

(No Model.)

6 Sheets—Sheet 1.

J. F. SAWER & J. L. PURVES.
PREPAYMENT SALE AND DELIVERY MECHANISM.

No. 468,999.

Patented Feb. 16, 1892.

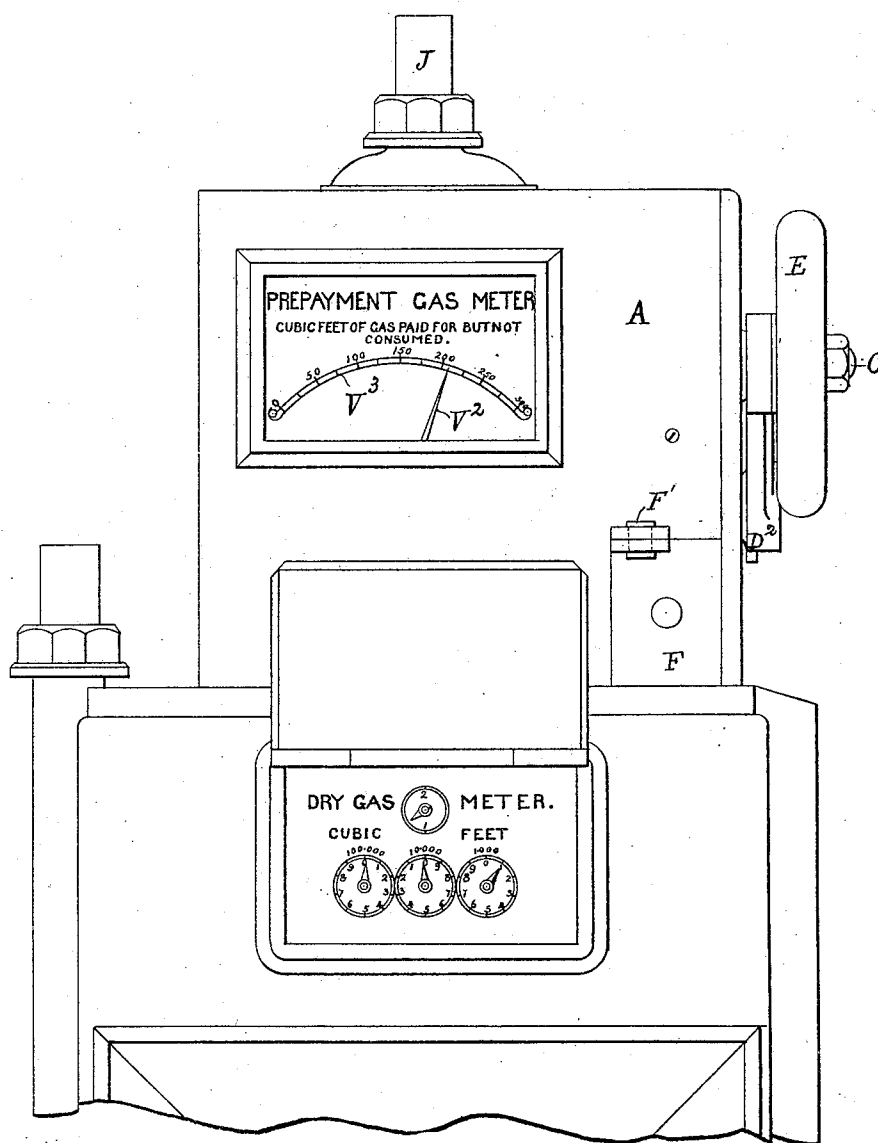


FIG. 1.

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J. L. Purves.
by
Wm. Brown & Co.
J. H. H.

(No Model.)

6 Sheets—Sheet 2.

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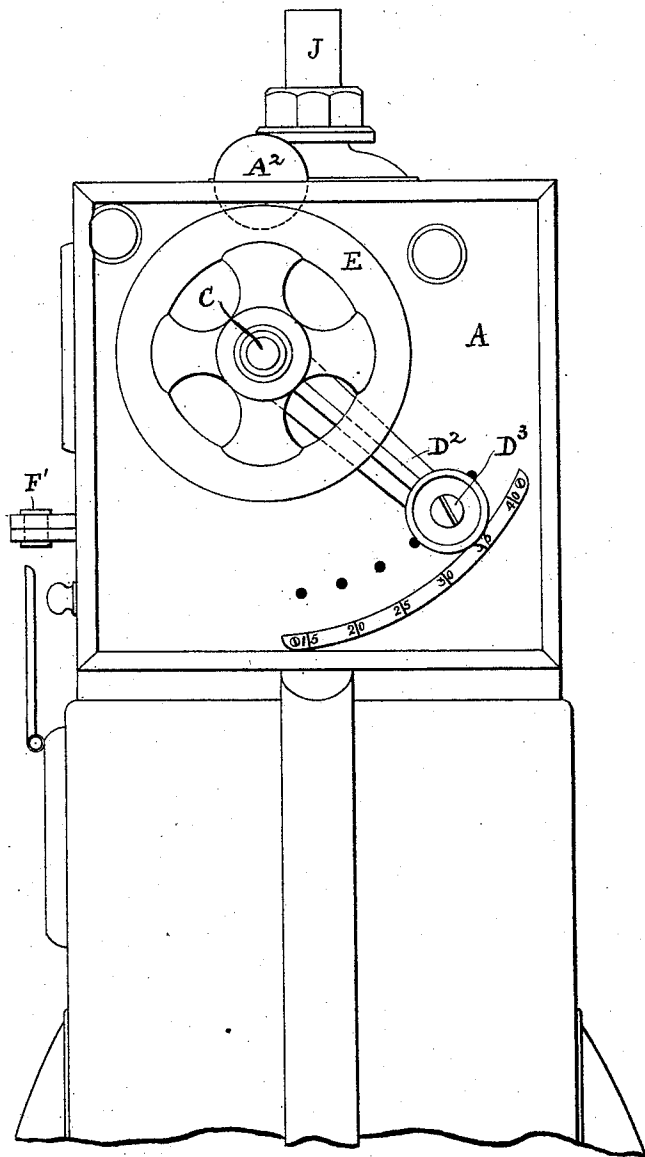


FIG. 2.

