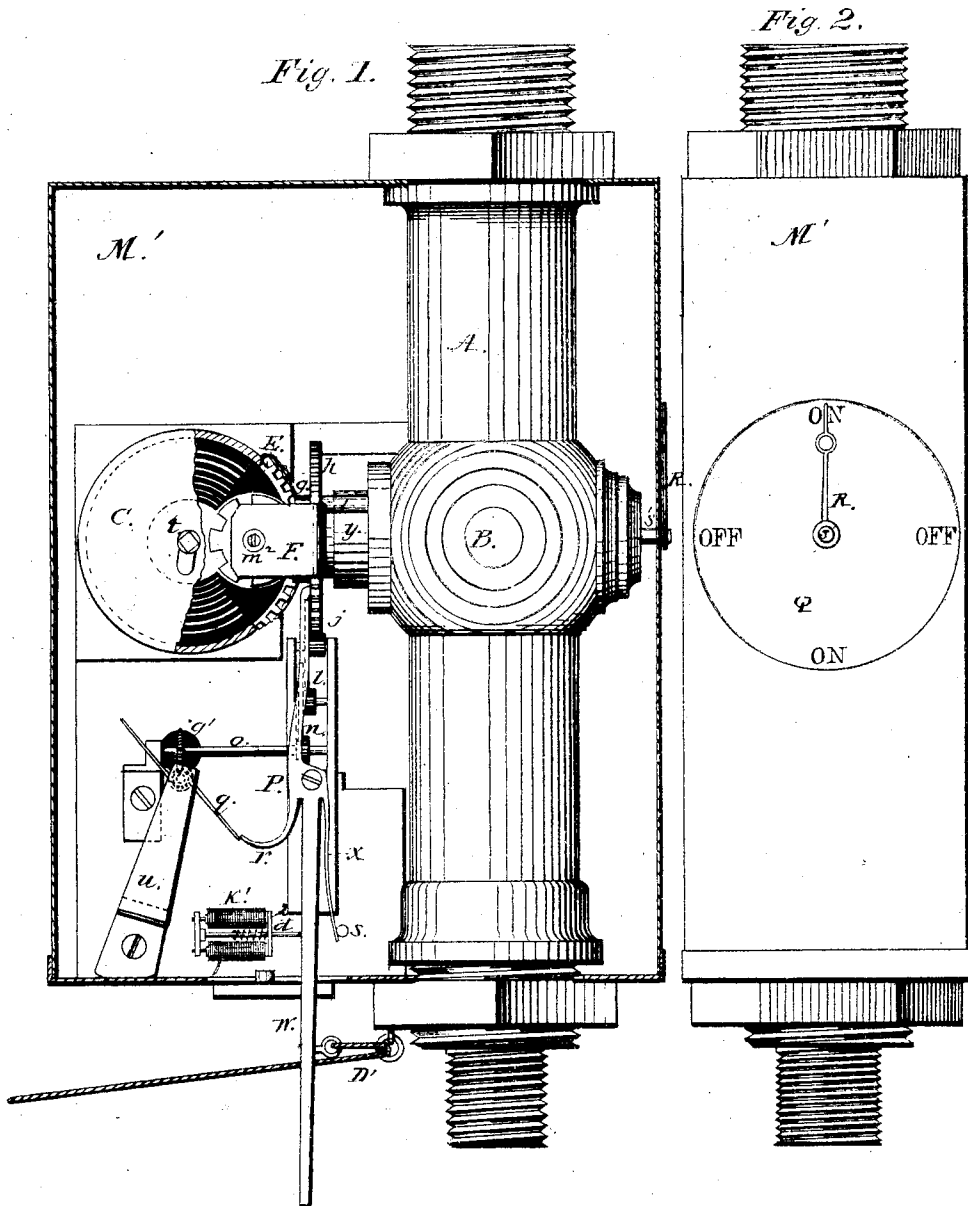


SAMUEL GARDINER, Jr. *Sheet 1-2, Sheets.*

Improvement in Apparatus for Automatically Operating Gas-Cocks.

