No. 676,206. Patented June 11, 1901.

A. STANSFIELD.

COIN FREED PREPAYMENT MECHANISM FOR GAS METERS.

(Application filed June 6, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

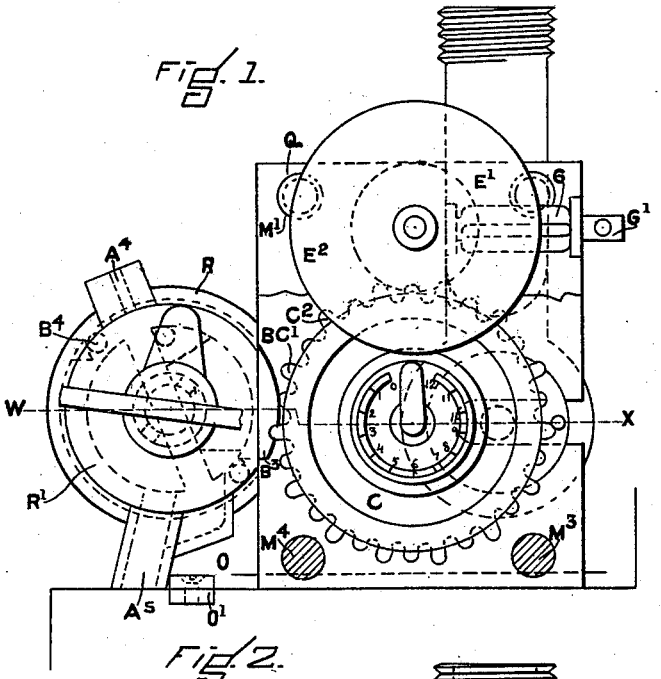

Fig. 2.

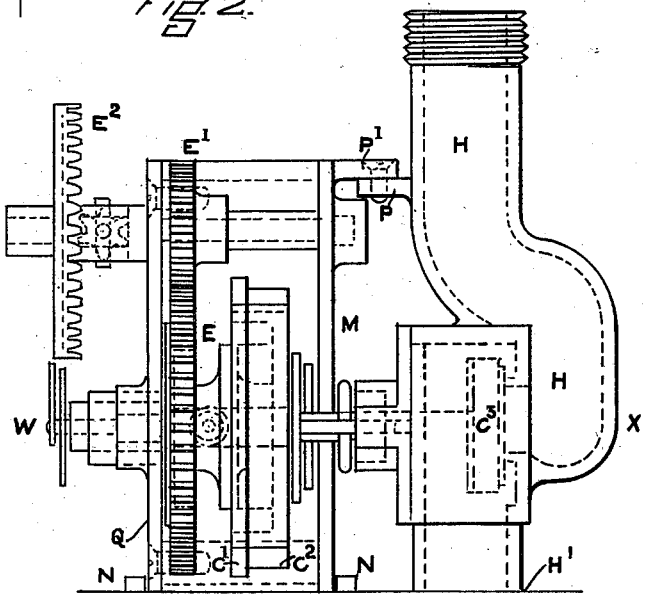

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Fig. 3.

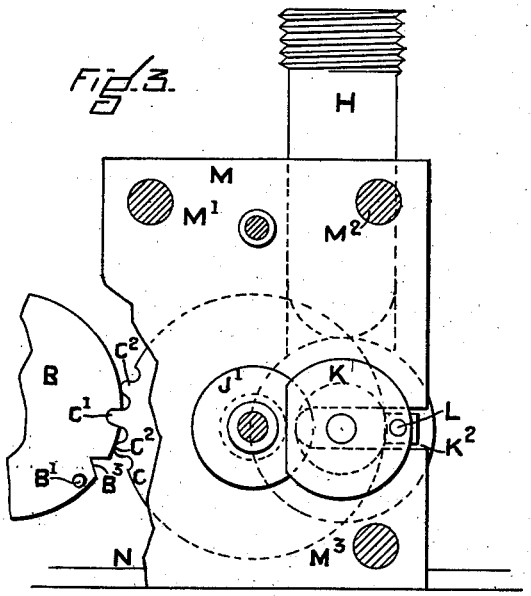
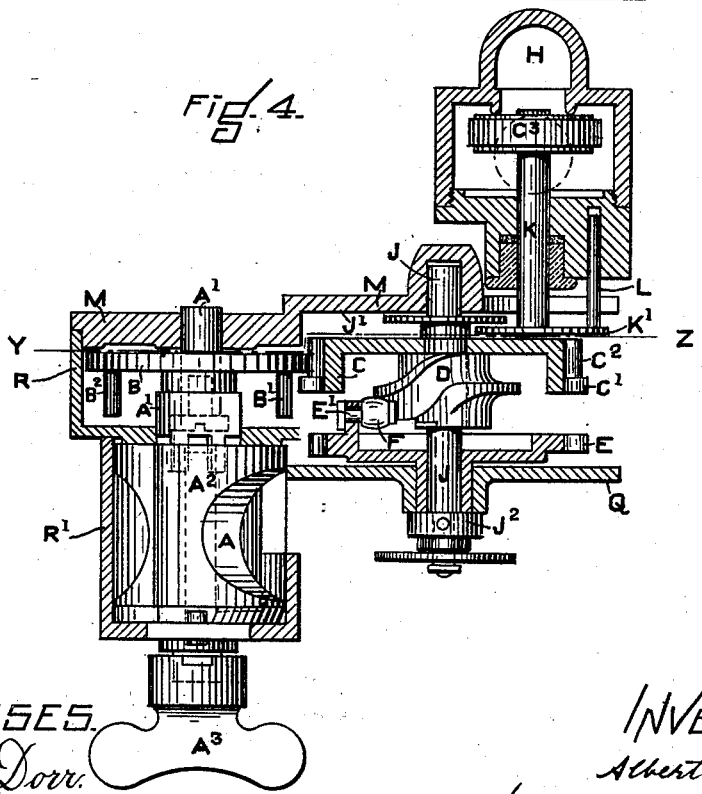