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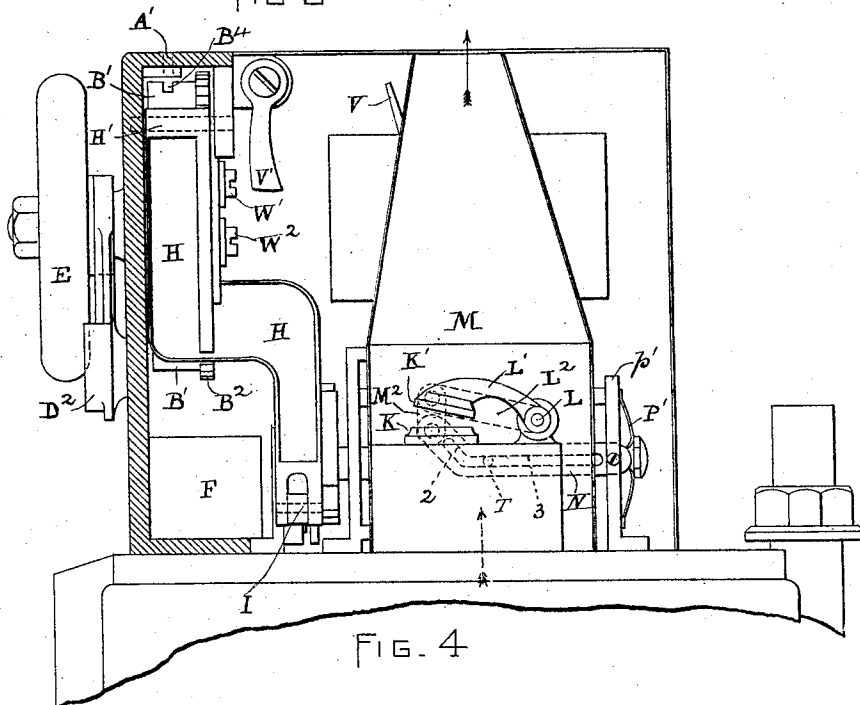
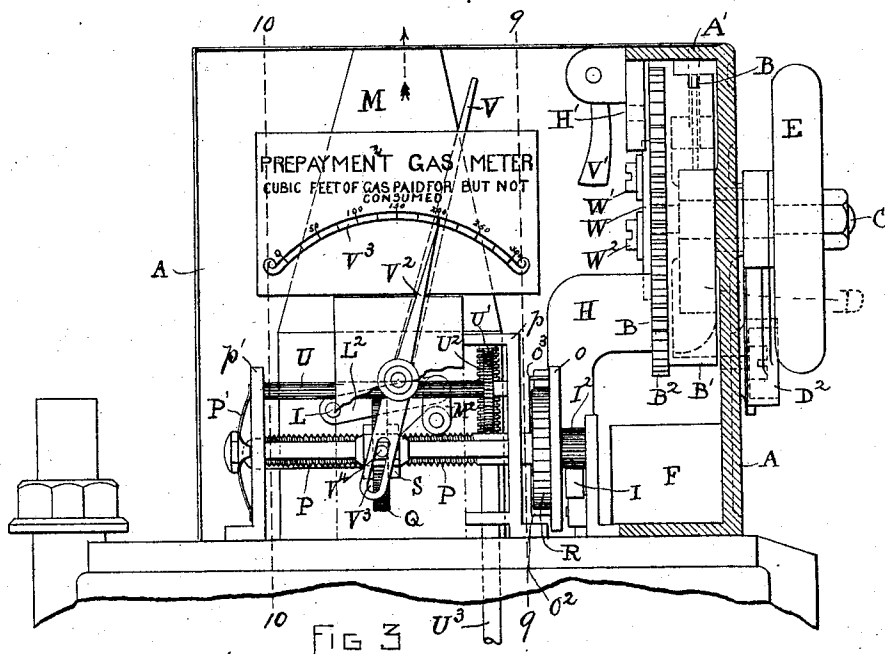
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6 Sheets—Sheet 4.

J. F. SAWER & J. L. PURVES.
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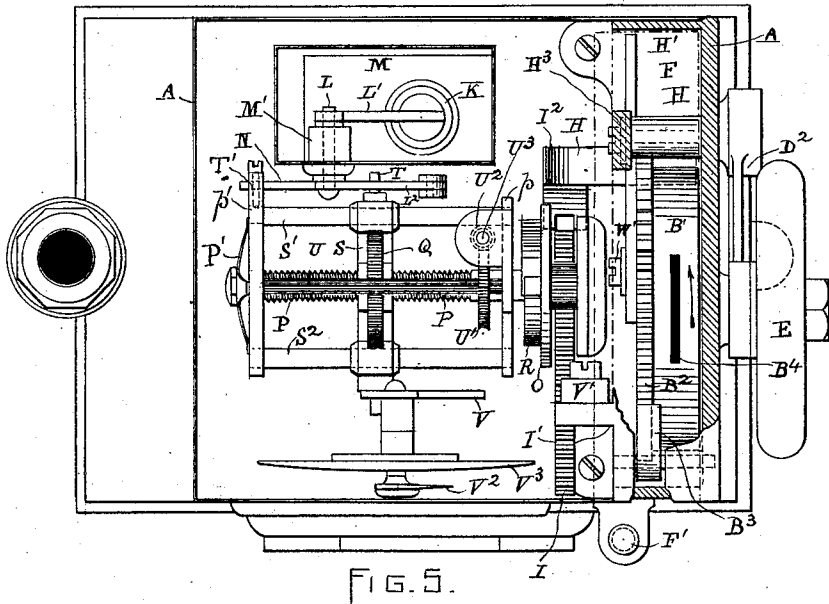


FIG. 5.

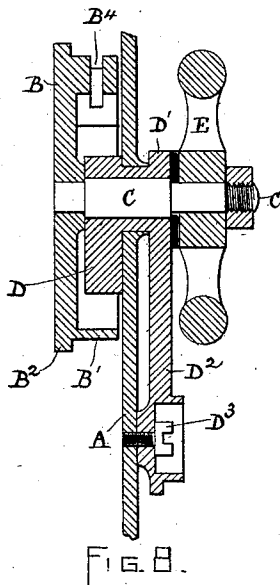


FIG. 6.