No. 118,008.

Patented Aug. 15, 1871.



Witnesses:

Edw. W. Donn
Edm. F. Brown.

Inventor:

Saml. Gardiner Jr.
45

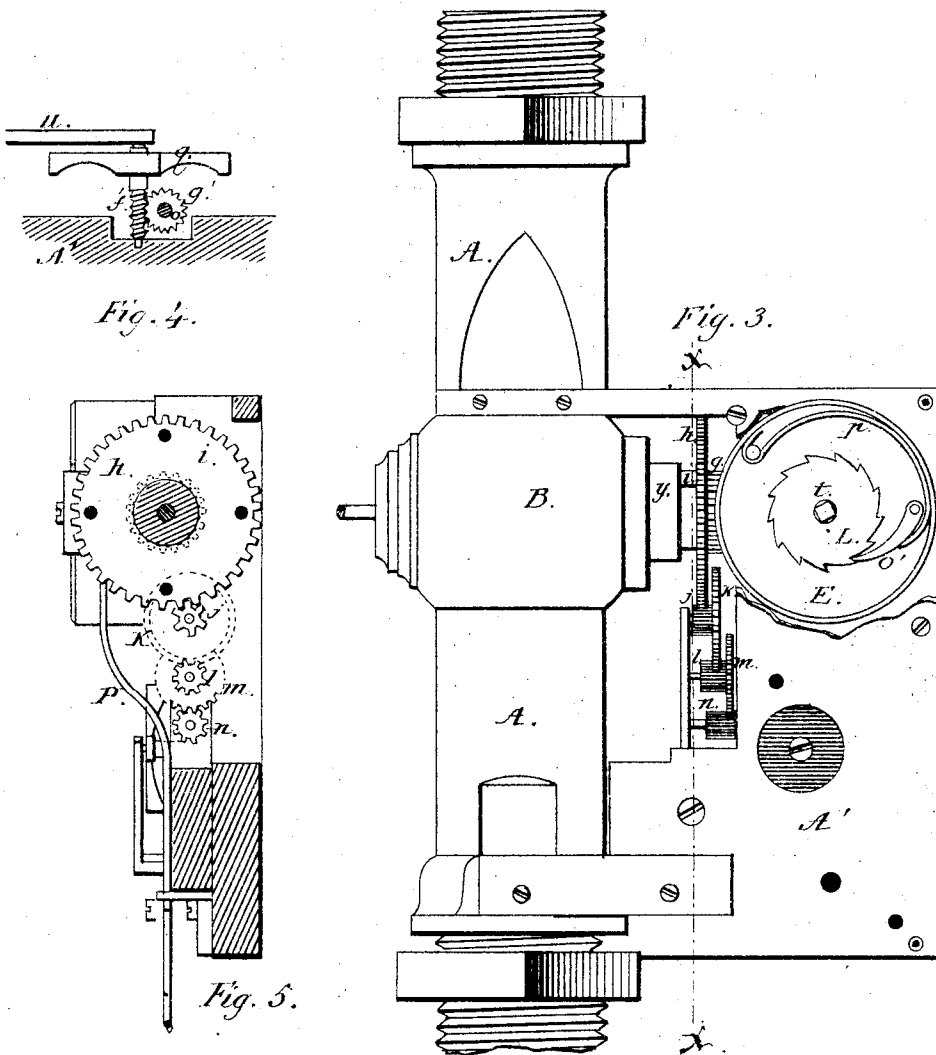
SAMUEL GARDINER, Jr.

Sheet 2 - 2 Sheets.

Improvement in Apparatus for Automatically Operating Gas-Cocks.

No. 118,008.

Patented Aug. 15, 1871.



Witnesses;

Edw. W. Dunn,
Edw. F. Brown.

Inventor;

Samuel Gardiner, Jr.
CH

UNITED STATES PATENT OFFICE.

SAMUEL GARDINER, JR., OF NEW YORK, N. Y.

IMPROVEMENT IN APPARATUS FOR AUTOMATICALLY OPERATING GAS-COCKS.

