

D. ORME.
COIN CONTROLLED GAS METER.

No. 540,402.

Patented June 4, 1895.

FIG. 1.

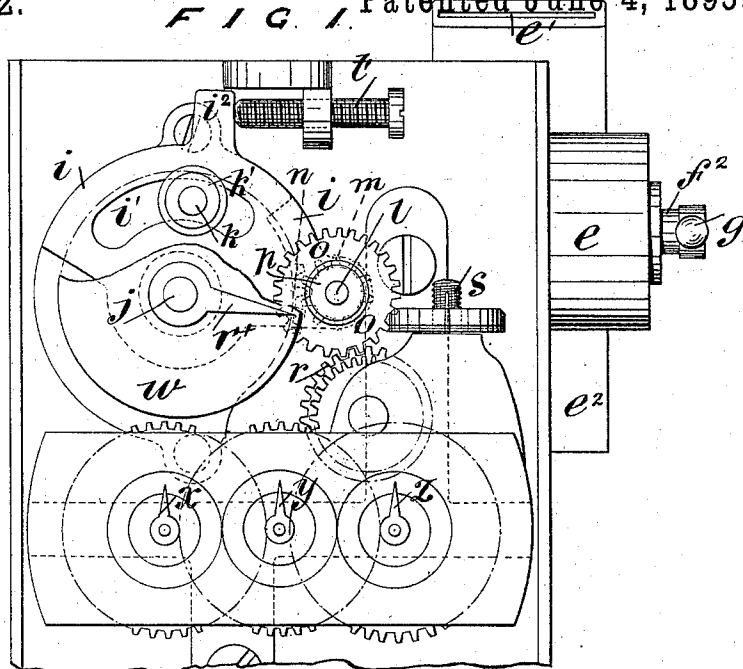


FIG. 3.

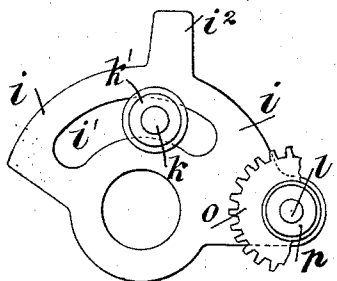


FIG. 4.

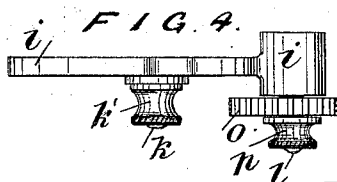
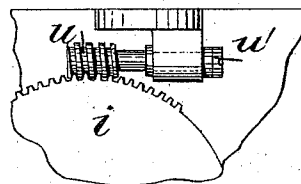
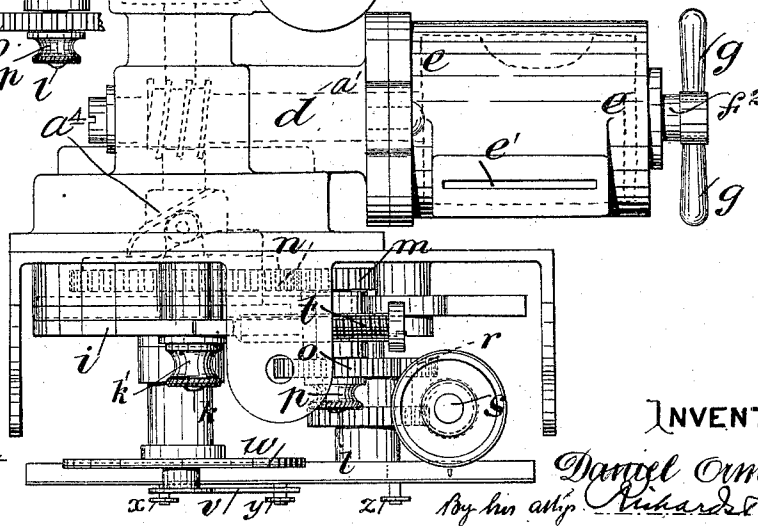


FIG. 2.



