No. 771,633. PATENTED OCT. 4, 1904.

A. HARE.

TIME GAS COCK.

APPLICATION FILED OCT. 27, 1903.

NO MODEL.

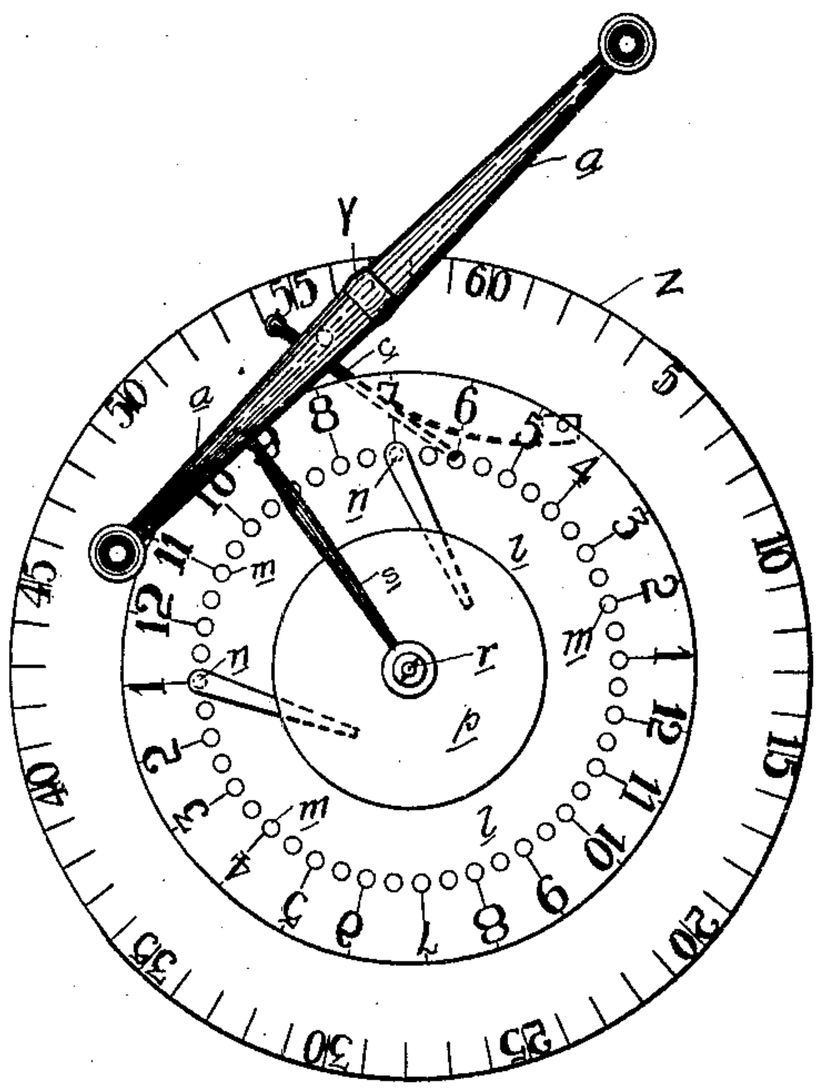

FIG. 1.

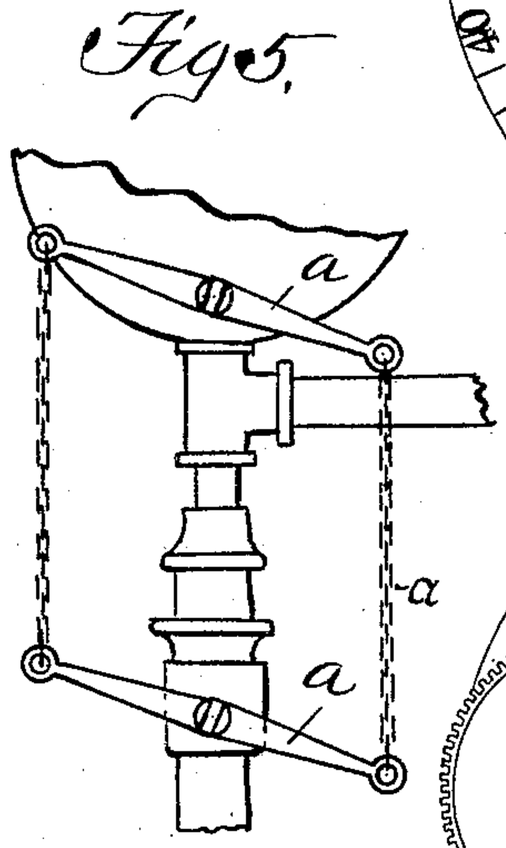

FIG. 2.