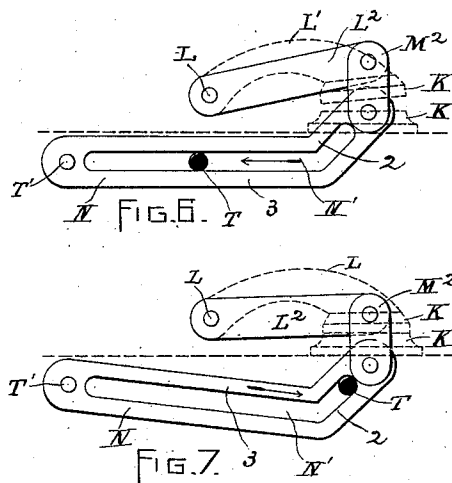


FIG. 7.

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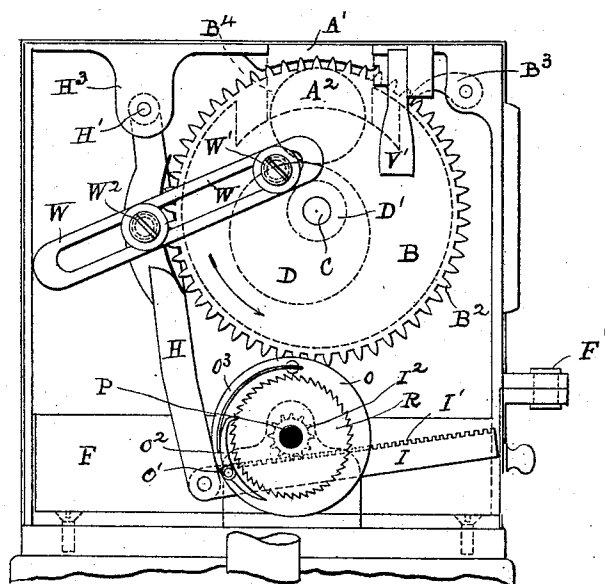


FIG. 9.

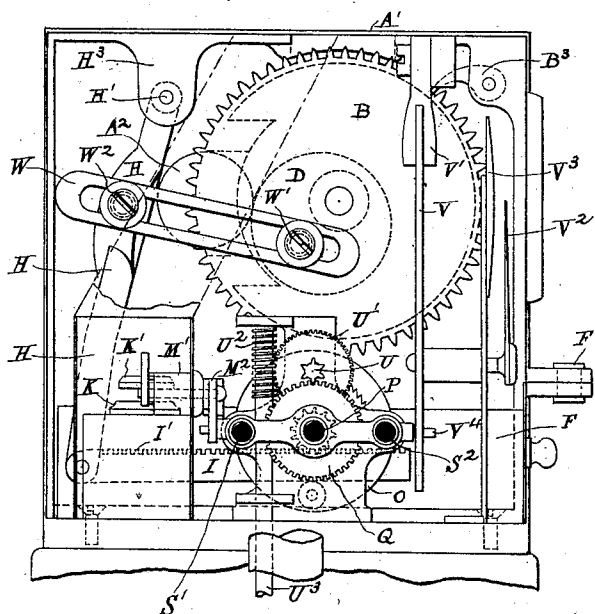


FIG. 10.

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J. L. Purves.
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Wm. Brown & Co.,
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(No Model.)

6 Sheets—Sheet 6.

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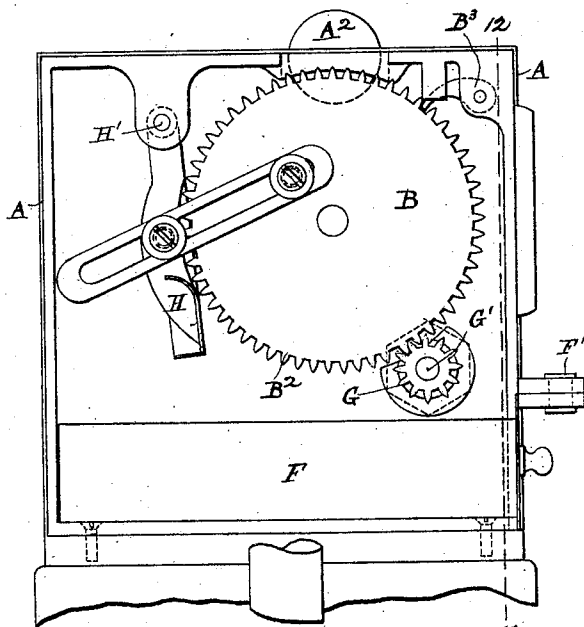


FIG. 11.

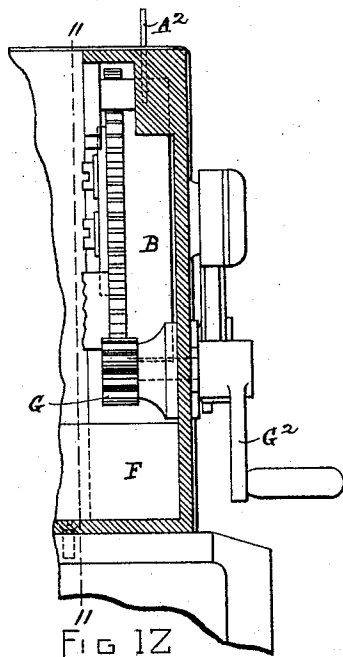


FIG 12

WITNESSES

A. J. Harrison.
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J. L. Purves,
Wright, Brown & Grosvenor,
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UNITED STATES PATENT OFFICE.

JAMES FEATHAM SAWER AND JAMES LYON PURVES, OF MANCHESTER,
ENGLAND.

PREPAYMENT SALE AND DELIVERY MECHANISM.

SPECIFICATION forming part of Letters Patent No. 468,999, dated February 16, 1892.

Application filed September 21, 1891. Serial No. 406,388. (No model.) Patented in England February 13, 1891, No. 2,626.

To all whom it may concern:

Be it known that we, JAMES FEATHAM SAWER and JAMES LYON PURVES, of Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Prepayment Sale and Delivery Mechanisms, (for which we have obtained Letters Patent in Great Britain, dated February 13, 1891, No. 2,626,) of which the following is a specification.

Our invention relates to that class of mechanism which is employed to deliver articles or commodities after the value thereof has been prepaid in coin or its equivalent.