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALBERT STANSFIELD, OF OLDHAM, ENGLAND, ASSIGNOR TO METERS LIMITED, OF MANCHESTER, ENGLAND.

COIN-FREED PREPAYMENT MECHANISM FOR GAS-METERS.

SPECIFICATION forming part of Letters Patent No. 676,206, dated June 11, 1901.

Application filed June 6, 1900. Serial No. 19,341. (No model.)

To all whom it may concern:

Be it known that I, ALBERT STANSFIELD, of Oldham, in the county of Lancaster, England, have invented certain new and useful Improvements in Coin-Freed Prepayment Mechanism for Gas-Meters, of which the following is a specification.

In order that my said invention may be more easily understood and the more readily carried into effect, I have hereunto appended a sheet of drawings, wherein—

Figure 1 is a front view with part of the front casing removed. Fig. 2 is an end view not showing the coin-receiving mechanism; Fig. 3, a view of part of the mechanism through the line Y Z in Fig. 4, and Fig. 4 a partial sectional plan view through the line W X in Fig. 1.

In carrying my said invention into effect I cast or otherwise form a back plate M with four projecting nipples or pillars M' M^2 M^3 M^4, to which are attached by screws the front plate Q. To one part of the back plate the casing R, containing the disk B, is affixed, and to the casing R is fixed the casing R', inclosing the coin-receiver A. The coin-receiver A is of the usual construction and borne in the framing, so as to be capable of a half-revolution by the thumb-screw A^3. It contains a slot which can be brought into register with the slot A^4, arranged, as usual, for the reception of the coin, and also with a slot A^5, by means of which the coin can be discharged into a money-box or other receptacle placed below. The mechanism is mounted on the top of the meter-case at one side of the chamber containing the usual indicating mechanism.

Concentric with the coin-receiver is the short spindle A', borne as shown in Fig. 4 and having at its inner end a claw A^2, with which the coin when borne by the coin-receiver A partly engages, so as to form a connection between the receiver A and the spindle A'. On the spindle A' the disk B is formed. B is constructed with two pins B' B^2, placed diametrically opposite to each other. In the edge of the disks immediately following the pins two recesses or gaps B^3 B^4 are cut. The edge of the disk protrudes into the path of the teeth of a wheel C, hereinafter called the "measuring-wheel," as clearly shown in the drawings. When the disk B is rotated, one of the pins—say B'—engages with one of the long teeth C' and rotates C a definite angular distance. The gap B^3 passes over the succeeding short tooth C^2, and then the disk B is in contact with two of the teeth C^2, so as to lock it and prevent any backward movement of the disk B.

The measuring-wheel C is fixed on a spindle J, parallel to the coin-receiver and spindle A'. It is furnished on its periphery with two sets of teeth C' C^2 of equal pitch, but occurring alternately on the periphery. One set C' is narrower, but longer, than the second set C^2, which are the full width of the periphery, while the teeth C' are only a portion of the width. The spindle J is borne in the framing of the mechanism, in which it can slide endwise. On the inner face of the measuring-wheel C a cam-course D is formed, the said course being for the greater portion formed at right angles to the axis of the spindle J, but, as shown in Fig. 4, is for a small portion of its periphery angularly disposed to the said axis.

Mounted loosely upon the axis J is a wheel E, carrying at one point an arm E', which has a pin fixed in it. A small roller or runner F is loosely mounted on the pin and engages with the cam-course D. The sleeve of the wheel E passes through the front framing and is held from moving endwise with the spindle J by a collar J^2, through which and into the boss of the wheel E a small pin is driven. The wheel E can thus revolve, but not move endwise, while the measuring-wheel C can both revolve and, along with the spindle J, move endwise. Also fastened on the sleeve of the wheel E is a small dial. (Shown in Fig. 1 and numbered "0" to "12.") On the front end of the spindle J a finger is fixed, which when the measuring-wheel is operated by a coin is moved over the face of the dial, so as to indicate the number of coins inserted. This is a common device and forms no part of my invention.

