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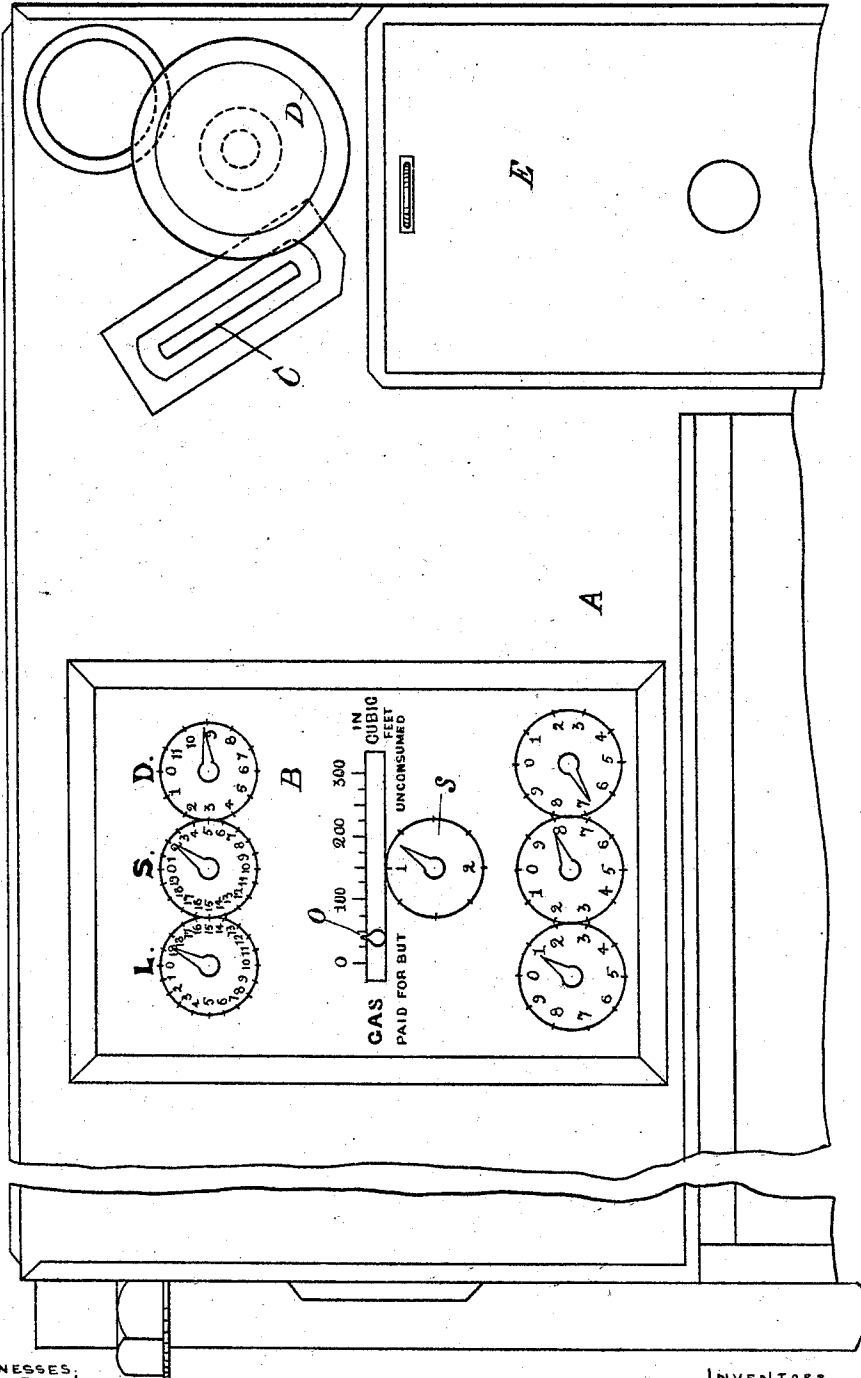
2 Sheets—Sheet 1.

T. THORP, T. G. MARSH & J. HAYNES.
COIN CONTROLLED PREPAYMENT GAS METER.

No. 537,502.

Patented Apr. 16, 1895.

Fig. 1.