Our invention has for its object, first, to enable each coin, in its passage from the receiving-slot to the receptacle in which the coins are accumulated, to be positively moved with sufficient force to actuate mechanism controlling the delivery of the commodity; and, secondly, to provide improved delivery mechanism adapted to be actuated by the above-indicated movement of a coin.

The invention also has for its object to provide means whereby the effect of the operation of the coin can be varied at will, so as to give a greater or less range of action to the parts by which the delivery of the commodity sold is effected.

Our invention consists in the improvements hereinafter described and claimed.

In order that our said invention may be the better understood and the more readily carried into effect, we have hereunto appended sheets of drawings, wherein—

Figure 1 is a front view of a gas-meter with our mechanism attached. Fig. 2 is a right-hand-side view of the same. Fig. 3 is a front elevation of the mechanism with the front of the case removed. Fig. 4 is a back elevation of the mechanism in partial section. Fig. 5 is a plan view of the mechanism with the top of the case removed. Fig. 6 is a front view of the slotted bar and its connection with the valve in the position it is in when the valve is opened. Fig. 7 is a similar view of the slotted bar when the valve is closed. Fig. 8 is a section through the coin-disk, eccentric, and eccentric-arm. Fig. 9 is a transverse section on the line 9 9 in Fig. 3. Fig. 10 is a

transverse section on the line 10 10 in Fig. 3. Fig. 11 is an end view of a modification of our invention on the line 11 11 in Fig. 12, and Fig. 12 is a section on the line 12 12 in Fig. 11.

The reference letters and figures relate, respectively, to the same parts in all the drawings.

In carrying our said invention into effect we inclose the various parts in a suitable case or framing A, which can be fixed in or attached in any convenient position, and which may be constructed in one or more pieces, as desired.

As shown in Figs. 1 and 2, our mechanism is attached to the frame of an ordinary dry gas-meter; but if the mechanism or any portion of it is applied to the purpose of delivering any commodity other than gas the frame can be fixed in a suitable position to effect its purpose.

Within the case A we provide a disk B, having a cylindrical flange B', said disk and flange being hereinafter called the "coin-carrier." Said carrier is attached to a spindle C, passing through and borne by the frame A.

Upon the spindle C, as shown more particularly in Fig. 8, we mount a device adapted to displace or force outwardly a coin moved forward by the rotation of the carrier. Said displacing device is preferably an eccentric D, inclosed within the coin-carrier B and provided with a boss D', extending through the frame and surrounding the spindle C.

To the outer end of the boss D' an arm D² is attached, by means of which the position of the center of the eccentric in a circle described through it from the center of the shaft can be regulated, as desired. To enable the position of the eccentric, when once established, to be maintained, we provide means, such as a screw D³, entering one of a series of screw-holes in the case A, said screw locking the arm D². The head of the screw D³ can be sunk into the arm D², so as to permit the insertion of a seal, or the arm may be locked and sealed by any well-known or suitable method. We also fix to the case an indicator, (shown in Fig. 2,) by which the position of the eccentric can be readily fixed to enable the mechanism to be so operated as to

deliver a certain definite quantity of gas or other commodity. It will be readily understood that instead of an eccentric a cam of suitable shape may be used, and it may be adjusted in a similar manner; but we prefer to employ an eccentric.

The end of the spindle C, which is without the case A, may have fastened on or attached to it a hand-wheel or handle E, by means of which the coin-carrier B can be rotated. We provide the coin-carrier B with teeth B² on its edge, with which a detent-pawl B³ (shown in Figs. 9 and 10) engages to prevent backward rotation of said carrier.

In the periphery of the coin-carrier B a slot B⁴ is formed, which is wide enough to freely receive a coin A² and maintain it in position, where it is introduced through a slot A', formed in the case A. The slot B⁴ penetrates the flange B' and allows the coin to fall into contact with the eccentric D, as shown in Fig. 9. When a coin is introduced into the slot A', it drops into the slot of the coin-carrier, when said slot coincides with the slot A', until it rests upon the edge of the eccentric D. When the coin A² is in the position shown in Fig. 9, the edge of the coin A² is nearly level with, but does not protrude beyond, the periphery of the flange B'. When the handle or wheel E is turned so as to rotate the coin-carrier B, the coin A² is carried forward by the carrier and is, by reason of the position of the eccentric D, gradually displaced or pushed outwardly beyond the flange B'. When the coin-carrier B has made half a revolution, the coin A² falls out of the carrier into a drawer F, provided for its reception. The drawer F can be locked or sealed, as at F', by a stamped seal in the manner which is well known and which is common to many appliances of this nature. It will be obvious that the extent of the protrusion of the coin A² from the carrier will be largely regulated by the position of the center of the eccentric about the center of the spindle C, and may be arranged so as to be greater or less, as desired, by setting and securing the arm D², as hereinbefore described. After the fall of the coin A² the revolution of the carrier B brings the slot B⁴ again under the slot A', so as to permit of the introduction of another coin.

In order to prevent the insertion of a coin or its removal after it has performed its work, but prior to its discharge into the drawer F by the introduction of a wire or other similar device, and in order also to prevent the mechanism actuated by the coin being operated by any other means, we form the portion of the case through which the slot A' extends so that at the bottom end of the slot A' is close to the periphery of the coin-carrier, so that while the carrier is allowed to rotate freely no instrument can be passed within the case or frame. The teeth B² and detent B³, while permitting the forward movement of the carrier, entirely prevent it from being turned

back and insures the discharge of the coin A² into the drawer F in the manner described.

In the modification shown in Figs. 11 and 12 the coin-carrier is geared with a pinion G, fixed on the end of a short spindle G', borne by the frame A and having a handle G² fixed on the other end, by which it can be rotated from without.

