(No Model.)

4 Sheets—Sheet 1.

W. N. MILSTED.

PREPAYMENT GAS METER.

No. 526,251. Patented Sept. 18, 1894.

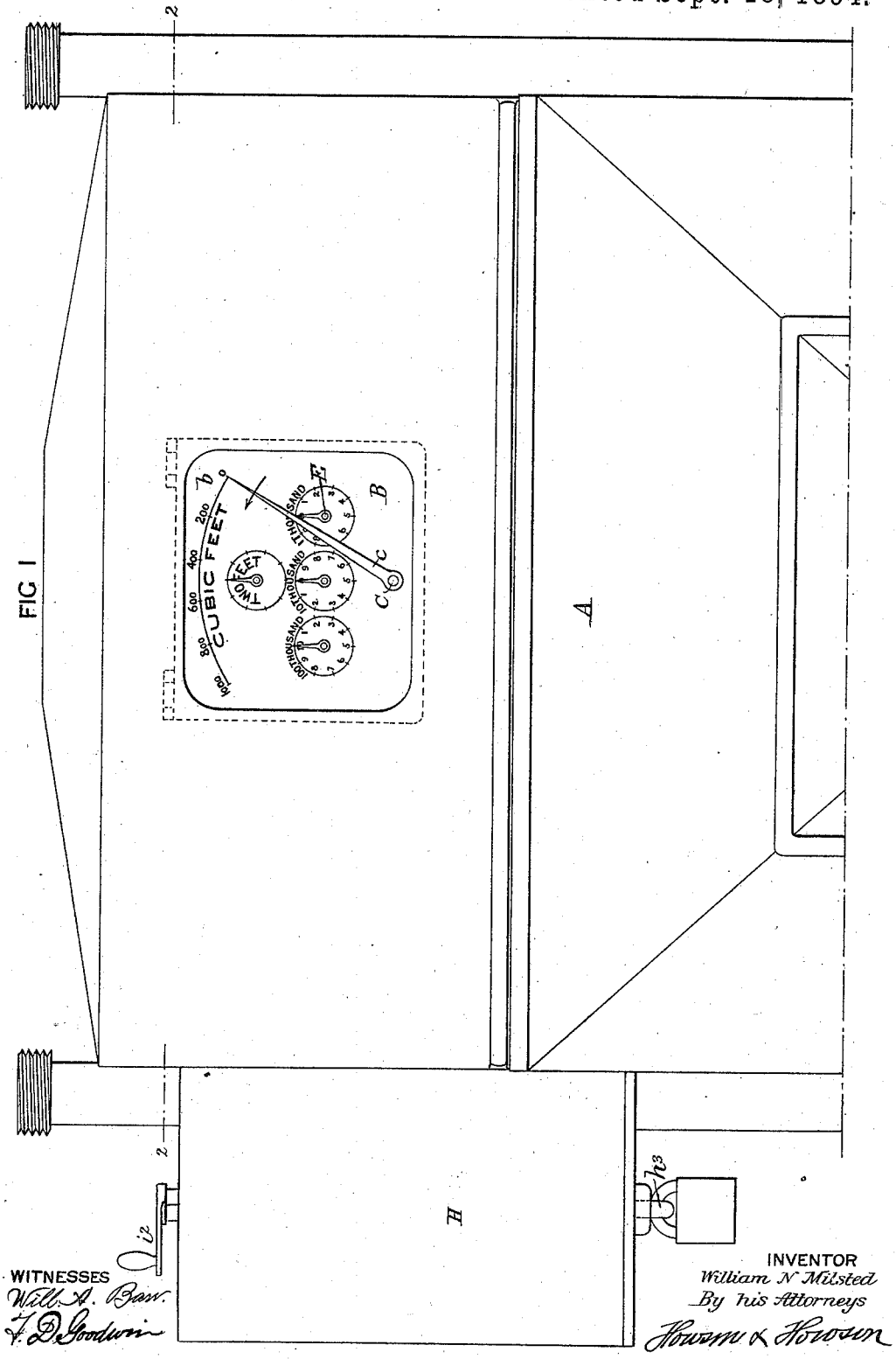

FIG 1

WITNESSES

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(No Model.)

