

G. L. HOGAN.

ELECTRIC GAS LIGHTER AND EXTINGUISHER.

No. 379,396.

Patented Mar. 13, 1888.

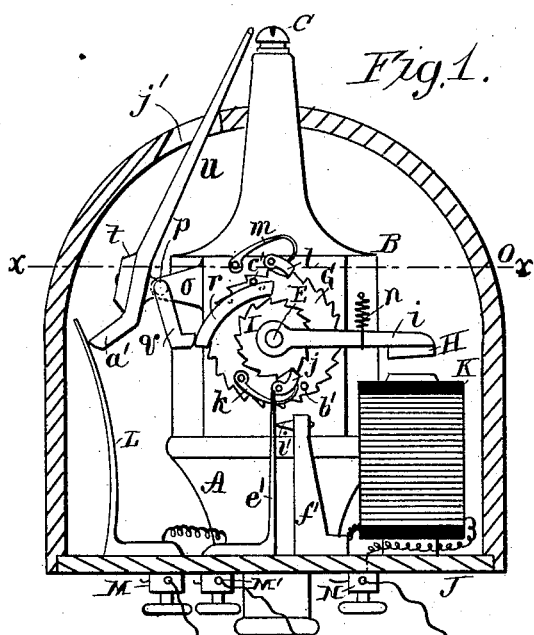


Fig. 1.

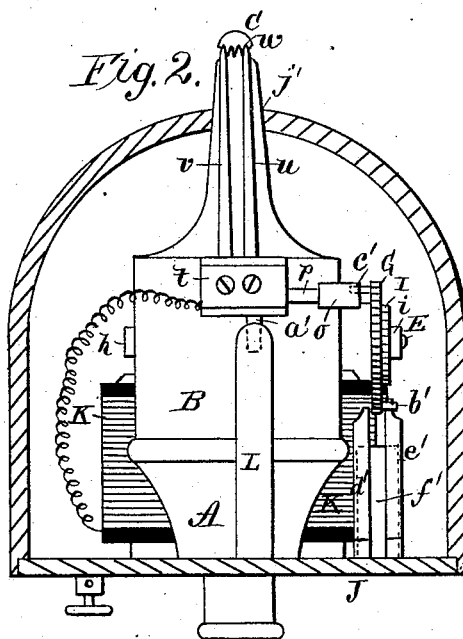


Fig. 2.

Fig. 3.

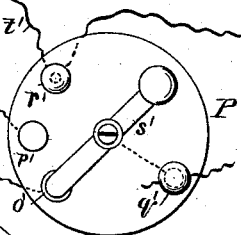
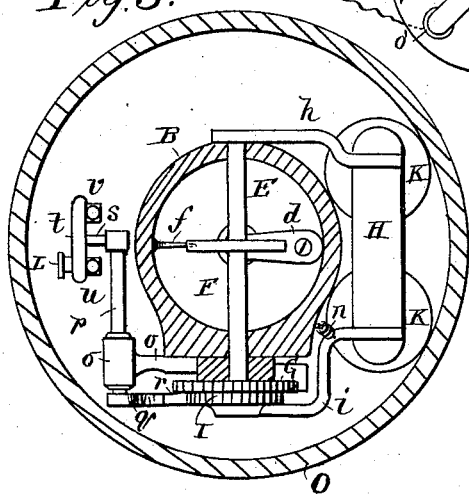


Fig. 5.

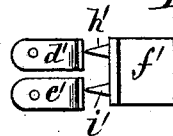
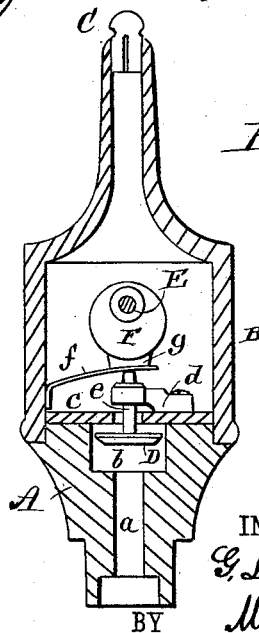


Fig. 4.