The combined forward and outward movements of the coin, produced as above described, are caused to open a valve or cut-off and permit the delivery of gas or other commodity, suitable mechanism being employed adapted to be actuated by the coin while it is being thus moved. Said mechanism will now be described. We arrange a lever H in a position adjoining the coin-carrier and hinge it on a pin H' or in a similar manner, so that it has freedom of oscillatory movement. The pin H' is fixed in or attached to an ear H³ in the casing. The position of the lever H relatively to the coin-carrier is such that when the coin A² is protruded beyond the periphery of the coin-carrier in its rotation with the coin-carrier, as hereinbefore described, and when the coin-carrier has made a quarter of a revolution, it presses upon the lever H and causes it to move upon its center, as shown in Fig. 10. The extent of the movement communicated to the lever H will be proportionate to the extent of the protrusion of the coin A² beyond the periphery of the coin-carrier, this being regulated by the eccentric D, as already described. We joint or couple to the oscillating lever H a bar, rod, or lever I, hereinafter called the "communicator," by means of which we communicate the motion given to the lever H to the other portions of the mechanism. The mechanism just described constitutes the prepayment portion of our invention, and we obtain the power required to operate the delivery mechanism by means of it. It is obvious that by connecting the communicator I in some convenient manner to the unlocking, locking, or delivery portion of sale mechanism its movement can be utilized to deliver many commodities. For instance, if the communicator I was caused by means of a pawl attached to it to give a certain forward movement to a barrel containing cigars or cigarettes those articles could be delivered, by means of a chute, one, two, or more at a time in the well-known manner. The stroke of the communicator could similarly be used to actuate a piston, by which a quantity of liquid or fluid can be delivered, and by varying the stroke the quantity delivered could be regulated as desired. In this application the suction set up during the return stroke could be utilized to refill the cylinder or vessel preparatory to a fresh delivery. There are many similar applications which will be easily understood and carried out by any mechanic conversant with this subject; but we do not now more particularly specify them. Our invention has special application to the delivery of gas, and

in showing how the motion of the communicator I, obtained in the manner hereinbefore fully described, can be utilized to operate delivery mechanism we fully describe and illustrate its application to the purpose of controlling the delivery of gas from a gas-meter.

In adapting the prepayment or operating mechanism to the purpose of controlling the delivery of gas we attach the case containing the said mechanism to a gas-meter in some convenient position—as, for instance, that shown in Fig. 1. We provide a suitable tube J, by which the gas after it has passed through and been measured by the meter can be delivered into the service-pipe, as shown by the arrows in Figs. 3 and 4. If desired, the mechanism may be applied to the inlet-tube, by which the gas is admitted to the meter; but it is more convenient to apply it to the outlet-pipe. A valve-seating K is formed at the orifice through which the gas passes from the meter, on which seat a valve K' rests when the exit is closed. The valve K' is attached to a lever L', fastened on the short rock-shaft L, on the other end of which is a lever L², by means of which a connection is established with the parts controlling the delivery of gas. This part of the mechanism is best shown in the detailed views in Figs. 6 and 7.

In order to prevent the gas coming into contact with the mechanism, the valve-seating and exit-orifice are preferably inclosed within a special chamber M, through one of the walls of which the arbor or spindle L is passed, a stuffing-box M' of ordinary construction being employed to prevent the leakage of gas. The lever L² is coupled by the connecting-rod M² to a bar N, controlled and constructed to alternately open and close the valve, as hereinafter described, said bar being hinged or pivoted at T' to a fixed support.

The communicator I, when employed for the purpose of transmitting the necessary power for actuating the mechanism controlling the delivery of gas, is formed as a rack having teeth I', and is suitably guided, so as to engage constantly with the small spur-pinion I². The pinion I² is affixed to a small disk or crank O, which is loosely mounted upon one end of a threaded shaft P, borne by and rotating in two frames *p p'*. The disk is provided with a pin O', on which a small pawl O² is freely placed, the pawl O² being pressed by means of a spring O³ into gear with the teeth of a ratchet-wheel R, fixed on the end of the shaft P and placed alongside or within the disk O. The shaft P is threaded for the greater part of its length between the frames *p p'* and has necks formed upon it, or is otherwise constructed, so that while having freedom of rotatory motion it has no longitudinal movement, the end-thrust being taken by the bent or star spring P'. Upon the threaded portion of the shaft P a spur gear or pinion Q is placed, having its eye threaded to correspond with and fit on the shaft P. The gear Q is carried in a slide or carriage S in such a

manner that it can rotate freely, but cannot move laterally or lengthwise of the shaft without also moving the slide S in the same direction. The slide S is formed with a slot in its central position, within which the wheel Q is placed, and is guided at each end by guide-rods S' S², the axes of which are parallel to the axis of the shaft P, and which pass through holes of suitable size formed at each end of the slide S. It will be seen that rotation of the shaft P or of the gear Q results in a movement of the slide S along the shaft.

The rotation of the shaft P by the mechanism above described is always in one direction, and when the shaft is rotating the gear is prevented from rotating with it by the elongated pinion presently described. Hence the shaft moves the gear Q and slide S in one direction, this being the direction required to cause the slide to open the valve or cut-off, as hereinafter described. The gear Q is rotated by said elongated pinion after the cessation of the rotation of the shaft, said pinion being rotated by the movement of the gear or other commodity taking place after the opening of the valve or cut-off and rotating the gear on the shaft in the direction required to move the slide in the opposite direction and thus close the valve. The slide is connected with the valve through the slotted bar N, the levers and rock-shaft connecting said bar with the valve and a stud or bar support T, affixed to the carriage and entering the slot in the bar N. The slot N' in the bar N has an angular or irregular form, its upper edge, which bears on the pin or support T, and may therefore be called a "bearing-edge," being composed of the parts 2 and 3, arranged at different angles. When the support T is at the upper end of the portion 2, the valve is closed; but when the support is in contact with any part of the portion 3 the valve is held open, the valve being opened by the movement of the support T along the portion 2 toward the portion 3, and closed by the opposite movement of said support. The movement of the slide S, caused by the rotation of the shaft P, moves the support T in the direction indicated by the arrow in Fig. 6. Hence the support first opens the valve, and then holds it open as long as it remains in contact with the portion 3 of the bearing-edge of the bar N. The said portion 3 is of such length that the movement of the slide and of the support T, caused by one operation of the coin-carrier, will not carry said slide to the end of the portion 3, its length being preferably such that the coin-carrier may be operated several times in succession, each operation (which of course involves the deposit of a coin) moving the support T farther along the portion 3, so that a longer time will be required for the return movement of the support and the closing of the valve thereby than when the support is moved outwardly by but one operation of the coin-carrier, the object being to enable the purchaser to pre-

pay for various quantities of the commodity delivered and to receive the amount paid for before the valve or cut-off is closed.

