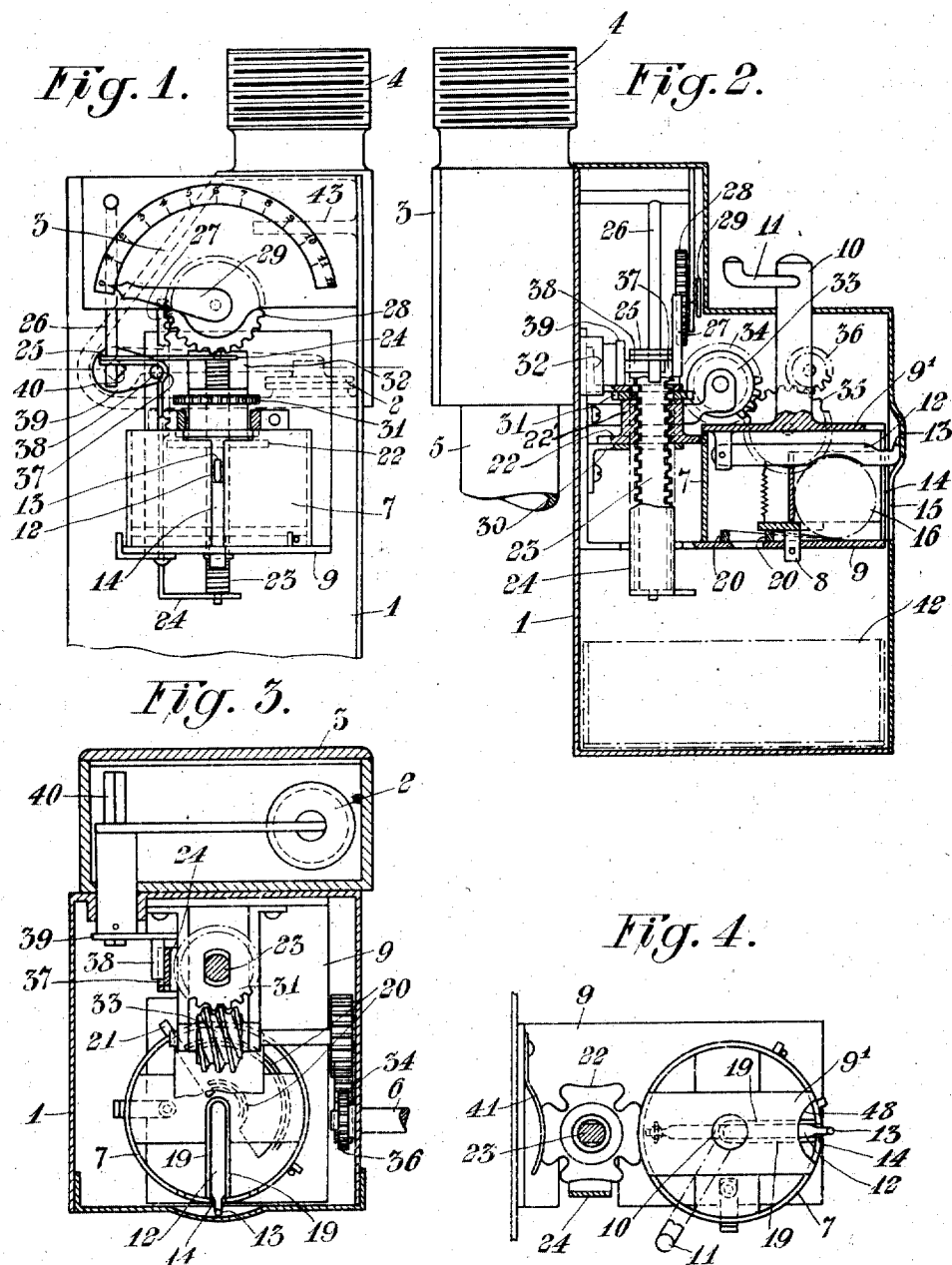


1,234.932.

Patented July 31, 1917.



Inventor:

Nils David Nilson,

By: George Bayard Jones.

UNITED STATES PATENT OFFICE.

NILS DAVID NILSON, OF STOCKHOLM, SWEDEN.

PREPAYMENT GAS-METER.

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Specification of Letters Patent.

Patented July 31, 1917.

Original application filed December 22, 1913, Serial No. 808,167. Divided and this application filed February 28, 1916. Serial No. 80,814.