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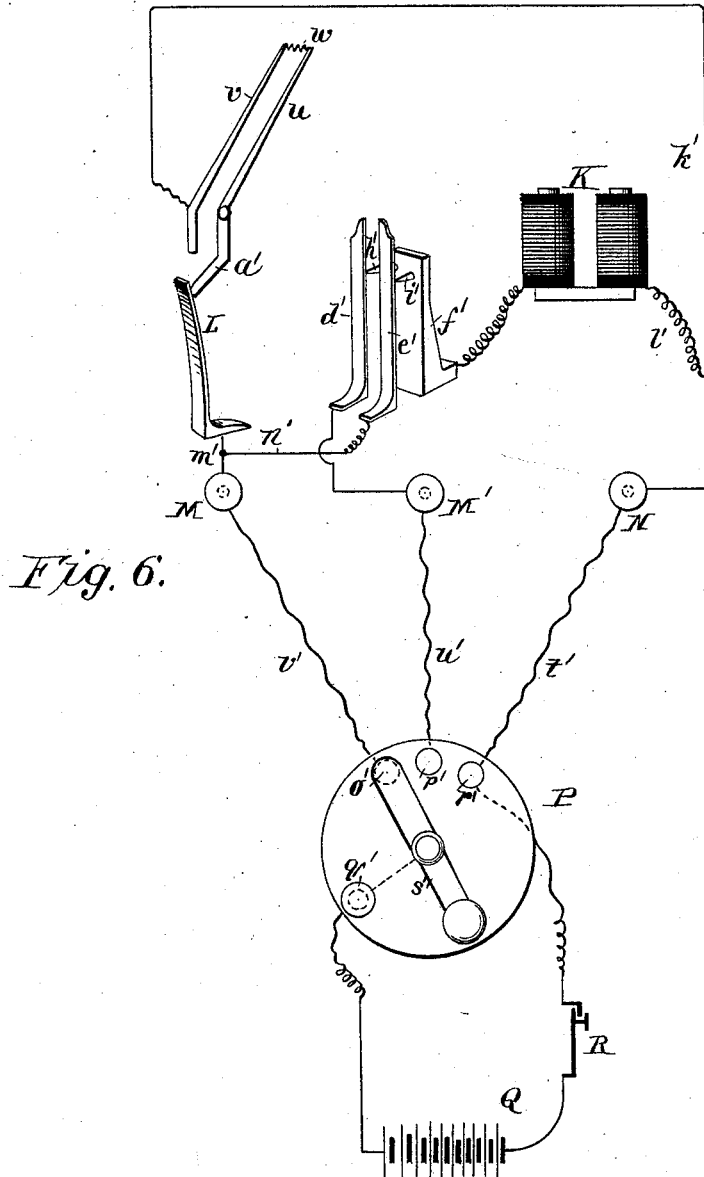
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UNITED STATES PATENT OFFICE.

GEORGE L. HOGAN, OF OLMSTEAD, ASSIGNOR TO HIMSELF, AND BERRY T. CONWAY AND JAMES A. KELLY, BOTH OF LEBANON, KENTUCKY.

ELECTRIC GAS LIGHTER AND EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 379,396, dated March 13, 1888.

Application filed July 2, 1887. Serial No. 243,263. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. HOGAN, of Olmstead, in the county of Logan and State of Kentucky, have invented a new and Improved

5 Electric Gas Lighter and Extinguisher, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a side elevation, partly in section, of my improved gas-lighter. Fig. 2 is a rear view, partly in section. Fig. 3 is a horizontal section taken on line *xx* in Fig. 1. Fig. 4 is a vertical section of the gas burner and valve. Fig. 5 is a detail plan view of the contact-springs, and Fig. 6 is a diagram showing

15 the electrical connections.

Similar letters of reference indicate corresponding parts in all the figures.

The object of my invention is to provide a

20 simple and effective device for turning on gas at a distant point, lighting it, and turning it off through the agency of an electric current, the device to be used for lighting a single lamp or a series of lamps at the same instant and to

25 be used for street or office lighting.

My invention consists in a gas-burner provided with a puppet-valve operated by a shaft and eccentric receiving rotary motion from the oscillating armature of an electro-magnet,

30 the mechanism being adapted to alternately open and close the gas-supply passage.

It also consists in the combination, with the ratchet-wheel secured to the valve-operating shaft, of two pins projecting from opposite

35 sides of the wheel at right angles at diametrically-opposite points and a pair of contact-springs arranged to be operated in alternation by the said pins for breaking the opening and closing circuits when the valve is opened or

40 closed.

My invention also consists in the combination, with the valve and circuit operating mechanism, of a pair of conductors carrying a platinum coil pivoted to the gas-valve casing

45 and acted upon by a cam carried by the ratchet-wheel, so as to push the platinum coil upward into the vicinity of the burner-tip, and at the same time to bring the lower end of one of the conductors against the contact-spring for completing the circuit.

To the base A is secured a cylindrical casing, B, terminating in a burner, C. The lower end of the base A is adapted to receive the gas-supply pipe, and the gas passage *a*, extending through the base, is enlarged near the top of the base, forming a valve-chamber, *b*, which is partly closed by the plate *c*, forming the valve-seat. To the plate *c* is secured an arm, *d*, which is apertured vertically, forming a guide for the stem *e* of the valve D. The valve D is smaller in diameter than the valve-chamber *b*, and is adapted to close the opening in the plate *c*. The upper end of the valve-stem *e*, above the arm *d*, is secured to a flat-spring, *f*, attached to the side of the wall of the casing B and provided with a shoe, *g*.