4 Sheets—Sheet 2.

W. N. MILSTED.

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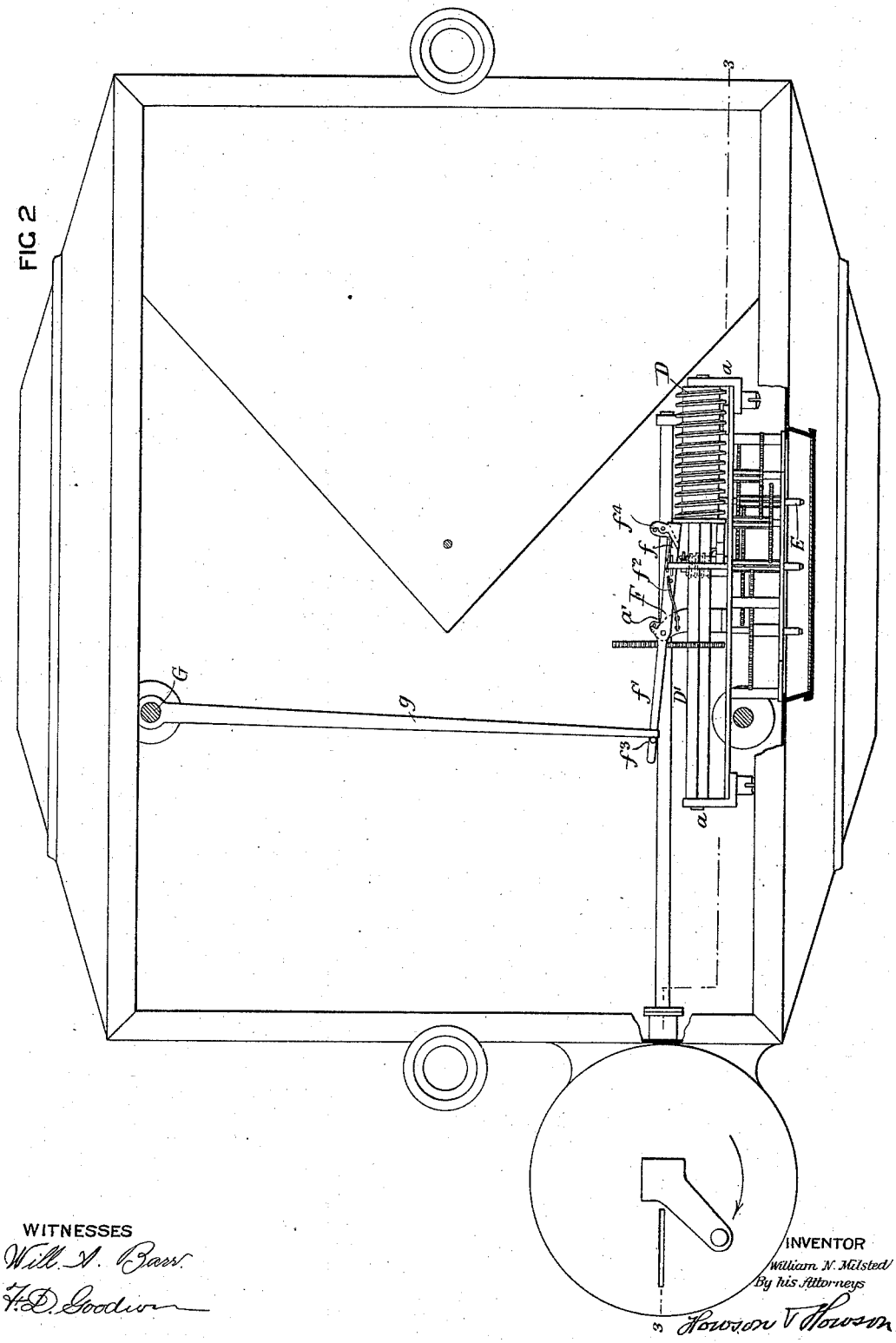
FIG 2



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(No Model.)

4 Sheets—Sheet 3.

W. N. MILSTED.

PREPAYMENT GAS METER.