Specification forming part of Letters Patent No. 118,008, dated August 15, 1871.

To all whom it may concern:

Be it known that I, SAMUEL GARDINER, JR., of the city, county, and State of New York, have invented certain Improvements in Machines for Turning On and Off Gas, of which the following is a specification:

My invention relates to an arrangement for turning cocks to gas-pipes by an electro-magnet, or by a power applied directly or indirectly upon the lever of the device to accomplish the same end. To a plate of brass or other metal I attach a barrel incasing a volute spring, such as is used in clocks or watches. This spring I attach, at its inner end, to the shaft or arbor which forms the axis to the barrel, and at its outer end to the side of the barrel itself. A toothed wheel is secured firmly to the shaft or arbor and forms one of the heads of the barrel containing the volute spring. On the back of the toothed wheel is a ratchet-wheel, which is firmly attached to the shaft or arbor and moves with it. A pawl, attached to the toothed wheel by a pin on which it swings, has bearing against it a spring secured opposite, on the wheel, to keep it bearing against the ratchet-wheel. The pawl moves on the serrated periphery of the ratchet when the spring is being wound up, and prevents the spring from unwinding, except by moving the whole system of gearing. The wheel which forms one of the heads of the barrel gears into a pinion on a wheel attached to a gas-cock by a pin. The axis of the gas-cock and pinion are in common. The wheel with the pin attached engages a pinion on a smaller wheel and compels this wheel to move and engage a pinion on a still smaller wheel. This wheel engages a pinion attached to a shaft which has at its other end a toothed wheel working into a screw-pin which drives a fly or balance-wheel to regulate the speed or movement of the train of wheels. The wheel attached to the gas-cock has drilled through its face, at equidistant intervals, four holes. A stop-bar is secured by a screw to the elevated portion of the plate, which forms a base to the device, and has its end bent and pointed to fit in the holes formed in the wheel attached to and moving with the cock. At the other end of the stop-bar is a spring which bears against a pin in the base-plate. This spring serves to press the bent point of the stop-bar into the holes in the wheel to stop the movement of the device at proper intervals. A screw

attaches the stop-bar to the base and serves as a fulcrum to the lever of the bar. The stop-bar has one of its parts extending below the base-plate, and forms the long arm of the lever. An electro-magnet is placed near the long arm of the lever or stop-bar and operates to draw the lever-arm toward it as the current of electricity is allowed to influence the magnet. The end of the lever-arm serves the purpose of an armature. A hook curving from the stop-bar extends toward the fly-wheel or regulator and stops the same when the point of the stop-bar enters one of the holes of the wheel having its face perforated. By this arrangement the strain which would otherwise fall to the point of the stop-bar is felt proportionately at the fly-wheel and the point of the stop-bar. The small plate screwed to the front head of the barrel and bent at right angles over the perforated wheel tends to keep the cog-gearing in its proper place and prevents any binding pressure against the stop-cock. The wheel immediately under this plate has working between its teeth, as the spring is wound up, the dog which turns on the arbor or shaft which winds the spring, and at each revolution it enters these spaces successively until it reaches the blank half of the periphery. The volute spring is so adjusted that, when the dog reaches the blank, it has received all the winding necessary, and, as the blank prevents further winding, it is impossible for a person to injure the machinery by winding too tight. This device, in the reverse movement, also prevents the spring from opening beyond a certain point. At the end of the stop-cock is a hand or indicator, which is attached to and moves with the same to show on the face of the dial when the gas is on and off.

I have hereinbefore mentioned that the electro-magnet is placed at the end of the stop-bar to draw it forward and thus release the point from the perforated wheel; but instead of this I prefer to have the magnet placed as seen in Fig. 3 of the drawing, as it makes a more compact arrangement. In this case the magnet has an indirect action to press instead of drawing the lever or stop-bar. A bell-pull arrangement may be substituted, if necessary.