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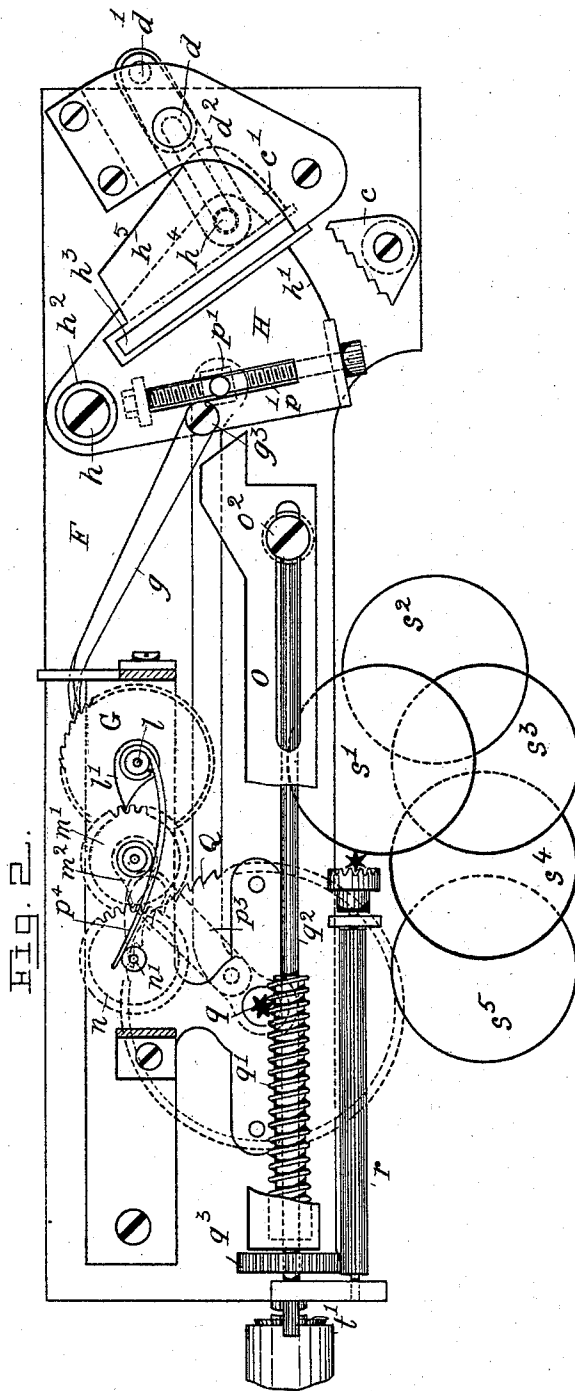
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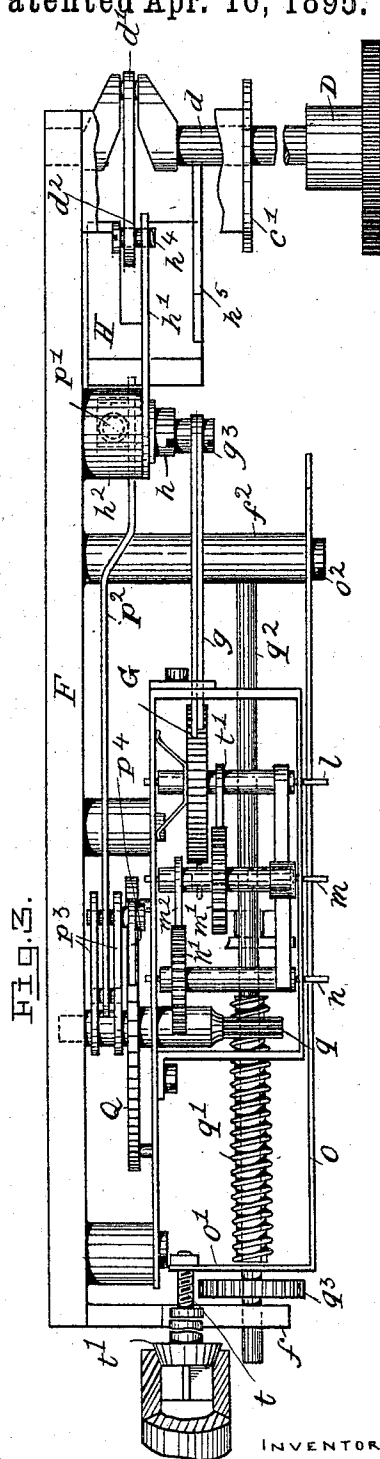
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UNITED STATES PATENT OFFICE.

THOMAS THORP, OF WHITEFIELD, THOMAS GARDINER MARSH, OF MANCHESTER, AND JOHN HAYNES, OF LIVERPOOL, ENGLAND.

COIN-CONTROLLED PREPAYMENT GAS-METER.