The wheel E is driven from the index-shaft of the meter by means of a pinion G, the shank of which, G', engages when the mech-

anism is in working position with a cross-shaft geared to the index-shaft, the said cross-shaft being held in position in a well-known manner. The pinion G gears with a crown-wheel E^2, which is arranged to be easily removable, so as to be exchanged for a larger or smaller one when it is desired to vary the amount of gas given in exchange for one coin. E^2 is fixed on a cross-spindle borne by the framing and having fixed on it a pinion E^3, which gears with the wheel E. Thus the rotation of the pinion G from the index-shaft, which occurs when gas is passing, causes the rotation of the wheel E in a direction contrary to that in which the measuring-wheel C is rotated by the coin. The effect is that when the measuring-wheel C is rotated (assuming the parts to be in the position shown in Fig. 4) by the rotation of the disk B in the manner previously described the runner F engages with the lower side of the cam-course, and as the runner F always rotates in one plane the cam D, wheel C, and spindle J are drawn forward. This opens the valve C^3, as afterward described, and as gas then passes the wheel E is rotated with the runner F, so as to bring the latter back to its initial position and by pressing on the other edge of the cam-course to force back the spindle J to its original position.

The valve C^3 is mounted on a spindle K, which slides in the frame of the valve-chamber H, which is formed in the inlet-pipe. At H the valve-chamber is fastened to the meter-case, so as to be independent of the framing of the mechanism. The spindle K passes through a stuffing-box, so as to avoid any leakage of gas. At its forward end it has fixed on it a disk or washer K′, which when the mechanism is in working position overlaps a disk or washer J′, fixed on the spindle J. The spindle K and washer K′ are prevented from rotating by means of a pin L, sliding in a hole in the frame of the valve-chamber.

In order to enable the coin-receiving and measuring mechanism to be easily removed, I fix on the meter-case two small bars N, acting as guides, and on the back frame M I form a bracket P, which overlaps a bracket P′, attached to H. A screw can be passed through a seal-cup formed in an L-shaped cover (made to go over the top and front of the mechanism) and the bracket P and to be screwed into the bracket P′, thus securing the mechanism in position. In order to make it still more secure, I form a foot O on the case carrying the coin-receiver and affix to the under side of the meter-case a washer O′, with a threaded eye for the reception of a screw passing through O and the case. By the removal of the screws at O and P the coin-receiving and measuring mechanism can be removed, leaving the valve-box and spindle in position, thus facilitating inspection, while it can obviously be readily replaced. A slot K^2 is formed in the back frame M to permit of it sliding over the spindle K.

When the mechanism is in working position, it is obvious that when the spindle J is moved in a forward direction the disk or washer J′ will pull the disk or washer K′ and the spindle K forward, thus taking the valve C^3 from its seat, while when J is moved backward the wheel C will press against the spindle K and washer K′ and force the valve on its seat. The extent of movement of the valve is obviously determined by the throw of the cam, but it is fully opened by two coins, afterward remaining stationary until closed in the manner described. A stop is provided at the end of the flat portions of the cam-course, so that no more than twelve coins can be inserted successively.

Having now fully described my invention, what I desire to claim, and secure by Letters Patent, is—

1. In coin-freed prepayment apparatus for gas-meters, the combination with a valve and valve-spindle mounted to reciprocate for opening and closing the gas-supply pipe, of an endwise-movable spindle independent of the valve-spindle and having a cam and a toothed measuring-wheel secured thereto, means cooperating with the cam to reciprocate the endwise-movable spindle as the cam and toothed wheel rotate in one direction and the reverse, connections between the said two spindles whereby they move endwise together to open and close the valve, a disk having means for coöperating with the teeth of the measuring-wheel for rotating the latter and the cam to open the valve, coin-operated means for rotating said disk, and connections with the meter mechanism for moving the cam to close the valve.

2. In coin-freed prepayment apparatus for gas-meters, the combination with a valve and valve-spindle mounted to reciprocate for opening and closing the gas-supply pipe, of an endwise-movable spindle independent of the valve-spindle and having a cam and a toothed measuring-wheel secured thereto, means cooperating with the cam to reciprocate the endwise-movable spindle as the cam and toothed wheel rotate in one direction and the reverse, overlapping disks or washers carried by said two spindles whereby reciprocating movements of the cam are transmitted to the valve, a disk having means for coöperating with the teeth of the measuring-wheel for rotating the latter and the cam to open the valve, coin-operated means for rotating said disk, and connections with the meter mechanism for moving the cam to close the valve.

3. In coin-freed prepayment apparatus for gas-meters, the combination with a valve mounted to reciprocate for opening and closing the gas-supply pipe, of the disk B having diametrically opposite pins B′, B^2, and marginal gaps or recesses B^3 B^4 adjacent to said pins, the wheel C having long teeth C′ and short teeth C^2, said wheel being mounted to rotate and reciprocate, the cam D carried by the wheel C, the wheel E mounted to ro-

tate but not reciprocate and having the runner or roller entering the groove of the cam, gearing connecting the wheel E with the meter mechanism, and connections whereby movements of the wheel C and the cam in the direction of their axis are transmitted to the valve.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT STANSFIELD.

Witnesses:
ROBERT E. BRADDOCK,
RICHARD H. ORME.