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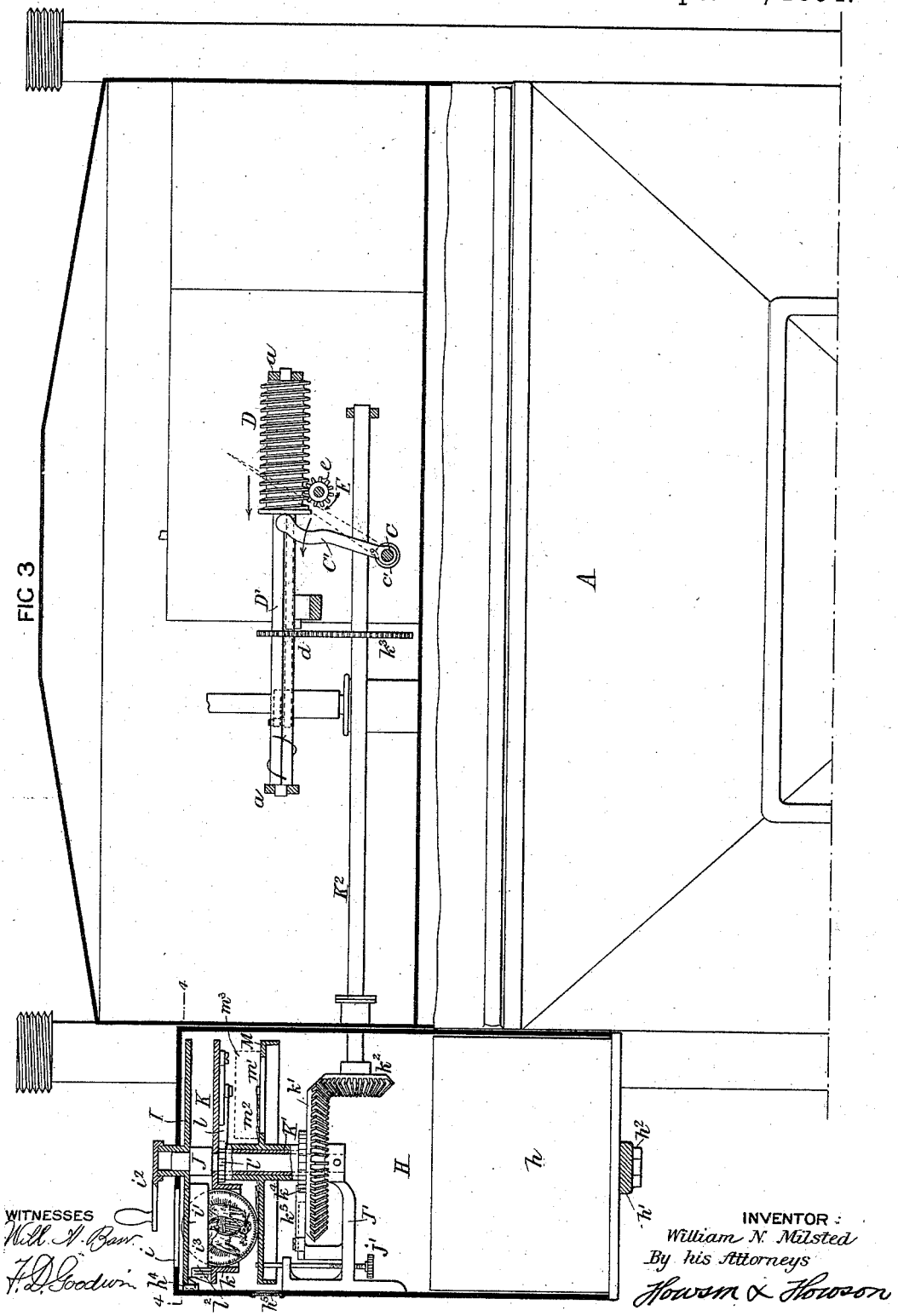
FIG 3



(No Model.)

4 Sheets—Sheet 4.

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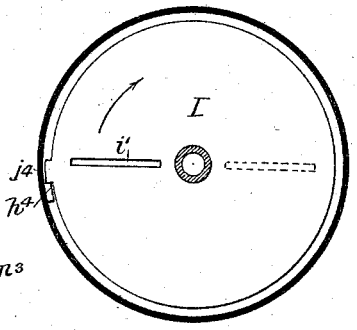
PREPAYMENT GAS METER.

No. 526,251. Patented Sept. 18, 1894.