Witnesses
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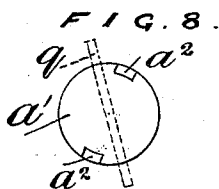
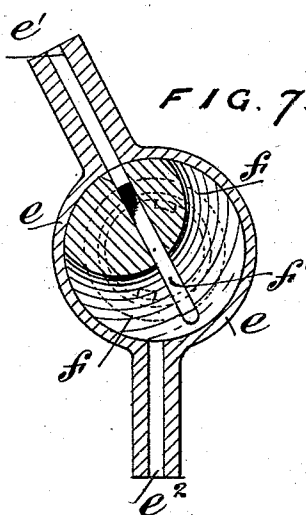
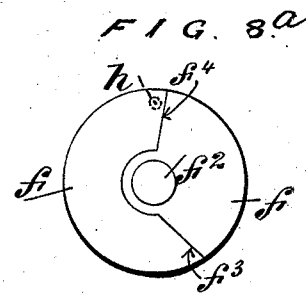
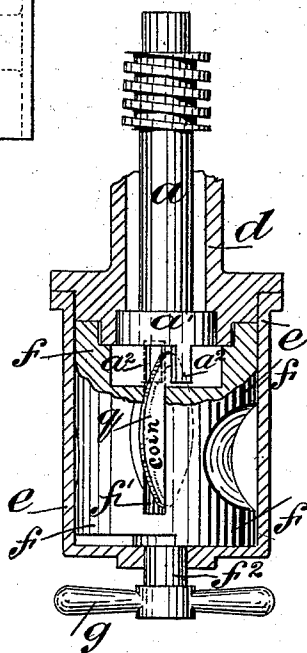
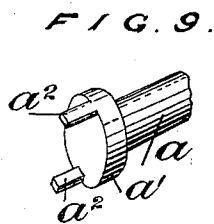
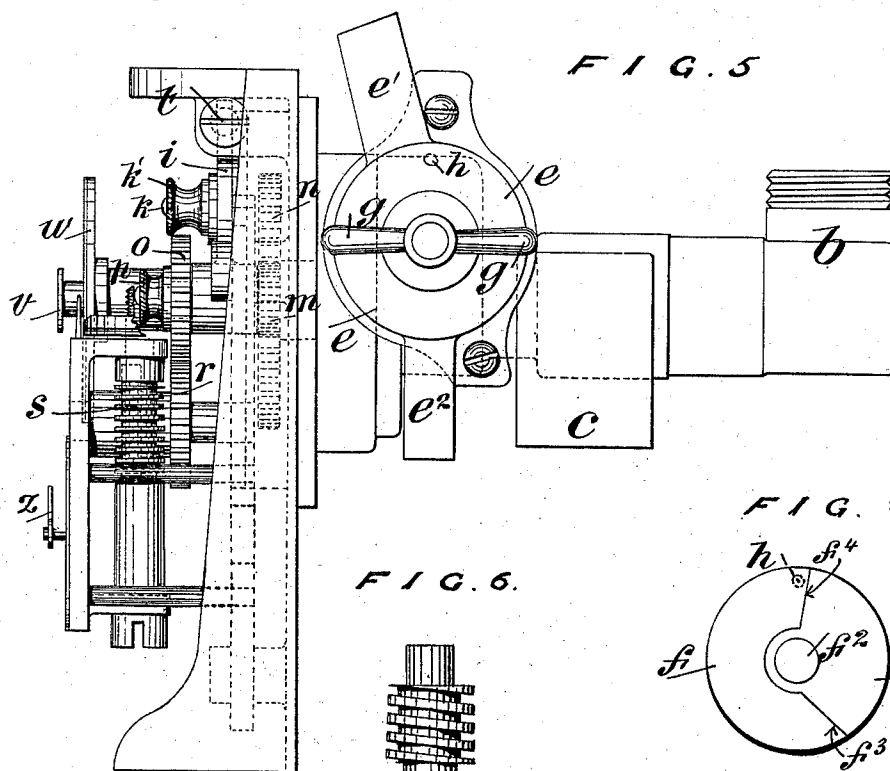
INVENTOR

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COIN CONTROLLED GAS METER.