To all whom it may concern:

Be it known that I, NILS DAVID NILSON, a subject of the King of Sweden, residing at Stockholm, in the Kingdom of Sweden, have
5 invented a new and useful Improvement in Prepayment Gas-Meters, of which the following is a specification.

This application is a division from my co-pending application Serial No. 808167, filed
10 on December 22, 1913.

My present invention refers to a prepayment gas meter and has for its object to provide simple and effective means for moving a member of the gas valve operating mechanism in one direction according to the number of coins deposited in a coin controlled apparatus cooperating with the same, and for gradually retrieving the said member as the gas is consumed.

20 The invention is broadly characterized by this that a gear receiving intermittent rotary motion in one direction from the coin controlled apparatus, is formed as a nut for a screw journaled in a frame having an operative connection with the gas valve. On the said screw a worm-wheel is slidingly but not rotatably mounted, which worm-wheel engages with a worm driven from a shaft of the main gas meter.

30 The accompanying drawing illustrates one form of the invention.

Figure 1 is a front elevation of the apparatus, a portion of the cover being removed.

Fig. 2 is a sectional side view.

35 Fig. 3 is a top view of a horizontal section.

Fig. 4 shows the coin controlled apparatus and a portion of the gearing viewed from above.

40 All parts of the apparatus with the exception of the valve for the opening and closing of the gas-piping are arranged within the casing 1.

The gas valve 2 is located in a box-like section 3 at the rear of the casing, into which section the main-pipe 4 opens and from which the pipe 5 leads to the main gas-meter, said pipe being controlled by means of the valve 2. The driving mechanism of
50 the main gas-meter is connected to the shaft 6 (Fig. 3), which in hereinafter described manner is geared to the mechanism of the prepayment meter.

The coin controlled mechanism for oper-

ating the meter mechanism for opening and closing the gas valve 2 may suitably be of the construction described and claimed in my co-pending U. S. Patent Application Serial No. 808,167, and which consists, mainly, of a cylindrical drum 7 adapted to turn by means of a pivot 8 in a stationary bottom plate 9 and provided with a cover or cross-piece 9¹, to which is secured the spindle 10, which extends through the casing 1 and on the projecting part carries a handle 11 of suitable shape by means of which the drum 7 may be turned. To the under side of the cover or cross-piece 9¹ is pivoted one end of a lever 12, the other end of which is provided with a finger 13 which projects through a slot 14 in the drum. When the drum is in normal position as shown in Figs. 1, 2, and 3 the slot 14 will be right opposite a similarly shaped slot 15 in the front side of the casing 1. The coin 16 can now be introduced into the drum from outside through both openings. When the drum is turned by means of the handle 11, the coin is brought along and remains standing on edge. In the path which the coin has to pass during the turning of the drum, are located two arc-shaped and concentric ribs or guides 20 projecting from the bottom 9, which increase in height from the starting position of the coin, as shown in Fig. 2, unto a radial slot 21 in the bottom 9. As the coin is brought along at the movement of the drum 7, it slides on the two ribs 20, and is in this manner elevated as the ribs increase in height, and consequently the end of the lever 12 provided with the finger 13 is raised. The finger 13 is thereby brought in such position that during the last period of the turning of the drum it will engage with and turn an intermittent gear 22, of the shape shown in Fig. 4. This intermittent gear forms a part of the meter mechanism which opens and closes the gas-valve 2. This mechanism is arranged in the following manner:
The main part consists of a screw 23, the ends of which are pivoted in a frame 24. From this latter extends a rigidly secured arm 25 which slides up and down on a fixed guide 26, and a rack 27 meshing with a pinion 28 secured to the shaft of an index hand 29. The hub 22¹ of the above mentioned intermittent gear 22 is shaped as a nut, fitting the screw 23, and the intermittent gear 22 is

supported from below by a fixed bracket 30 (Fig. 2), and has above it a worm-wheel 31. This latter wheel which is supported from above by means of another bracket 32 (Figs. 1 and 2), does not mesh with the threads of the screw 23, but the screw can slide longitudinally through the worm-wheel 31. When rotating, however, this wheel will force the screw to turn, on account of the screw being faced off on two sides and inserted in a correspondingly shaped opening in the worm-wheel 31 (Fig. 3). This worm-wheel meshes with the worm 33, which is connected by means of the gears 34, 35 and 36 with the shaft 6, said shaft as before mentioned being connected to the mechanism in the main gas-meter. The upper part of the frame 24 is provided with a slot 37 (Fig. 1) into which is inserted a stud 38 on a crank 39, secured to the shaft 40 of the valve 2. The related arrangement operates in the following manner:

As the drum 7 is turned the lever 12 is swung upward so that the finger 13 comes in contact with and moves the intermittent gear 22 one step, the gear, which also serves as nut for the screw 23, will raise the screw upward a corresponding distance. The frame 24, connected to the screw, is carried along, (assuming that the frame is in or near its lowermost position), and by means of the slot 37 it will lift the stud 38, so that the crank 39 is turned and the gas-valve 2 opened. The gas coming from the main pipe 4 and streaming through the box-like section 3 will then escape through the pipe 5 into the main gas-meter, the driving mechanism of which is then put into operation. The shaft 6 is thereby turned and the movement is transmitted to the worm 33, which in turn will move the worm-wheel 31. The screw 23 is then turned in the now stationary nut 22 of the intermittent gear 22. As shown in Fig. 4, the intermittent gear is divided into four sections, each section provided with a profile which lies near to and corresponds to the outside of the drum 7. As long as the intermittent gear and the drum are in the position indicated in Fig. 4, the gear cannot turn, but is rigidly locked, as well as the mechanism connected to the gear. On the other hand, when the finger 13 has come into engagement with the wheel, said wheel is able to turn as the teeth of the wheel can now swing in a recess 48 provided in the cover or cross-piece 9. The gearing is so arranged that as the screw is being lowered by the above-mentioned turning of the worm-wheel 31, the frame 24, connected to the screw, is lowered and returns, by means of the slot 37 and the stud 38, the crank 39, so that the valve 2 again becomes closed. During this time, however, a gas quantity corresponding to a coin has been consumed. In order rigidly to secure the intermittent

gear in case that the drum is turned without the lever 12 being raised, there is secured close to the gear a spring 41, which is in engagement with one of the arched recesses in the gear.

When the revolving of the drum 7, and the turning of the intermittent gear 22 one step has been performed, the coin 16 has come right over the slot 21 in the bottom plate 9 and falls through the slot down in the underlying coin-box 42. The lever 12 is then lowered and the finger 13 releases the intermittent gear, whereby the drum 7 can be turned back to its normal position, said returning being performed immediately after the turning of the drum with the coin is completed. If desired another coin can instantly be inserted and the drum can be turned again, whereby the gas-valve 2 is opened one step further. Repeated introduction of coins can take place three times in succession and the gas valve is opened each time one step, until at the third time it hits the stop 43. Consequently it does not turn further on repeated insertion of coins. The frame 24, which by means of the rack 27 actuates the indicating device as the coins are introduced, can nevertheless move further upward, as the stud 38 on the crank 39, after the said third movement, has come out of the recess 37 in the frame, and is resting against the side of the frame and sliding alongside the same.

I claim:

1. In a prepayment gas meter, the combination of a gear receiving intermittent rotary motion in one direction, a frame movable in the axial direction of said gear, a screw threaded into said gear and rotatably journaled in the frame, means for guiding the movement of the frame in the longitudinal direction of the screw and for preventing the frame from turning with the screw, a gas valve, and means for connecting said frame with said gas valve, substantially as and for the purpose set forth.

2. In a prepayment gas meter, the combination of a gear receiving intermittent rotary motion in one direction, a frame movable in the axial direction of said gear, a screw threaded into said gear and rotatably journaled in the frame, means for guiding the movement of the frame in the longitudinal direction of the screw and for preventing the frame from turning with the screw, a gas valve, a shaft for said valve, a crank on said shaft engaging the frame and adapted to be brought out of engagement with the said frame when the valve has been opened to a predetermined extent, substantially as and for the purpose set forth.

3. In a prepayment gas meter, the combination of a gear receiving intermittent rotary motion in one direction, a frame movable in the axial direction of said gear, a

screw threaded into said gear and rotatably journaled in the frame, means for guiding the movement of the frame in the longitudinal direction of the screw and for preventing the frame from turning with the screw, a gas valve, means for connecting said frame with said valve, a rack secured to said frame, an index hand, a shaft for said hand, and a pinion on said shaft meshing with the rack, for indicating the position of the frame and thus the amount of opening of the gas valve and the gas purchased, substantially as and for the purpose set forth. 10

NILS DAVID NILSON.