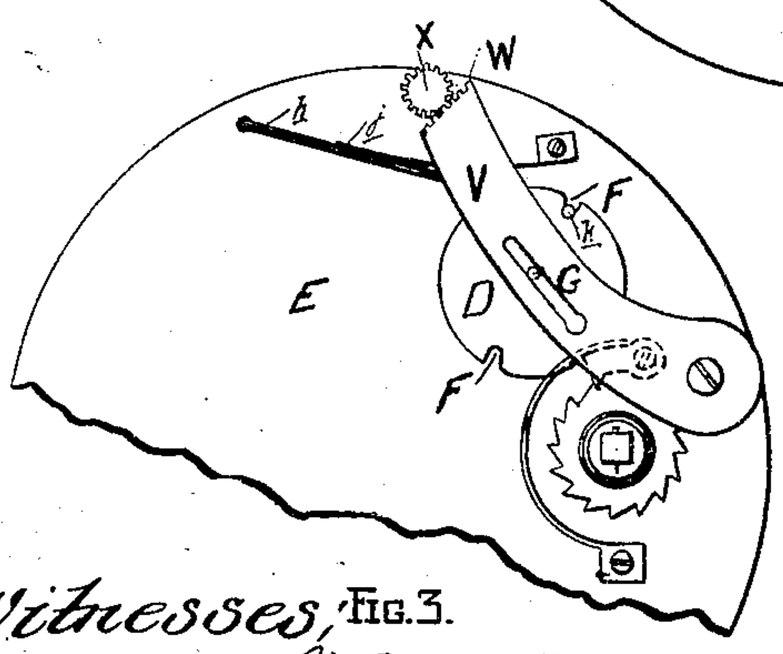

FIG. 3.

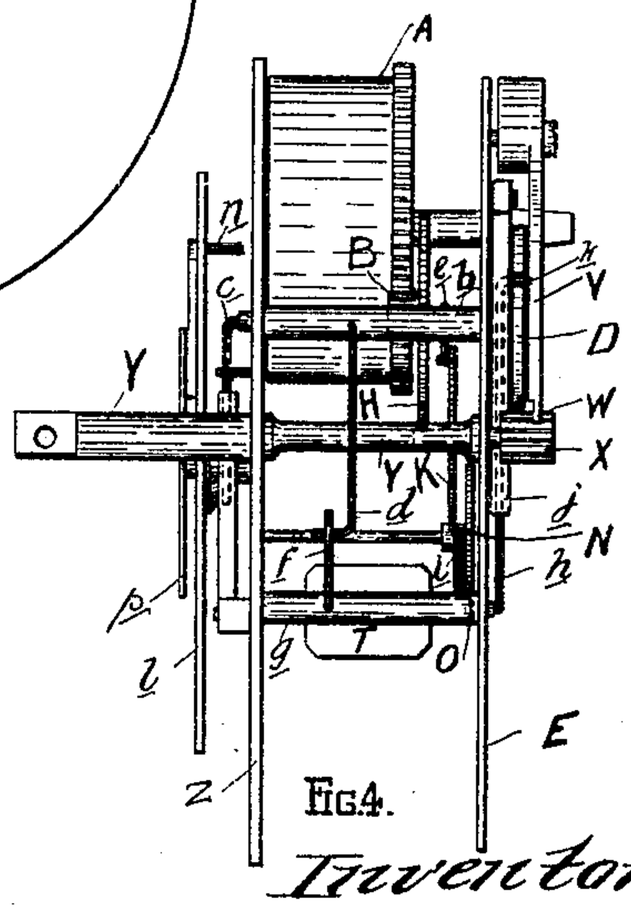

FIG. 4.

Witnesses,

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No. 771,633. Patented October 4, 1904.

UNITED STATES PATENT OFFICE.

ARNOLD HARE, OF AUCKLAND, NEW ZEALAND.

TIME GAS-COCK.

SPECIFICATION forming part of Letters Patent No. 771,633, dated October 4, 1904.

Application filed October 27, 1903. Serial No. 178,754. (No model.)

To all whom it may concern:

Be it known that I, ARNOLD HARE, engineer, a subject of His Majesty the King of the United Kingdom of Great Britain and Ireland, and a resident of the Great North Road, in the suburbs of the city of Auckland, in the Provincial District of Auckland and Colony of New Zealand, have invented a new and useful Apparatus for Automatically Turning on and off Gas and other Taps or Cocks, of which the following is a specification.

This apparatus is devised for the purpose of automatically turning on and off gas and other taps and cocks, and chiefly for shop-front lights, where it can be so set that the gas will automatically be turned on at a set time and turned off some time or hour later.