FIG 4



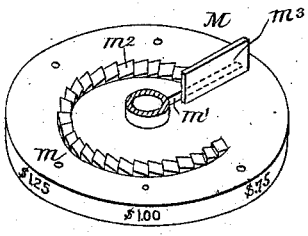


FIG 5

FIG 6

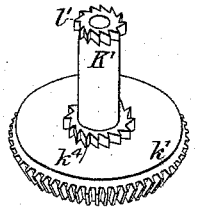


FIG 8

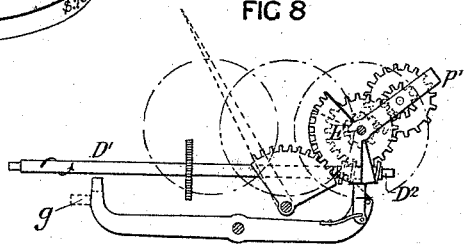


FIG 7

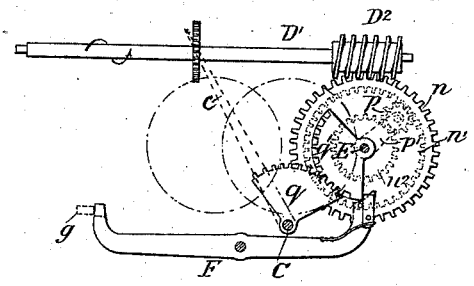
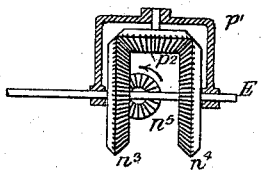


FIG 9



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM N. MILSTED, OF NEW YORK, N. Y.

PREPAYMENT GAS-METER.

SPECIFICATION forming part of Letters Patent No. 526,251, dated September 18, 1894.

Application filed April 30, 1894. Serial No. 509,504. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. MILSTED, a citizen of the United States, and a resident of New York city, New York, have invented certain Improvements in Prepayment Gas-Meters, of which the following is a specification.

My invention relates to certain improvements in gas meters in which automatic vending mechanism is used, so that a user of gas may purchase a certain amount of gas by simply placing a coin in a receiver, which is so connected to the meter as to allow a certain number of feet of gas to be used for a given amount. For instance in the mechanism which I will proceed to describe, the apparatus is arranged to receive silver quarter dollars, and the apparatus is so connected to the meter mechanism that, for instance, if the gas is selling at one dollar and twenty-five cents a thousand feet, the mechanism would be so timed that upon the insertion of the quarter dollar, two hundred feet of gas could be used before the mechanism of the meter would be stopped, and the meter shown in the drawings is so arranged that five quarters can be fed into the apparatus, so that one dollar and twenty-five cents' worth of gas, or one thousand feet, can be paid for at one time. By this means a person can pay for gas in small installments, rather than wait until the sum accumulates, and more care will be taken in using gas.

In the accompanying drawings:—Figure 1, is a front view of sufficient of a meter illustrating my invention. Fig. 2, is a sectional plan on the line 2—2, Fig. 1. Fig. 3, is a sectional elevation on the line 3—3, Fig. 2. Fig. 4, is a section on the line 4—4, Fig. 3. Figs. 5 and 6, are perspective views of details of the invention; and Figs. 7, 8 and 9, are views of modifications of portions of the apparatus.

A is the meter casing of the usual construction, having a dial plate B on which are the dials for the feet, indicating the measurement by thousands, tens of thousands and by hundreds of thousands. I also provide an extra dial *b*, showing the number of cubic feet paid for and not used by the purchaser. The hand *c* on a shaft C, indicates the number of feet not used.

While I have shown in the drawings the dial *b* as extending only to one thousand feet, it may be differently arranged, and include more or less than one thousand feet. The shaft C has at its opposite end, within the meter casing, an arm C′ bearing against a sliding worm D adapted to a squared or other polygonal sectioned or splined shaft D′ mounted in bearings *a a* on the index plate. This worm gears with a pinion *e* on the shaft E of the indicator of the one thousand feet dial, as shown in Fig. 1. The shaft D′ is turned by a coin controlled mechanism, so that when a quarter dollar is placed in position and the coin controlled mechanism turned, it will turn the shaft D′, and as this shaft turns the worm D will be fed forward, the pinion *e* acting as a fixed nut for the worm.