SPECIFICATION forming part of Letters Patent No. 537,502, dated April 16, 1895.

Application filed July 20, 1893. Serial No. 481,003. (No model.) Patented in England January 9, 1892, No. 465, and December 28, 1892, No. 23,924.

To all whom it may concern:

Be it known that we, THOMAS THORP, residing at Whitefield, THOMAS GARDINER MARSH, residing at Manchester, and JOHN HAYNES, residing at Liverpool, in the county of Lancaster, England, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Prepayment Gas-Meters, (patented as to part thereof in Great Britain by Letters Patent No. 465, dated January 9, 1892, and No. 23,924, dated December 28, 1892,) of which the following is a specification.

This invention relates to prepayment gas meters delivering a quantity of gas proportionate to the number of coins inserted and consists in the combination with said meters having an index showing the total gas consumption and a second index showing the unconsumed quantity paid for, of a third index showing the total number of coins inserted since starting the meter and of improved mechanism for actuating said third index simultaneously with the second index by the motion of the coin receiving and delivery device.

The drawings annexed hereunto show how our invention may be carried into effect.

Figure 1 shows the upper part of a gas meter and indices; Fig. 2, an elevation with part of the framing in section, and Fig. 3 a plan view of the index mechanism.

On the drawings A denotes the gasmeter; which may be of any ordinary construction, but is for the purpose of illustrating our invention represented as a dry meter.

B is the dial plate on which the upper pointers and dials show the total number of coins or sum of said coins inserted since taking the meter into use, the second horizontal sliding indicator showing the number of cubic feet of gas paid for but not yet consumed, the lower dials and pointers being the usual index showing the total gas consumption.

C is a slot for inserting the coin and D a knob or handle for transferring the coin to the box E, which can be removed and emptied by the collector.

The knob D is fixed upon a shaft d Figs. 2 and 3, which is cranked or provided with a crank pin d' to which a connecting rod d^2 is attached.

Upon a stud screwed into the foundation plate F of the index mechanism the coin carrier H is mounted so that it can oscillate. This coin carrier is formed of a flat plate h' with boss h^2 a second cross plate being bent so as to form a slot h^3 for the coin and inserted into a slot of the plate h' and secured thereto. A stud h^4 is screwed into the plate h' and passes through a slot in the connecting rod d^2 , the slot being of such length that the crank d' can turn half around without moving the stud. The bent cross plate is slotted for the connecting rod d^2 freely to pass through it. Below the coin carrier H a coin race c with ratchet teeth is fixed.

When the crank is turned back as shown in the drawings, the slot h^3 is opposite the slot C so that a coin of the predetermined kind can be inserted, when it will catch on the curved plate c' and as the crank is turned, be pushed by the end of the connecting rod d^2 against the front plate of the slot h^3 and thereby cause the coin carrier H to be pushed forward by the motion of the crank. The coin drops off the plate c' on to the race c , the ratchet teeth of which prevent the coin from being drawn backward again, until the crank d' reaches its most forward position, when the coin drops off the race c into the receptacle E. Previous to the next insertion of the coin the crank has to be returned to its starting position, as a wing plate h^5 on coin carrier H prevents the insertion of coins through the slot C until the crank has arrived in this position. The coin carrier thus has to make an oscillation of definite length for each coin inserted. This motion we utilize to operate the coin totalizing index in the following manner:

A pawl g (or two pawls $g g'$ differing in length) are mounted on a stud g^3 fixed in the plate h' and engage the ratchet wheel G, so that for each reciprocating movement of the coin carrier H, the ratchet G is advanced by

a certain number of teeth and the shaft l of said ratchet rotated. The rotation of this shaft may be utilized to work an index in any known manner ordinarily used for this purpose, that shown on the drawings being preferred. For use with pennies the size of the ratchet wheel G and the stroke of pawl g are so determined that the wheel makes one twelfth revolution for each oscillation of the coin carrier H , a pointer fixed upon the end of the shaft l moving in front of the dial marked D on Fig. 1, thus indicating the number of pence delivered into the receptacle E . A single cog l' on shaft l operates a wheel m' with twenty teeth on shaft m , a pointer on this shaft moving in front of the dial marked S and moving by one division after twelve pennies have been inserted into the box E and indicating shillings. In a similar manner a single cog m^2 on shaft m operates a wheel n' on shaft n , the number of teeth of this wheel being optional, for instance twenty, a pointer on the end of shaft n moving in front of the dial marked L , indicating pounds sterling. For use with a decimal coinage the wheels would be formed with ten teeth. By means of this index the total sum of money placed into the box E is recorded, and by subtracting the previous reading from the actual indication the collector can ascertain at once and check the number of pennies that ought to be in the box, without having to calculate the same from the gas consumption recorded by the lower index, and detect at once if the box E has been tampered with.