The apparatus or mechanism is placed or mounted within and without the case of a clock the works of which are utilized to rotate an additional face and dial, whereby the parts of this apparatus are caused to turn on and off the tap or cock, as is hereunder set forth.

The accompanying drawings show four figures, of which—

Figure 1 is a front elevation representing a clock-face divided into sixty minute-spaces and a superposed smaller dial or face numbered for twenty-four hours with forty-eight holes therein and showing swinging double-arm-lever stop pins and spring. Fig. 2 is a front elevation of back plate, showing portions of mechanism central between front and back plates of clock. Fig. 3 is a broken elevation of outside of back plate, showing the parts of mechanism mounted on or attached to outer side of back plate; and Fig. 4 is a plan of all parts fitted to front and back plates. Fig. 5 is a detail in elevation, showing the rock-arm *a*, hereinafter described, connected with a gas-valve.

The cog-wheel A, made the same as the spring-wheel of the ordinary clock, works into the pinion-wheel B, which has an eighty-toothed cog-wheel H mounted on the same arbor C. A stop-wheel D also works on the same arbor C and is fitted on the outside of the back plate E. This stop-wheel D has two nicks F cut out of its periphery diametrically opposite to each other. A crank-pin G is fixed on the face of the stop-wheel D. The eighty-toothed cog-wheel H works into an eight-toothed pinion-wheel J, which has a sixty-four-toothed cog-wheel K working on the same arbor L. A stop-pin M is let into the wheel K near its edge. The sixty-four-toothed cog-wheel K works into an eight-toothed pinion-wheel N, which has another toothed cog-wheel O working on the same arbor P. A stop-pin R is fixed in the cog-wheel O near its periphery. This cog-wheel O works into a pinion-wheel S, which has a fan or vane T mounted and working on the same arbor U to regulate the speed. All the above parts except the stop-wheel D, which works on an extension of the arbor C, are mounted between the plates of the clock.

A slotted and slightly-curved lever or arm V is fitted on the outside of the back plate E, which on the movement of the crank-pin G moves slightly from one side to the other, whereby the rack-toothed formation W on the free end of the lever V works in a twelve-toothed pinion-wheel X, which is mounted on the arbor Y, journaled between and to the back plate E and the front plate or minute-face Z, as clearly shown in Fig. 4. The arbor Y is projected through and beyond the front plate or face Z and has a double arm *a* fitted thereon, as shown clearly in Fig. 1. The to-and-fro movement of the lever V causes three of its teeth to turn the pinion-wheel X one-quarter of a revolution each way. On one side of this arbor Y and between the plates a shaft *b* is journaled, having two projections or levers *c* and *d* and one stop-pawl *e*, one lever, *c*, straight, which runs across the face Z, and one lever, *d*, specially shaped, which lever *d* on the motion of the lever *c* lifts up an arm *f* on a similar shaft *g* to free the wheel O, while the stop-pawl *e* is caused to pass free of the pin M on the wheel K to also release the latter. The other shaft, *g*, has also two levers *h* and *f* and a stop-pawl *i*, one lever, *h*, on the outside of the back plate E kept in place by the spring *j*, which lever or detent *h* has a projection *k* at the outer end, which projection *k* on the raising of the lever *c*, communicated by the shaft *b*, levers *d* and *f*, and shaft *g*, is lifted

up out of one of the diametrically opposite notches or nicks F on the stop-wheel D. The lever *f* is acted upon by the lever *d* on the shaft *b*. The stop-pawl *i* is bent and engages the stop-pin R while the outside projection *k* is in one of the nicks F. The movement of the cog-wheel H is stopped thereby.

The sixty-minute front plate or face Z is a fixture and has a dial *l* centrally fixed thereover and clear of it. This dial *l* makes one revolution in twenty-four hours and has its face marked "1" to "12" twice over. Forty-eight holes *m* are made through the dial *l*, each of which marks half an hour. Two pins *n*, with arms set at right angles, (see Fig. 4,) are provided to be placed, as required, in any two of the half-hour holes *m*, and a small plate *p* (see Fig. 1) is placed over and central to the dial *l*. The dial *l* is connected to the works proper of the clock, which works are neither specified here nor shown on the drawings, as any clock will serve the purpose by working the dial *l* and the arbor or spindle *r*, to which the minute-hand *s* is connected.