It will be understood that I may, by introducing suitable wheels between the shaft K^2 and shaft D′, turn the latter in the reverse direction when necessary, without departing from my invention.

As the worm is fed forward on the shaft, in the direction of the arrow Fig. 3, it will also move the arm C′ in the direction of the arrow, and this arm being adapted to the shaft C, will move the hand *c* in the direction of its arrow to the two hundred point, and as the gas is used, the shaft E of the indicator mechanism will move in the direction of the arrow and push the worm D on the shaft back to its normal position, and the arm C′ on the shaft C will follow, as a spring *c′* tends to keep the arm always against the end of the worm D.

In order to arrest the operation of the meter when the worm has reached the limit of its rearward movement, I pivot an arm F on a bracket *a′* projecting from the index plate and one end *f* of this arm has a tendency to fall in front of the worm D, a spring f^2 bearing against a pin on the arm, as shown in Fig. 2, while the other arm *f′* extends into the path of an arm *g* of the flag rod G, a lug f^3 on the arm *f′* checking the movement of the arm *g*, and consequently checking the movement of the flag rod, which carries one of the heads of the bellows of the meter. Thus the bellows cannot move their full distance, and the valve mechanism controlled by the

flag rod cannot throw its full distance and consequently the meter will stop measuring and the supply of gas will be cut off.

A spring pawl f^4 pivoted to the arm f of the lever F, will yield when the shaft D′ is turned by the insertion of a coin, so that the arm f of the lever F will be pushed out by the worm D, and the arm f' of the lever moved clear of the arm g of the flag wire, allowing the meter to measure a certain quantity of gas.

The coin operating mechanism I prefer to use, is clearly shown in Fig. 3, and consists of a box H, secured to one side of the meter, and in the bottom of this box is a money receptacle h confined to the box by a bar h', which is pivoted at h^2, and through which passes the staple h^3 secured to the body of the box. A lock can be readily applied to this staple.

Other means of fastening the money receptacle within the box may be used without departing from my invention.

In the upper part of the box is a coin slot i, and directly under the top of the box is a disk I, having a coin slot i', and provided with a handle i^2, by which it is turned. This disk is mounted on a vertical stud J secured to a bracket J′, which is attached to the side of the box H. When a coin is inserted in the slot in the disk I, the disk must be moved in the direction of the arrow to the discharge point to register, and then must be returned in the reverse direction. It cannot be turned a full turn in the direction indicated, as it will be stopped by a projection h^4 on the casing, striking a projection i^4 on the disk.

Directly under the disk I is a disk K, having a coin slot k, which must align with the coin slot i' in the disk I, and with the coin slot i in the casing before a coin can be inserted, and when a coin is inserted as shown in Fig. 3, the coin itself locks the disk I to the disk K, and they both travel forward together to the point of discharge, which in the present instance, is in the opposite side of the casing, as shown by dotted lines in Fig. 4, and full lines in Fig. 3. This disk K is fixed to the hollow shaft K′, to which is attached the bevel gear wheel k' which meshes with a bevel gear wheel k^2 on the shaft K^2 extending into the meter, and this shaft K^2 has a gear wheel k^3, which meshes with a wheel d on the shaft D′, so that when the disk K is turned the shaft D′ is also turned to an extent dependent upon the manner in which the disk is geared to the shaft, so that the worm will be fed forward the required distance.

The hub of the wheel k' has a ratchet k^4, to which is adapted a spring pawl k^5 pivoted to the frame J′. This pawl prevents the wheel k' returning with the disk K. The disk K is connected to the hollow shaft K′, through the pawl l carried by the disk, and ratchet l' carried by the shaft, so that while the shaft K′ must travel forward with the disk, K, it will be held from returning by the pawl k^5 and the pawl l on the disk will pass freely over its ratchet. The depending portion i^3 on the disk I on its return movement, strikes against the projection l^2 on the disk K, so that the disk K will be returned with the disk I, and both will be stopped in proper position directly under the slot i in the case, by the stop h^4, as shown in Fig. 4.