Figure 1 is a section through the case, and exposing to view the front of the device. Fig. 2 is an end view, showing the dial, indicator, &c. Fig. 3 is a back view without the case. Fig. 4

is a detached view of the fly-wheel and screw-pinion working into the small toothed wheel. Fig. 5 is a section on line *x x*.

Similar letters of reference are used in corresponding parts in all the figures.

C is the drum which incases the volute spring D. E is the wheel which forms one head of the drum, and has on its inner edge teeth to gear with the pinion *g*. L is the ratchet-wheel on the back head of the drum, to prevent a return movement of the volute spring D, and which, with the pawl *o'* and spring *p*, keeps the spring to its proper tension. *t* is the arbor or shaft, to which is attached the inner end of the volute spring. The ends of the arbor are made square to receive the key which winds up the spring. *h* is a toothed wheel which engages the pinion *j*. On the shaft with the pinion *j* is a toothed wheel, *k*, which engages the pinion *l*. On the shaft with the pinion *l* is the wheel *m*, which gears with the pinion *n* on the shaft *o*. At the end of the shaft *o* is a wheel, serrated in its periphery so as to work into the screw-pinion which is at right angles to the shaft *o*. The screw-pinion is marked *j'*, and the wheel which drives the same *g'*. *q* is the fly-wheel on the shaft of the screw-pinion, which regulates the movement of the machinery. *u* is the arm which forms a support to the shaft of the screw-pinion, while the other bearing is found in the base-plate. *p* is the stop-bar or lever, having its fulcrum at the screw *v*. This stop-bar has its upper point *j'* bent and pointed, so that it may slip into one of the four holes in the wheel *h* at the proper time to check the movement of the stop-cock. The lever-arm *w* is extended below the case, so that, if desirable, the bell-pull arrangement at D' may be used to start the cock. K is a small electro-magnet placed within the case and attached to the base-plate. An armature, attached to a rod which passes between the helices of the magnet, is drawn toward the same when the current of electricity is supplied, which causes the rod *d*² to press against the lever-arm and releases the wheel *h*. The stop-bar or lever has the curved hook *r*, which is intended to strike the balance-wheel *q* at the same time that the point of the stop-bar enters one of the holes in the wheel *h*. The spring *x'*, which bears against

the pin *s*, serves to press the bent point of the lever or stop-bar into the holes in the wheel *h* when the long arm of the lever is released. The pin *i* is riveted to the wheel *h* and connects the stop-cock to this wheel. B is the joint of the pipe containing the stop-cock. A is the gas-pipe, which has screw-threads at either end to receive the nuts which are screwed on when the device is fixed in the case M'. S' is the pin secured to the plug of the gas-cock, and on which is fixed the hand R, which moves over the dial to indicate when the gas is on and off. F is the plate which is screwed to the head of the drum C by the screw *m*², having one end bent at right angles over the wheel *h*, to hold it firmly in its place and prevent any undue binding of the plug of the gas-cock by the pin *i*, which bears against the same.

With this invention I find that a large number of gas-cocks could be operated with but a small amount of battery-power. The apparatus, being small and compact, would be of very great convenience in some places where it might be applied. The whole power of the spring, or weight which might be substituted for the spring, is applied directly to the plug or stop-cock. Another advantage is found in the length of time that the apparatus will run after being wound up. After once winding, this device of mine would turn on and off the gas for four weeks, which is about as often as lamp-cleaners for street-lamps are required to rub off the glass of the lamps.

I claim—

1. The lock-bar P, with its hook *j'*, spring *x'*, and curved hook *r*, in combination with the wheel *h*, having four or more holes upon its face, and the stop-cock, as and for the purpose set forth.

2. The arrangement of the lock-bar P, stop *r*, fly *q*, screw-pinion *j'*, as and for the purpose set forth.

3. The arrangement of the electro-magnet K, pushing-bar *d*, and stop-bar *p*, as and for the purpose set forth.

4. The combination of the bent plate F with the wheel *u*, as and for the purpose set forth.

Witnesses: SAML. GARDINER, Jr.

EDW. W. DONN,

EDM. F. BROWN.