The pointer o moving in front of a horizontal scale indicates the unconsumed quantity of gas that has been paid for and is actuated in the following manner: Upon the coin carrier H is mounted a screw p so that it can be turned around but not move endwise, upon which screw there is threaded a nut p' formed with a pivot upon which a connecting rod p^2 is hinged. This rod is connected at its other end to a lever p^3 mounted loosely upon a stud fixed in the foundation plate F upon which stud is also mounted a ratchet wheel Q with a long boss terminating in a pinion q . A pawl p^4 engaging said ratchet wheel Q is hinged to the end of the lever p^3 , and by these means for each oscillation of the coin carrier H the ratchet wheel Q is turned for a certain number of teeth, such number depending upon the distance of the nut p' from the center stud h^2 which distance can be varied by turning the screw p . The pinion q gears with the threads of a long hollow screw q' which can slide and turn on a shaft q^2 fixed in the projections f and f' cast on the foundation plate F . Upon the end of the screw q' a wheel q^3 is fixed and between said wheel and the threaded part of the screw q' a groove is formed into which the turned part o' of the slide O enters, so that the movement of the screw q' on the shaft q^2 carries said slide along with it, the

other end of the slide being supported by a stud o^2 screwed into the projection f' which stud passes through a long slot in the slide. The slide has the pointer o fixed to it. As the ratchet wheel Q is turned at each insertion of a coin in the manner before described, the pinion q moves the screw q' and slide O to the right for a distance that can be regulated by shifting the nut p' nearer to or farther from the center of stud h^2 , and the movement and indications of the pointer made to agree with the quantity of gas obtainable for a coin paid into the meter. For instance at the price of gas of two shillings and six pence per one thousand cubic feet the nut p' would be so adjusted that the pointer traverses the scale from zero to 100 for three insertions of a penny each. The wheel q^3 on the nut gears with a long pinion r along which it slides when the screw q' and slide O are shifted as before described. On the end of the shaft of said pinion a crown wheel r' is fixed, which engages with a small pinion r^2 on the first motion shaft of the lower consumption index which is rotated by the movement of the measuring device in the usual way and from it the other index wheels and shafts are rotated through pinions and wheels $s' s^2, s^3, s^4, s^5$ in the ordinary manner. As the pinion r^2 revolves it turns the crown wheel r' and through the pinion r the wheel q^3 and screw q' in such a direction that it screws itself along the pinion q , which acts as a nut, to the left in proportion to the gas consumed, so that the pointer o moves back and indicates the quantity remaining to be consumed before a further payment requires to be made.

A screw t is screwed into the back part o' of the slide O , the head of which screw comes against the valve t' which may be either the inlet or outlet valve of the meter, and closes it when the pointer arrives at zero, so that the further supply of gas is cut off, the valve opening again by the gas pressure when a further coin has been paid in and the slide shifted thereby to the right. When the other end of the slide O has arrived at the extremity of its travel to the right it places itself behind the slot C in the casing and prevents the insertion of further coins; so that the various parts cannot be moved so far by the motion of the coin carrier H that they become locked or broken.

For meters of various constructions, the arrangement of the mechanism for actuating the coin totalizing index as well as the unconsumed gas index may be varied and we do not confine ourselves exclusively to those described, but

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination with a prepayment gas meter of a spindle having a ratchet wheel and a pointer fixed thereon, a pawl operating said ratchet wheel and hinged to a vibrating coin

carrier formed with a recess for the coin used in prepaying, a crank shaft operated from the outside of the meter by a handle, a connecting rod attached to the crank pin and formed with a slot embracing a pin in said coin carrier, and a coin race fixed below the coin carrier substantially as described.

2. The combination with a prepayment gas meter having the usual indices of the gas consumption and unconsumed but paid for quantity of gas, of a spindle forming part of and actuating a third index, a ratchet wheel fixed on said spindle, a pawl engaging with said ratchet wheel and connected to a coin carrier formed with a recess for receiving the coin, a crank shaft operated by a handle from the outside, a connecting rod attached to the crank pin and formed with a slot embracing a pin in said coin carrier, a slot being formed in the carrier for said connecting rod to pass through unless closed by the coin, a coin race fixed below the coin-carrier and a receptacle for the coins substantially as described.