The mechanism which causes the return or valve-closing movement of the slide S is as follows: U represents the elongated pinion above referred to, said pinion being journaled in fixed bearings and arranged parallel with the shaft P, the length of the pinion being equal to or slightly greater than the excursion made by the gear Q and slide S along the shaft P. The pinion meshes with the gear Q, and when the shaft P is being rotated prevents the rotation of the gear with the shaft, thus insuring the progressive movement of the gear and slide. The pinion U has one of its ends connected by means of suitable gearing, such as the worm-wheel U' and worm U², to some convenient part of the meter, such as the indicator-spindle U³, so that when the latter is rotated by the movement of the gas, which takes place when the valve is opened, a rotary motion is given to the pinion U and by it communicated to the gear Q, said motion causing the gear and slide to move progressively in the opposite direction, and thus move the support T in the direction indicated by the arrow in Fig. 7 and cause the closing of the valve after the support reaches the portion 2 of the bearing-edge.

The operation of the mechanism described for the purpose of controlling the delivery of gas after a coin has been inserted in the slot A' is as follows: The coin A² passes through the slot A' into the slot B⁴ in the coin-carrier and rests upon the eccentric D, as shown in Fig. 9. The coin is thus held in a vertical position, and the mechanism is in position for commencing the operation. The coin-carrier B is rotated by means of the hand-wheel E or handle G², and as the rotary movement is continued the coin A² is moved progressively forward and at the same time is moved outward or protruded beyond the periphery of the carrier to an extent which is regulated by the position of the eccentric D. By adjusting and locking the eccentric D in position by means of the arm D² and screw D³ the coin may be protruded to a greater or less extent, so that the controlling mechanism will cause the delivery of varying volumes of gas or other commodity in accordance with the setting of the eccentric. It will be obvious that the variation which can be obtained will be limited by the throw of the eccentric, and in cases where the variation in the number of cubic feet to be delivered in exchange for the coin greatly exceeds that for which the eccentric has been constructed an eccentric of a different throw or a suitably-shaped cam could be substituted. This would in most cases be the most convenient course; but it is not absolutely necessary, as by duly proportioning the throw of the eccentric a greatly-varying range of action can be obtained, which is sufficient for most purposes. As the

coin A² is moved, as above described, it presses against the lever H and causes said lever to swing to an extent corresponding with the protrusion of the coin A². The movement of the lever H causes the communicator I to make a corresponding movement, and as the rack I' engages with the pinion I² the latter is also rotated. In this way a partial rotation is given to the disk O and the pawl O² is caused to engage with the teeth of the ratchet-wheel R, which is similarly rotated. The wheel R being fixed upon the screw-shaft P, the latter is also rotated within the gear Q. As the gear Q is prevented from rotating with the shaft by the pinion U, the thrust exercised upon the eye of said gear by the thread of the shaft P moves the gear and slide along the shaft in the direction required to open the valve. After the operation of the coin-carrier and the stoppage of the rotation of the shaft P the rotation of the elongated pinion U from the moving parts of the meter, as hereinbefore described, at once rotates the gear Q upon the shaft P and causes the slide S to move backward toward its initial position, which is the one nearest the right-hand frame, as shown in Fig. 7. As the slide S makes the movement last described, the support T travels along the portion 3 of the slot without moving the valve and then moves along the portion 2 and gradually draws the valve K' down upon its seat. There is an important advantage gained by the gradual closing of the valve, because the meter is thereby slowly brought to rest and the diminishing volume of gas passed through the pipe K gives warning to the consumer of the approaching close of the valve.

When it is desired to obtain by means of the apparatus described a larger volume of gas than can be paid for by one coin, without waiting for the consumption of the volume of gas delivered in exchange therefor a number of coins equal in value to the volume of gas desired can be introduced successively and discharged in the manner hereinbefore described, the support T being given an excursion along the portion 3 of a length proportioned to the number of operations of the coin-carrier.

It has hitherto been the practice in some cases to provide for the introduction of a definite maximum number of coins, after the introduction of the last of which the apparatus is locked, so that no more can be paid in until such a volume of gas has been passed through the meter as represents the volume delivered in exchange for one coin. We prefer, instead of locking the apparatus when a certain number of coins has been paid in, to lock it when the parts are in such position as to insure the passage of a predetermined maximum volume of gas before the valve is closed by the return movement of the carriage in the manner hereinbefore described. The movement of the slide S and support T along the bar N is therefore continued in the direction indicated

by the arrow in Fig. 6 so long as the operation of the parts by successive coins is effected, the portion 3 of the bearing-edge being made of sufficient length for this purpose.

5 The slide S is moved by the operation of the first coin in the manner hereinbefore described, so that the support T is moved along the portion 2 of the bearing-edge of the slot N', and the continuation of the movement of

10 the slide S, caused by the operation of the delivery mechanism by every additional coin introduced into the coin-carrier in succession, as previously described, causes the support T to move farther along in the same direction.

15 The result is that the valve K', having been opened by the action of the support T upon the portion 2 of the bearing-edge of the slot N', remains fully open during the whole period in which the support T remains in contact with the portion 3 of the bearing-edge.

20 When the slide S is caused to make its return or backward movement by means of the rotation of the elongated pinion U in the manner hereinbefore described, the valve K' remains open until the support T again reaches the portion 2, when the valve begins to slowly close. We proportion the pitch and size of the various wheels, screws, and other operating parts so that their velocity or the

25 extent of their movement or rotation will cause a definite movement of the slide S and will in this manner so control the volume of gas delivered that the predetermined volume will be passed through the meter in exchange

30 for the coin or coins prepaid in the manner described.

In order to prevent more than a predetermined maximum volume of gas being paid for by a number of coins which are prepared successively without waiting for the slide S to be brought back to its initial position, we utilize the traverse of the slide to oscillate or rock a lever V, one end of which has a slot V³, receiving a pin V⁴, attached to the slide, the

40 other end coming into the path of a hinged stop V' when the slide has reached the limit of its outward or coin-compelled movement. Said stop is pushed into contact with a screw W' on the coin-carrier B and prevents any

45 further movement of the latter. We utilize for this purpose the screw W', it being also employed for the purpose hereinafter described; but it is obvious that a special projection may be formed upon the coin-carrier

50 for the same purpose, or that the hanging stop V' could be dispensed with and the end of the lever V brought directly within the path of the stop. We provide that the end of the lever V shall not operate the stop V' until the required number of coins necessary

55 to prepay the value of the predetermined maximum volume of gas has been paid into the coin-carrier and delivered into the drawer; but we so adjust the lever V that the coin-carrier shall deliver the last coin into the drawer, but cannot afterward complete its revolution, in order to assume a position

to receive another coin. The coin-carrier B, being held by the detent-catch B³, as hereinbefore described, cannot be turned back, and it is not therefore possible to introduce an additional coin until the carriage has been moved backward the required distance during the delivery of the predetermined volume of gas in exchange for one coin.