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UNITED STATES PATENT OFFICE.

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COIN-CONTROLLED GAS-METER.

SPECIFICATION forming part of Letters Patent No. 540,402, dated June 4, 1895.

Application filed November 16, 1894. Serial No. 529,004. (No model.) Patented in England August 27, 1894, No. 16,281.

To all whom it may concern:

Be it known that I, DANIEL ORME, a subject of the Queen of Great Britain and Ireland, residing at Oldham, Lancaster county, England, have invented a new and useful Improvement in Prepaid Gas-Meters, of which the following is a specification.

A patent for this invention has been granted in England, No. 16,281, dated August 27, 1894.

The present invention relates to prepayment gas meters through which a pre-determined quantity of gas is allowed to pass to the consumer on the insertion into a coin receiver of a coin or token representing the value of the required quantity of gas. The improvements may be used generally in connection with wet or dry gas meters of this type, but I will describe the invention as more particularly applicable in conjunction with an invention for which I have already obtained a patent in the United States, No. 497,682, of 1893. In this patent I have described coin receivers with which I combined means for increasing or diminishing the quantity of gas delivered in accordance with the market or local price of gas.

The chief points of my present invention are the employment of a coin receiver of greatly simplified construction and working; and the transference of the means for increasing or diminishing the quantity of gas to be delivered, from the coin receiver to gearing or parts not forming part of the said coin receiver, and thereby rendering more difficult or impossible the fraudulent manipulation of the meter.

The improvements will be more easily explained and understood by proceeding at once to a consideration of the annexed two sheets of drawings.

On Sheet 1, Figure 1 is a front view of the dials and mechanism of a prepayment meter fitted with my improved coin-receiver and means for varying the quantity of gas delivered. Fig. 2 is a plan of Fig. 1. Fig. 3 is a side view of the adjustable quadrant which carries the change-wheel, which varies the quantity of gas delivered. Fig. 4 is a plan of Fig. 3. Fig. 4^a illustrates a modified mode of adjusting and setting the quadrant. On Sheet 2, Fig. 5 is a side elevation of the apparatus at right angles to Fig. 1. Fig. 6 is a

plan view, partly in section, of the coin-receiver. Fig. 7 is a vertical section of the coin-receiver. Fig. 8 is a front view of the driven end of the worm-spindle, which is operated by turning the coin-receiver. Fig. 8^a is an end view of the coin-receiving cylinder, and Fig. 9 is a perspective view of Fig. 8.

It will be understood that the worm of the spindle *a* gears with a worm wheel on a spindle *a''* which carries a valve *a'''*, the said valve governing the admission of gas at the entrance *b*, the admitted gas flowing to the consumer through the exit *c*. The valve spindle opens and closes the valve by means of a cam, *a⁴*, dotted lines, Fig. 2.

The present improvements relate in the first place to the coin receiver and this I will now describe.

A branch *d* projects from the casing containing the valve spindle and valve, and this branch *d* contains the worm spindle *a*. The outer end of the spindle *a* terminates in a disk *a'* (see Figs. 6, 8 and 9) and the disk carries two driving projections *a²*. Upon the end of the branch *d* I fit a hollow cylindrical casing *e* which contains a revoluble cylindrical body *f* formed with a coin receiving slot *f'*. A short spindle *f²* projects from the cylinder *f* through the outer end of the casing *e* and is furnished with a handle *g* whereby the cylinder may be turned. The cylinder *f* is recessed at its inner end as clearly shown in Fig. 6 to admit the projections *a²*. The cylinder is also cut out midway as clearly appears in Figs. 6 and 7, and at the outer end it has a set off so as to present two shoulders *f³ f⁴* which are intended to limit the revolution of the cylinder *f* by coming into contact with a stop pin *h* the position of which is indicated in dotted lines in Fig. 8^a and also at the end of the casing *e* in Fig. 5 this pin *h* being screwed through the end of the casing.