3. The combination with a prepayment gas meter of an index for showing the sum of the coins paid in consisting of a spindle, pointer and dial for each denomination of coins, said spindles being rotated by gearing in the ratio of the values of the coins indicated, a ratchet wheel fixed on the first motion spindle of said index, a pawl engaging with the ratchet wheel and connected to a coin carrier formed with a recess for receiving the coin, a crank shaft operated by a handle from the outside of the meter, a connecting rod attached to the crank pin and formed with a slot embracing a pin in said coin carrier, a slot being formed in the carrier for said connecting rod to pass through unless closed by the coin, a coin race fixed below the coin carrier and a receptacle for the coin, substantially as described.

4. The combination with a prepayment gas meter having the usual consumption index and a coin totalizing index, of a slide having a pointer attached to it and moving in front of a horizontal scale, said slide being attached to a nut threaded upon a screw, which screw is rotated in one direction by the coin receiving and delivery mechanism and in the opposite direction by the first motion wheel of the gas consumption index.

5. The combination with a prepayment gas meter having the usual consumption index and a coin totalizing index operated by the motion of the coin carrier, of a ratchet wheel, a pawl engaging said ratchet wheel and attached to a lever reciprocated from the coin carrier, a pinion on the boss of said ratchet wheel engaging a sliding screw, a slide connected to said screw so as to move with the same and carrying a pointer moving in front of a scale, a wheel mounted on said screw and engaging a long pinion, a crown wheel fixed on the spindle of said pinion and in gear with a pinion on the first motion shaft of the con-

sumption index, an adjustable screw screwed to said slide, and a gas valve actuated by said screw.

6. The combination with a prepayment gas meter having the usual consumption index of an index for showing the sum of the coins paid in consisting of a spindle, pointer and dial for each denomination of coins, said spindles being rotated by gearing in the ratio of the values of the coins indicated, a crank shaft operated by a handle from outside of the meter, a connecting rod attached to the crank pin, an oscillating coin carrier formed with a recess for the reception of the coin, a pin in said carrier embraced by a slot in said connecting rod, a slot in the carrier for said connecting rod to pass through unless closed by the coin, a coin race fixed below the carrier, a receptacle for the coins below said race, a pawl hinged to the coin carrier and engaging a ratchet wheel fixed on the first motion spindle of said index, a second pawl attached to the coin carrier at a variable distance from the center of its oscillation, a second ratchet wheel engaged by said pawl and having a pinion fixed to it, a sliding screw in the thread of which said pinion engages and connected to a slide so that said slide moves with it, a pointer attached to the slide and moving in front of a scale, a wheel mounted on said screw and engaging a long pinion, a crown wheel fixed on the spindle of said pinion and in gear with a pinion on the first motion shaft of the consumption index, an adjustable stop screw fixed on said slide and a gas valve actuated by said screw.

7. The combination of a prepayment gas meter of a spindle, a ratchet wheel fixed thereon inside the case of the meter, and a pointer fixed to the outer end of said spindle and moving in front of a marked dial, a pawl actuating said ratchet wheel and attached to an oscillating coin carrier operated by means of a handle on the outside of the meter and a coin inserted into said coin carrier and interposed between the same and a reciprocating rod actuated by said handle.

8. The combination with a prepayment gas meter having the usual gas consumption index and an index showing the unconsumed quantity of gas paid for, of a third separate index showing the total sum of coins inserted into said meter in the different denominations of coins used in the respective coinage, said index being operated by a spindle having a ratchet wheel fixed thereon and a pawl engaging with said ratchet wheel and attached to an oscillating coin carrier operated by means of a handle on the outside of the meter and a coin inserted therein.

9. The combination with a prepayment gas meter having the usual gas consumption index and an index showing the unconsumed quantity of gas paid for of a third separate index showing the total sum of coins inserted

into said meter in the different denominations
of coins used in the respective coinage, said
index being operated by a spindle having a
ratchet wheel fixed thereon, a pawl engaging
5 with said ratchet wheel and attached to an
oscillating coin carrier operated by means of
a handle on the outside of the meter and a
coin inserted into said coin carrier.

In testimony whereof we have hereunto af-

fixed our signatures in presence of two wit-
nesses.

THOMAS THORP.
THOMAS GARDINER MARSH.
JOHN HAYNES.

Witnesses:

CARL BOLLÉ,
RIDLEY JAMES URQUHART.