in operation by said coin-holder.

4. In coin-controlled delivery apparatus the combination with a hollow stationary cylinder, having upper and lower coin-slots, of an interior hollow shell, capable of rotary motion, a stop for limiting such motion in both directions, a double-toothed pawl on said cylinder, a toothed wheel on the shell, and a cam carried by said shell, adapted to disengage one of said pawl-teeth from and reëngage the other tooth with said wheel at the limit of movement of the shell in each direction, a coin-holder movable with the shell through the agency of a coin, and delivery mechanism connected to and set in operation by said coin-holder.

5. In coin-controlled delivery apparatus the combination with a stationary cylinder having coin-slots, and provided with an external stop, of a movable shell within said cylinder, having a projecting shaft and handle, a toothed wheel fixed upon said shaft within the cylinder, a pawl pivoted to the cylinder-head, and having two teeth for alternately locking the shell against motion in one direction, but permitting it in the other, a yielding pin adapted to engage with one of two depressions in said pawl, when the shell is moving in the direction permitted it, and a cam carried by the shell for positively changing the position of said pawl when the shell reaches its limit of motion in either direction, to disengage one of said teeth and engage the other.

6. In coin-controlled delivery apparatus and in combination, a stationary cylinder, a shell movable within the same, a coin-holder within the shell having parallel walls forming a coin-passage arranged diametrically to said shell, means for sustaining a coin within said coin-passage, a pin on said shell for operating the coin-holder through the agency of the sustained coin, and said walls having slots oppositely placed therein; whereby the pin has access to the sustained coin, but can move through said slots in the absence of a coin; and whereby also, after the coin-holder has been moved in one direction by means of the coin, said holder can be moved in the opposite direction by causing the pin to bear against the solid part of one of said walls.

7. In coin-controlled delivery apparatus the combination with a movable coin-holder, of a rotary shaft connected to the delivery apparatus, a ratchet geared to said rotary shaft, a pawl carried by the coin-holder and having a constant limit of movement, and an adjustable guard, for preventing the engagement of said pawl with said ratchet, and thereby varying the extent of revolution of said shaft.

8. In coin-controlled delivery apparatus, the combination with a rotary coin-holder provided with actuating mechanism, and adapted to receive, hold and discharge a coin, of a pawl carried by said holder, a loosely-mounted ratchet-wheel, a shaft geared to said ratchet-wheel so as to derive from it motion in one direction, and an adjustable plate having a flange interposed between said pawl and ratchet, substantially as and for the purpose set forth.

9. In coin-controlled delivery apparatus, the combination with a rotary coin-holder, provided with actuating means, and adapted to receive, hold and discharge a coin, of a pawl carried by said holder, a loosely-mounted ratchet-wheel, a shaft geared to said ratchet-wheel so as to derive motion in one direction from said ratchet, a slotted plate having a flange interposed between said pawl and ratchet, and a set-screw for securing said slotted plate and flange at different adjustments, substantially as and for the purpose set forth.

10. In coin-controlled delivery apparatus, the combination with coin-controlled operating mechanism, of a screw-shaft, a cross-head moving in engagement therewith, and impelled in one direction by the operation of the coin-controlled mechanism, a slide connected to the cross-head, and having a notch, a journaled valve-shaft carrying a valve, a disk on said shaft having a tooth adapted to engage with said notch when the valve is closed, and to bear upon the said slide when the valve is open, and so keep it open, and means operated by the passage of a commodity through said valve, for reversing the movement of said screw and cross-head, and closing said valve.

11. The combination with a screw-shaft and with coin-controlled mechanism for turning the same in one direction, of a movable cross-head in engagement with said screw-shaft, a straight guide, a slide movable thereon and

connected to the cross-head, a journaled valve-shaft carrying a valve, and a toothed disk fixed on the valve-shaft; the surface of the slide being partly plain and partly formed into a rack, and said valve being opened and closed by the engagement of said rack and disk and held open by the bearing of said disk on the plain part of the slide.

12. In combination with the screw-shaft and mechanism for operating it in both directions, a traveling cross-head, a slide having its surface partly plain and partly notched, a toothed disk, having its edge partially flattened, a valve-shaft upon which said disk is secured, and a valve connected to said shaft, said valve being opened and closed by the engagement of said notches and teeth and held open by the bearing of said flattened edge upon the slide.

13. In coin-controlled delivery apparatus, the combination with a movable shell having an eccentric pin, of means for turning said shell in both directions, means for permitting a reverse movement of said shell operated at the completion of its movement in either direction, a coin-holder within the shell having diametrical parallel walls forming a coin-passage, an obstruction in said coin-passage to act as a stop for a coin of proper size, oppositely-placed slots in the walls of the coin-passage, situated above the obstruction, and a single slot in one of said walls situated below the obstruction; whereby the said pin, in the absence of a coin, can move unobstructed across the coin-passage, and can complete its movement in one direction without moving the coin-holder, by entering said single slot.

In testimony whereof we have affixed our signatures, in presence of two witnesses, this 24th day of August, 1897.

ANSELM C. HAMMOND, JR. [L. S.]
FREDERICK WEEGMANN. [L. S.]

Witnesses:
HARRY J. LASK,
L. W. SEELY.