The coin receiving slot *f'* goes entirely through the cylinder *f* and is wide enough at the top to receive a coin of the proper size and value. At the foot the slot is contracted so that the coin shall not drop through the cylinder, but will remain therein until the cylinder is turned. On the other hand if a smaller coin of less value should be inserted, the slot is wide enough at the foot to let it drop entirely through into the coin recepta-

cle as soon as the cylinder is moved, without affecting the apparatus at all.

It will be seen that the casing *e* has a slot *e'* into which a coin of the proper size and value marked *q* in Fig. 6 is placed. It drops down into the slot in the cylinder *f* and rests upon the contracted edges of the slot beneath. In this position the projecting edge of the coin on one side has entered between the projections *a*² from the disk *a'*. The cylinder *f* may now be turned by means of the handle *g* and the edge of the coin as it is carried round by the cylinder engages with the projections *a*² and acting like a screw driver, turns the disk *a'* and the spindle *a*. This has the effect of turning and advancing the cam and opening the gas admission valve. When the cylinder *f* has been turned round rather more than half a revolution, the wide end of the slot *f'* and the coin come opposite to the delivery slot *e*² in the casing leading to the coin receptacle, and the coin drops through the slot. At the same time the shoulder *f*³ comes against the stop *h* and further rotation of the cylinder is arrested. The cylinder is now turned back, the spindle *a* remaining in the position into which it has been turned, and the projections *a*² having been left in a position which enables the next coin inserted to slip between them. In turning the cylinder *f* back, the shoulder *f*⁴ comes against the stop *h* and arrests the cylinder in a position which brings the slot *f'* exactly in line with the slot *e'*, ready to receive another coin. As the cylinder *f* fits the casing *e* closely for a portion of its circumference, it is impossible for a fraudulent consumer to recover the coin by attaching it to a piece of cord or flexible wire. Further a smaller coin of less value than the appointed coin would also fail to actuate the mechanism, as before it could operate the spindle *a*, it would drop through the contracted end of the slot into the coin receptacle.

In my former patent I combined means with the coin receiver for varying the quantity of gas to be delivered in accordance with the market or local price of gas. In the present apparatus I isolate such varying means from the coin receiver and obtain the same result by using change wheels in the body of the apparatus. The applied change wheel gears with the usual mechanism of the meter, receiving motion from the upright shaft or other means whereby the valve spindle is rotated or moved to and fro. By using a change wheel having more or fewer teeth, the change wheel and consequently the bowl which operates the cam and valve spindle are moved at a determinable rate of speed, and more or less gas is delivered to the consumer.

Referring now to Fig. 1 of the drawings I mount an adjustable quadrant *i* loosely upon a sleeve on the outer end of the valve spindle *j*. The quadrant *i* which is shown separately in Figs. 3 and 4 has a curved slot *v'* through which a fixed screwed stud *k* projects from the frame behind. A milled nut *k'* screws on

the end of the stud and is used to jam the quadrant *i* in any position. One side of the quadrant *i* has a boss carrying a short spindle *l*. The inner end of this spindle is furnished with a toothed pinion *m* which gears with a similarly toothed spur wheel *n* mounted on the axis of the cam and operating by means of a bowl carried on a bracket, to move the valve spindle to and fro as already described in my aforesaid United States patent of 1894. The pinion *m* and spur wheel *n* appear in dotted lines in Fig. 1 and also in Figs. 2 and 5.

On the other end of the short spindle *l* I place a change wheel *o* which can easily be removed and replaced by a change wheel having a greater or less number of teeth. The end of the spindle *l* is screwed and the change wheel *o* is secured on the spindle by the milled nut *p*. The change wheel *o* gears with and is driven by the pinion *r* which is part of the gearing of the meter receiving motion from the upright shaft *s* or other driving means from the bellows or measuring cylinder of the meter.

As the change wheel *o* is thus the medium of communication between the mechanism of the meter and the means for opening and closing the gas supply valve at *b* it will be evident that by increasing or diminishing the number of teeth in the change wheel *o* the period between the opening and closing of the supply valve may be lengthened or shortened at pleasure and so as to give a greater or less quantity of gas in exchange for the inserted coin. For example referring to Fig. 1 suppose that the coin inserted in the coin receiver is the equivalent in market value of twenty-five feet of gas, it will be noted that the number of teeth in the wheel *o* is twenty-five, each tooth in this case representing a foot of gas. Should the market price of gas fall, so as to render the coin, value for thirty feet of gas for example, then the wheel of twenty-five teeth would be replaced by a wheel having thirty teeth. In the same manner if the market price of gas were to rise, so that the inserted coin has a purchasing power of twenty feet only, the change wheel *o* would contain twenty teeth.