In order that the consumer may, if he desire it, ascertain the quantity of gas remaining unconsumed of the amount for which payment has been made, we may fix upon the arbor on which the lever V¹ oscillates, or

75 otherwise actuate from the carriage, a small lever or pointer V², the point of which traverses over a graduated scale V³, whereon is indicated the cubic feet of gas which are supplied in exchange for the coins. The indi-

80 cator may or may not be applied, as may be desired.

In order to insure the return of the coin-operated lever H to its initial position, we couple the lever H and the coin-carrier B by

85 means of a light slotted connecting-rod W, held to the carrier B and lever H by screws or pins W' W². In this way the lever H has perfect freedom of movement during its operation by the coin, but is, during the continu-

90 ance of the rotation of the coin-carrier, brought back to its initial or operative position. The return movement of the lever H may, if desired, be obtained or aided by a spring. The return oscillation of the lever H is accompa-

95 nied by a like return movement of the communicator I, and the spur-pinion I² and disk O are also rotated in a contrary direction, the pawl O² being brought back, so as to be ready to re-engage with a tooth in the ratchet-wheel

100 R when the communicator I again makes its forward stroke.

It is obvious that instead of obtaining the upward and downward movement of the valve by means of a slotted bar constructed

105 like that hereinbefore described, the under side of the slot in said bar can be removed, the bearing-edge 23 being the extreme lower edge of the bar. In such case the valve could be arranged to be closed by a spring or weight

110 which would ordinarily exercise a downward pressure on it.

It is obvious that although our invention is shown as applied to a dry meter it is equally applicable to wet meters or to water-meters,

115 or other similar purposes.

We claim—

1. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of an inclosing case

120 adapted to receive a coin, a coin-carrier adapted to rotate in said casing and provided with an operating device whereby it may be rotated, a cam secured in a fixed position within said carrier and formed to impart an

125 outward movement to a coin moved forward by the carrier, and delivery-controlling mechanism operated by the combined movements of the coin, as set forth.

2. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of an inclosing case adapted to receive a coin, a coin-carrier adapted to rotate in said casing and provided with an operating device whereby it may be rotated, a cam secured in a fixed position within said carrier and formed to impart an outward movement to a coin moved forward by the carrier, and means for adjusting said cam to determine the extent of outward movement imparted by it to the coin, as set forth.

3. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of an inclosing case adapted to receive a coin, a coin-carrier adapted to rotate in said casing and provided with an operating device whereby it may be rotated, a cam secured in a fixed position within said carrier and formed to impart an outward movement to a coin moved forward by the carrier, means for adjusting said cam to determine the extent of outward movement imparted by it to the coin, and means for securing said cam in different positions, as set forth.

4. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of an inclosing case adapted to receive a coin, a coin-carrier adapted to rotate in said casing and provided with an operating device whereby it may be rotated, a cam secured in a fixed position within said carrier and formed to impart an outward movement to a coin moved forward by the carrier, and a hub or sleeve affixed to said cam and projecting through the casing and provided at the exterior of the casing with an arm adapted to be locked in different positions to the casing, as set forth.

5. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of an inclosing case having a coin-receiving slot, a rotary coin-carrier within the casing mounted on a shaft extending through the casing and provided with an external operating device, said carrier having a coin-engaging slot or pocket adapted to coincide with the slot in the casing, a fixed cam located within the coin-carrier and formed to move the coin outwardly while it is being moved forward by the rotation of the carrier, and delivery-controlling mechanism, including a lever, arranged to be moved by the combined outward and forward movement of the coin, as set forth.

6. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of a delivery conduit or outlet, a movable valve or cut-off adapted to open and close said outlet, a movable coin-carrier located in a coin-receiving case and adapted to engage and move forward a coin inserted in said case, a coin-displacing device adapted to move the coin outward while it is being moved forward, mechanism operated by the combined movements of the coin to open

the cut-off, and cut-off-closing mechanism operated by the movement of the commodity caused by the opening of the cut-off, as set forth.

7. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of a delivery conduit or outlet, a movable valve or cut-off adapted to open and close said outlet, a hinged bar connected with said cut-off and provided with a bearing-edge comprising two surfaces disposed at different angles, and a support for said edge adapted to be reciprocated rectilinearly, one of said surfaces being parallel with the path of movement of said support, whereby the support when moving in one direction will act on one of said surfaces to open the cut-off and on the other surface to hold the cut-off open and when approaching the end of its movement in the opposite direction will close or permit the closing of the cut-off, as set forth.

8. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of a delivery conduit or outlet, a movable valve or cut-off adapted to open and close said outlet, a hinged bar connected with said cut-off and provided with a bearing-edge comprising two surfaces disposed at different angles, a support for said edge movable rectilinearly, the surfaces of said edge being so arranged that said support when moved in one direction will first open the cut-off and then hold it open and when moved in the opposite direction will at first continue to hold the cut-off open and then close the same, a coin-carrying device and a coin-displacing device co-operating therewith, mechanism operated by the movement imparted to a coin by said devices to give said support its cut-off opening and holding movement, and mechanism operated by the delivery of the commodity to give said support its cut-off-closing movement, as set forth.

9. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of a delivery conduit or outlet, a movable valve or cut-off adapted to open and close said outlet, a hinged bar connected with said cut-off and provided with a bearing-edge comprising two surfaces disposed at different angles, a slide movable on fixed guides in a rectilinear direction and provided with a projection constituting a support for said bearing-edge, the latter being formed so that the movement of said support in one direction along the bearing-edge first opens the cut-off and then holds it open, while the return movement of the support at first continues to hold the cut-off open and finally closes it, a screw-shaft journaled in bearings which prevent endwise movement of said shaft, a gear-wheel having a threaded eye engaged with said shaft and adapted to be moved laterally by the rotation thereof, said wheel being engaged with the slide so as to impart lateral movement thereto, an elongated pin-

ion journaled in fixed bearings and extending the entire length of the path in which the gear is moved by the screw-shaft, means for rotating the screw-shaft in the direction required to give the bar-support its cut-off-opening movement, said means comprising coin-carrying and displacing devices and mechanism operated by a coin moved by said devices to rotate the screw-shaft, and mechanism impelled by the movement of the sold commodity caused by the opening of the cut-off, whereby the elongated pinion and the laterally-movable gear meshing therewith are rotated after the cessation of the rotation of the screw-shaft, the rotation of said gear upon the screw-shaft causing the gear to move laterally in the direction required to give the bar-support its cut-off-closing movement, as set forth.

10. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of a conduit or outlet for the commodity to be delivered, a valve or cut-off adapted to open and close said outlet, an arm attached to said cut-off, a rock-shaft journaled in a fixed bearing and affixed to said arm, another arm affixed to said rock-shaft, a bar having an angular slot and hinged at one end to a fixed support, its other end being connected to the arm last mentioned, and a reciprocating stud or support entering said slot and having a rectilinear movement therein, said slot having one portion parallel with the guides for the said stud when the valve is open, whereby the stud or support in moving in one direction first moves the bar into position to open the cut-off through the described connections and then holds the cut-off open and in moving in the opposite direction at first continues to hold the cut-off open and finally moves the bar to its cut-off-closing position, as set forth.

11. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of a screw-shaft journaled in bearings in which it has no end motion, a coin-carrier and a coin-displacing device adapted to give motion to a coin inserted in the apparatus, coin-impelled mechanism for rotating said shaft, a gear having a threaded eye engaged with said shaft and moved laterally along the shaft by the rotation thereof, a slide engaged with said gear and moved by the lateral movements of the latter, an elongated pinion meshing with said gear and serving to prevent the gear from rotating with the screw-shaft, a gas-meter having an opening adjacent to said slide, a valve controlling said outlet, connections between the carriage and valve whereby the carriage, when moved by the rotation of the shaft, is caused to open the valve, a shaft adapted to be rotated by the movement of gas through the meter, and connections between said shaft and the elongated pinion whereby the pinion is rotated by the moving gas and caused to rotate the gear and thus move the carriage in

the direction required to close the valve, as set forth.

12. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of an inclosing case having a coin-receiving slot, a coin-carrier within the casing mounted on a shaft extending through the casing and provided with an external operating device, said carrier having a coin-engaging slot or pocket adapted to coincide with the slot in the casing, a fixed cam located within the coin-carrier and formed to move the coin outwardly while it is being moved forward by the rotation of the carrier, a lever arranged to be moved by the combined outward and forward movements of the carrier, a rack-bar or communicator connected with said lever, a shaft journaled in fixed bearings and provided with a screw-threaded periphery, a pinion mounted loosely on said shaft and meshing with said rack, a disk or enlargement affixed to said pinion and provided with a pawl, a ratchet affixed to said shaft and engaged with said pawl, a gear having a threaded eye engaged with the thread of said shaft, a slide engaged with said gear, a commodity outlet or conduit, a cut-off or valve therefor, connections between said slide and cut-off whereby the latter is opened by the movement imparted to the slide by the independent rotation of the shaft in the gear and closed by the movement imparted to the slide by the independent rotation of the gear on the shaft, an elongated pinion journaled in fixed bearings and meshing with said gear, and a shaft adapted to be rotated by the movement of the sold commodity and geared to said pinion, said shaft and pinion rotating the gear upon the threaded shaft after the cessation of the rotation of the latter, as set forth.

13. The combination of the rotary coin-carrier, a fixed coin-displacing device therein, a screw-threaded shaft, mechanism operated by said carrier and displacing device and a coin moved thereby to rotate said shaft, a conduit or outlet for the commodity sold, a cut-off or valve for said outlet, a slide moved in one direction by the rotation of said shaft, connections between the slide and valve, whereby the valve is opened by the said movement of the slide, and a movable stop arranged to be moved by the slide when the latter reaches a given point in its motion, said stop being moved by the slide into position to lock the coin-carrier and prevent further movement thereof, as set forth.

14. The combination of the rotary coin-carrier, a fixed coin-displacing device therein, a screw-threaded shaft, mechanism operated by said carrier and displacing device and a coin moved thereby to rotate said shaft, a conduit or outlet for the commodity sold, a cut-off or valve for said outlet, a slide moved in one direction by the rotation of said shaft, connections between the slide and valve, whereby

the valve is opened by the said movement of the slide, mechanism operated by the delivery movement of the sold commodity to move said slide in the opposite direction and thereby close the valve upon the delivery of the prepaid commodity, and an indicator operated by the movements of the slide and indicating the undelivered quantity of the prepaid commodity, as set forth.

10 15. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of the coin-carrier, the coin-displacing device, a lever arranged to be moved in one direction by the combined
15 movements given to a coin by said parts, delivery mechanism operated by said lever, and mechanism positively acting upon said lever for moving it in the opposite direction to reset it and the mechanism operated by it after
20 the operation of the coin moved by the carrier has ceased, as set forth.

16. In a coin-controlled apparatus of substantially the character described hereinbefore, the combination of the coin-carrier, the
25 coin-displacing device, a lever arranged to be moved in one direction by the combined movements given to a coin by said parts, delivery mechanism operated by said lever, and a slotted rod connecting the coin-carrier with the
30 lever, said rod permitting the movement of

the lever by the coin and enabling the carrier to reset the lever and accompanying mechanism after the discharge of the coin from the carrier, as set forth.

17. In a coin-controlled apparatus of substantially the character hereinbefore described, the combination of a case having a coin-receiving slot and a coin-receptacle below said slot, a coin-carrier located between said slot and receptacle and adapted to receive
40 a coin from said slot to be rotated by the operator and thereby move the coin progressively toward the receptacle, a coin-displacing device within said carrier, whereby the coin is positively moved outwardly during its progressive movement by the carrier, and a delivery-mechanism-operating lever arranged to be actuated by the positive movement of the coin, said carrier being arranged to deposit
45 the coin in the receptacle after it has moved said lever, as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 17th day of August, A. D. 1891.

JAMES FEATHAM SAWER.
JAMES LYON PURVES.

Witnesses:

JOSEPH NASMITH,
JOSEPH HOWARTH.