M is a plate mounted on the shaft K′, and fixed to the casing by a pin j' tapped into the bracket J′ and extending into one of the holes m in the plate, as shown in Fig. 5. This plate has a coin slot m' and a lug m^3 adapted to stop the rotation of the disk K a lug on the disk coming in contact with the lug m^3, when the disks I and K are turned, so that their coin slots will align with the coin slot in the plate and the lug and coin carrier meet, the coin will be released from the disks I and K, and fall into the receptacle through the coin slot m'. On the upper face of this plate M are ratchet teeth m^2 with which the lower edge of the coin engages, so that as it is fed forward, it passes over these ratchet teeth, but cannot return owing to the teeth, so that a user could not turn the apparatus backward and forward. The plate M can be adjusted by setting the pin j' in any one of the different holes, according to the price of gas. If the plate is now set for gas at one dollar and twenty-five cents a thousand feet, and if the gas is less than one dollar and twenty-five cents a thousand feet, the plate is turned so that the distance between the coin slot i and the coin slot m' will be greater, but if it is more than one dollar a thousand feet, the plate will be moved so as to shorten the distance between the two coin slots.

On the edge of the plate M, as shown in Fig. 5, are a series of numbers, indicating the price of the gas at that point, and in the casing H is a sight hole h^5, closed with glass or it may simply have a cover, or may be covered in any suitable manner. This will indicate to what point the plate M is set.

In Fig. 7, I have shown a modification of the mechanism within the meter, dispensing with the traveling worm or screw, and substituting therefor a fixed worm D^2 on the shaft D′, which engages with a worm wheel n having an internal gear n' engaging with a pinion p on an arm p' loose in the shaft E. This pinion in turn gears with a toothed wheel n^2 fast to the shaft E. The shaft C carrying the hand c is geared to the sleeve of the arm p' by segments q q', so that when the shaft D′ is driven, the arm p' will be driven in one direction by the gears n n' and p, but when the meter is working, the arm p' is moved in the opposite direction through the gears n^2 and p, the teeth n' acting as a fixed rack.

The pivoted lever F is actuated by an independent segment attached to the arm p'.

In Fig. 8, I have shown a modification of this gearing, in which the arm p' carries two gears secured together, one less in diameter

than the other, and the larger gear meshing with a smaller gear on the shaft E, while the small gear meshes with a larger gear wheel which is driven by a worm D^2 on the shaft D'.

In Fig. 9, I have shown the same arrangement, using bevel gears, the arm p' carrying the bevel gear wheel p^2, and this bevel gear wheel meshes with the wheels n^3 and n^4, the wheel n^3 being driven from the shaft D' through the bevel pinion n^5, and the bevel wheel n^4 being driven by the shaft E.

I claim as my invention—

1. The combination of the coin receptacle, the disk therein adapted to be rotated on the insertion of a coin, a shaft extending from the coin receptacle into the meter and driven by the disk, a shaft D' geared to said driven shaft, supply controlling gearing geared to said shaft so as to feed forward when a coin is inserted, registering mechanism also geared to said supply controlling gearing and adapted to drive it in the reverse direction, with a stop arm controlling the movement of the flag wire, and controlled by the supply controlling gearing, so that when the supply of gas paid for is exhausted, the arm will prevent the meter from acting, substantially as described.

2. The combination in a pre-payment gas meter, of the coin receptacle, mechanism driven through the coin inserted, a shaft D' geared to the said mechanism, a worm adapted to slide on the said shaft, registering mechanism, a pinion of said mechanism geared to the worm, a spring arm bearing against the worm tending to keep one side of the thread of the worm always in contact with the teeth of the pinion and thus prevent lost motion, substantially as described.

3. The combination in a pre-payment gas meter, of the registering mechanism having a thousand feet indicator, a shaft driven in one direction when the pre-payment is made, a screw adapted to slide on but turn with said shaft, a pinion on the shaft of the thousand feet indicator acting as a nut when the screw is turned and acting when turned to slide the screw on its shaft, substantially as described.

4. The combination in a pre-payment gas meter, of the coin receptacle, mechanism therein driven through the coin inserted, a shaft K^2 geared to said mechanism and extending into the meter, a shaft D' geared to the shaft K^2, a worm adapted to slide on the said shaft D', registering mechanism geared to the worm, a shaft C having an arm bearing against the worm, and a hand adapted to travel over a dial, substantially as described.