Lest the jam nut *k'* should not be sufficiently secure to keep the wheels *o* and *r* in their proper relative driving position I provide an abutment *i*² on the quadrant *i*, a set screw *t* being provided to adjust exactly the depth to which the teeth of the wheels *o*, *r* shall engage. As the quadrant *i* is pivoted on the same axial center as the spur wheel *n* it will be evident that any adjustment of the quadrant will not affect the gearing of the pinion *m* with the wheel *n* seeing that the pinion *m* is carried by the quadrant. As modified means for adjusting and setting the quadrant I might form worm teeth on the periphery of the quadrant *i* as shown in Fig. 4^a and provide a worm *u* on a spindle *u'* which worm would engage with the worm toothed periphery, so that by turning the spindle *u'*

I could correspondingly turn and adjust the quadrant.

The rest of the mechanism shown in the drawings is not material to my invention and I need not therefore describe it in detail.

The pointer r^x is mounted on the valve spindle and is turned by the action of the coin receiving mechanism to indicate on the dial w the quantity of gas which has been paid for. The three remaining pointers x, y, z in front of their respective dials are the usual indicating pointers and need not further be referred to.

The cutaway part of the cylinder about the reduced end of the slot serves a useful purpose, as by this the coin, if introduced before the cylinder is turned back with the inlet end of its slot in line with the coin chute, will be prevented from entering the wrong end of the slot, *i. e.*, the discharge end, which would lock the cylinder and prevent the operation of the machine. The coin with the improved cylinder simply engages the edge of the cut-away part and thus it will be held up out of engagement with the slot.

I claim as my invention—

1. In pre-payment gas meters, a coin receiver, consisting of a cylinder f formed as described, contained within a casing e formed with coin inlet and outlet slots, the cylinder f having a coin slot extending entirely through it from side to side wide at the top to admit freely a coin of the proper size, and sufficiently narrow at the foot to retain the said proper coin until the cylinder is turned half round but at the same time wide enough to permit a coin of a smaller size to pass there-through and so as not to operate the mechanism, in combination with the fingers a^2 projecting from, or from a disk or part on, the end of the worm spindle a , the whole arranged and operating said fingers lying normally on opposite sides of the coin slot to engage different sides of the same coin substantially as hereinbefore described and shown.

2. In a coin freed apparatus, the coin freed

mechanism and the coin cylinder arranged to receive the coin, said cylinder having a slot through it for the coin and having a cut away part about the slot to prevent the coin from entering the slot from that side, substantially as described.

3. In combination in a coin freed apparatus the coin freed mechanism and the coin cylinder having a slot through it with a reduced portion and having a cut away part about the reduced portion of the slot, substantially as described.

4. In combination, in a prepayment gas meter, the meter mechanism, the supply valve and the intermediate transmitting mechanism between the said meter mechanism and the supply valve comprising the removable change wheel o and the adjustable support for said wheel, consisting of the rack quadrant with the worm for operating and holding the same substantially as described.

5. In combination, in a prepayment gas meter, the meter mechanism, the supply valve and the intermediate transmitting mechanism comprising the removable change speed wheel o , the wheel n and the wheel m between the wheels o and n said wheels o and m being carried by an adjustable support arranged to be moved concentric with the wheel n , substantially as described.

6. In combination in a prepayment gas meter, the meter mechanism, the valve and the intermediate transmitting mechanism comprising the removable change wheel o , the wheel n , the wheel m between o and n and the adjustable support for the wheels o and m comprising the disk arranged to be adjusted about the axis of the wheel n substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

DANIEL ORME.

Witnesses:

DAVID FULTON,
JOSHUA ENTWISLE.