When it is required to set the apparatus or mechanism so that it will act in the way required, the pins *n* are placed in two of the holes *m*, according to the time of turning on and turning off decided upon. In Fig. 1 the hour six on the dial *l* opposite to the sixty minutes on the minute-plate Z and the minute-hand *s*, pointing to the fifty-two minutes, indicate that the time when setting the mechanism is eight minutes to six o'clock, and at the time that the mechanism is set to turn the tap on by the movement of the double arm *a* is at seven o'clock and off at one o'clock immediately following by the counter or opposite movement of the arm *a*. The pins *n* being respectively placed in the holes *m* immediately opposite to the figures "7" and "1" and their arms are slipped under the small plate *p*, which holds them in position, the clock being wound up and going carries the dial *l* round in its rotation until the pin *n* opposite to the figure "7" meets and engages the lever or straight projection *c* and lifts it up. This lifting up of the lever causes the shaft *b* to lift up the pawl *e* and releases the stop-pin M and also the lever *f*, which turns the shaft *g*, which raises the pawl *i*, and so releases the stop-pin R and lifts the projection *k* up out of the nick F. This movement allows the spring in the first cog-wheel A to act, the said spring having been previously wound up in the usual way, and drive the train of wheels H, K, and O until the projection *k*, running on the periphery of the stop-wheel D, falls into the other nick F. When the first pin set at "7" has passed the lever *c*, it (the lever *c*) being thereby raised and the pawls *e* and *i* having released, the stop-pins M and R drop back again, and the wheels move on until the projection *k* of the lever *h* falls into the next nick F, which causes the pawls *i* and *e* to engage the stop-pin R, and so check any further movement of the mechanism until the pins *n*, set at the figure "1," engages the lever *c*. An ordinary ratchet-wheel pawl and spring are provided on the outside of back plate to control the winding up of the winding-up spring within the cog-wheel A.

The great advantage of this apparatus or mechanism is that it can be fitted to any tap and be adjusted to turn it off or on at given periods; but its greatest use will be in connection with street or other lamps fitted with incandescent burners, carrying a pilot-light, as with this apparatus the lamp can be automatically turned on at any set time and turned off later, as set for, whereby the services of the ordinary lampman can be dispensed with.

In Fig. 5 I illustrate one adaptation of the invention, showing the same as applied to a gas tap or valve. In this case the opposite ends of the rock-arm *a* are connected by chains, as *a'*, to the valve, so that on the oscillation of said rock-arm the valve will be alternately closed and opened to control the flow of gas.

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

1. In a device of the class described, a motor-operated disk, a detent for normally holding the disk against rotation, a clockwork-operated dial, means coöperative with the dial for operating the detent to release said disk, a shaft having a gear, an oscillatory arm having teeth to mesh with said gear to operate the shaft, and means connected with the disk for operating said arm.

2. In a device of the class described, a motor-operated disk, a detent for normally holding the disk against rotation, time-controlled means for periodically operating the detent to release the disk, a gear, an oscillatory arm having teeth to mesh with said gear, to operate the same, and means coöperative with said disk for operating said arm.

3. In a device of the class described, a motor-operated disk having a peripheral notch, a spring-controlled detent having a projection normally engaged in said notch, time-controlled means for operating the detent in opposition to its spring to release the disk, a gear, an oscillatory arm having teeth to mesh with said gear to operate the same, and means coöperative with the disk for periodically operating said arm.

4. In a device of the class described, a motor-operated disk having diametrically opposite peripheral notches, a spring-controlled detent having a projection, the spring serving to hold the projection normally in one of the notches, time-controlled means for intermittently tripping the detent, a gear, an oscillatory arm having teeth to mesh with said gear, and means connected with the disk for intermittently actuating said arm.

5. In a device of the class described, a mo-

tor-operated disk, a detent for normally holding the disk against rotation, said disk having a crank-pin, a clockwork-operated dial, a trip device operative with said dial, means adapted to be actuated by said trip device for operating the detent, a shaft having a gear, and a longitudinally-slotted oscillatory arm having teeth to mesh with said gear to operate the shaft, the slot of said arm being arranged to receive said crank-pin.

6. In a device of the class described, a motor-operated disk having a notch, a detent provided with a projection, yieldable means acting against the detent to hold the projection normally in said notch, a clockwork-operated dial, means operative with the dial for actuating the trip device in a direction to release said disk, a shaft, and mechanism actuated by the disk for turning the shaft.

7. In a device of the class described, a motor-operated disk having a notch, a detent provided with a projection, yieldable means acting against the detent to hold the projection normally in said notch, a clockwork-operated dial, means operative with the dial for actuating the trip device in a direction to release said disk, a shaft provided with a gear, an oscillatory gear member, and mechanism actuated by the disk for imparting a to-and-fro movement to the said gear member.

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Witnesses:

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