5. The combination in a pre-payment gas meter, of the coin receptacle, mechanism driven on the insertion of the coin, the shaft K^2 geared to said mechanism, and extending into the meter, a shaft D' geared to the shaft K^2, registering mechanism, supply controlling gearing geared to said mechanism and to the shaft D', a pivoted lever F engaging with the supply controlling gearing, flag wire, an arm thereon adapted to be engaged with the lever F, so that when the lever engages with said arm the meter will be stopped and the supply of gas cut off, substantially as described.

6. The combination of the coin receptacle, driven mechanism therein, a shaft K^2 driven by said mechanism, and extending into the meter, a shaft D' geared to said shaft K^2, a worm D adapted to turn with, but slide on said shaft, registering mechanism geared to said worm, a shaft C carrying an arm bearing against the end of the worm and carrying an indicating hand, a pivoted lever F controlled by the movement of the worm, flag wire, an arm thereon, with which the lever will engage when the worm is returned to its full limit, substantially as described.

7. The combination in a pre-payment gas meter, of the registering mechanism, the supply controlling gearing, a coin receptacle, a slotted disk I mounted in said receptacle, a slotted disk K mounted directly under the disk I and geared to the supply controlling gearing, and a fixed plate M under the disk K, a slot therein, so that when the coin is dropped through the slot in the casing, and into the slots in the disks I and K, it will lock the two disks together, and on turning the disk I the supply controlling gearing will be fed forward the proper distance, and when the coin reaches the slot in the plate M, it will fall into the coin receptacle, substantially as described.

8. The combination in a pre-payment gas meter, of the registering mechanism, the supply controlling gearing geared thereto, a coin receptacle, slotted disk I, a handle therefor, a slotted disk K directly under the disk I, and geared to the supply controlling gearing through the medium of pawl and ratchet mechanism, so that on feeding the disk forward, it will drive the said gearing, but will return to its first position without driving the gearing, substantially as described.

9. The combination in a pre-payment gas meter, of the coin receptacle, the slotted disks I and K, and a fixed plate M having a slot through which the coin may pass, a locking pin j' adapted to lock the plate M at any predetermined point, so that the coin inserted in the receptacle will have more or less travel, substantially as and for the purpose set forth.

10. The combination in a pre-payment gas meter, of the coin receptacle, the slotted disks I and K adapted to receive the coin, a slotted fixed plate M through which the coin is discharged, a rack m^2 on the face of said plate over which the coin travels, so that when the coin is inserted into the slots in the disks I and K, the coin acts as a pawl in conjunction with the ratchet teeth on the plate, M, so as to prevent the return of the disks until the coin is discharged, substantially as described.

11. The combination in a pre-payment gas meter, of the slotted disks I and K, the slotted plate M, a pin j' adapted to any one of the se-

ries of holes in the plate, so that it can be adjusted to make the coin travel a greater or less distance, said plate having numbers on its edge indicating the price per thousand feet of gas the plate is set to, an opening in the casing with which the said numbers register, substantially as described.

12. The combination in a pre-payment gas meter, of the coin receptacle, the handled disk I slotted for the reception of a coin, a disk K, a vertical spindle J, a disk mounted on said spindle, a coin slot in said disk, a lug on the disk K engaging with a lug on the disk I, so that the two disks will return together, a hollow shaft mounted on said spindle J, a ratchet on said shaft, pawl on the disk K engaging with said ratchet, a gear wheel on the shaft meshing with a gear wheel on the driving shaft, extending into the meter, a ratchet wheel, and a pawl on a fixed portion of the apparatus to prevent returning of the shaft with the return of the disk K, a fixed plate M having a coin slot through which the coin passes into the receiving box, supply controlling gearing geared to the driving shaft, extending into the meter, and registering mechanism also geared to the supply controlling gearing, substantially as described.

13. The combination in a pre-payment gas meter, of the coin receptacle, slot in the top thereof, a slotted disk I directly under the top, a slotted disk K directly under the disk I adapted to be driven by the disk I through the medium of a coin, a lug on the casing adapted to engage with a projection on the disk I, so as to prevent its being turned a full turn in either direction, a fixed slotted plate M directly under the disk K through which the coin is discharged, a lug m^3 on the same to control the movement of the disk K by contact with the coin carrier k, supply controlling gearing geared to the disk K, registering mechanism also gearing with the supply controlling gearing, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM N. MILSTED.

Witnesses:

EDITH J. GRISWOLD,

HUBERT HOWSON.