On a shaft, E, extending through the casing B, is secured an eccentric, F. The eccentric F is arranged to engage the shoe *g* on the spring *f*, so that when the shaft E is turned, in the manner presently to be described, it carries the eccentric F around and presses downward the spring *f*, thus opening the valve D, and the further turning of the eccentric releases the spring *f* and allows it to close the valve D. Both ends of the shaft E are prolonged beyond the side of the casing, and upon one end of the shaft is secured the ratchet-wheel G.

Upon the extremities of the shaft E are pivoted the arms *h i*, which carry the armature H and form the armature-lever. These arms swing loosely upon the ends of the shaft E. To the inner side of the arm *i* is secured a ratchet-wheel, I, whose teeth are oppositely inclined with respect to the teeth of the wheel G. To the ratchet-wheel G is pivoted a pawl, *j*, which is pressed into engagement with the ratchet-wheel I by the spring *k*, secured to the wheel G, and upon the flattened surface of the casing B is pivoted a pawl, *l*, which engages the teeth of the ratchet-wheel G, the said pawl *l* being pressed into engagement with the ratchet-wheel by a spring, *m*. The armature H is maintained in its normal position by a spring, *n*, attached to the casing B and connected with the arm *i*.

To the lower part of the base A is secured a plate, J, which supports an electro-magnet, K, underneath the armature H. To an arm, 100

o, projecting from the side of the casing opposite the armature H, is journaled a rock-shaft, p, carrying at one end an arm, q, which engages a cam, r, carried by the ratchet-wheel G, and is furnished at its opposite end with an arm, s, carrying an insulating-bar, t, to which are attached two conductors, u v. The conductor u is prolonged below the insulating-bar t, and both of the bars u v extend upward parallel with each other to a point opposite the burner C. The upper ends of the conductors u v are connected by a platinum spiral, w. A flat contact-spring, L, secured to the plate J, extends upward into the path of the prolongation a' of the arm u.

In the outer face of the ratchet-wheel G is inserted a pin, b', at right angles to the face of the wheel, and at a diametrically-opposite point is inserted a similar pin, c', in the inner face of the ratchet-wheel G, and to the plate J are secured two contact-springs, d' e', which project upward into the paths of the pins b' c'. Opposite the springs d' e' is supported a post, f', by the plate J, the said post carrying two contact-points, h' i', which normally are touched by the springs d' e'. To the plate J are attached binding-posts M, M', and N.

The mechanism described is inclosed by a cover, O, fitted to the plate J and provided with an aperture, f', through which the parallel conductors u v project.

The electrical connections are as follows: The binding-post N is connected with the wire k', leading to the conductor v, and with one terminal of the magnet K by the wire l'. The remaining terminal of the magnet K is connected with the post f'. The binding-post M' is connected with the spring d', and the binding-post M is connected electrically with the springs L e' by the wires m' n'. At the central station is arranged a switch, P, provided with the contact-points o' p', the binding-posts q' r', and the switch-lever s'. The binding-posts q' r' are connected with the terminals of the battery Q. The binding-post q' is connected with the pivot of the switch-lever s'. The binding-post r' of the switch is connected by a wire, t, with the binding-post N of the distant lamp. The contact-point p' of the switch is connected by a wire, u', with the binding-post M', and the contact-point o' is connected by a wire, v', with the binding-post M of the distant lamp.

The operation of my improved device is as follows: When it is desired to light the lamp, the circuit is closed by pressing the switch-lever s' on the contact o', when the electric circuit is alternately opened and closed by the key R, placed in the circuit, thereby causing the armature H to be alternately attracted and released by the magnet K. Each downward movement of the armature H causes the ratchet-wheel I to turn on the shaft E and by its engagement with the pawl j to move forward the ratchet-wheel G one tooth, and each upward movement of the said armature H (due to the attraction of the spring n) turns the

ratchet-wheel I in the opposite direction, bringing a new tooth into engagement with the pawl j. The next downward movement of the armature carries forward the ratchet-wheel G another tooth, and so on as long as the circuit is complete. During the step-by-step movement of the ratchet-wheel G the cam r is brought into engagement with the arm q and the prolongation a' of the conductor u is brought into engagement with the spring L, causing a part of the current to flow through the said conductor and through the platinum wire w, thereby heating the wire. The motion is thus continued until the turning of the eccentric has opened the valve D and the forward movement of the cam r has carried forward the platinum coil w, bringing it into contact with the escaping gas and igniting it, the said cam r afterward releasing the arm q, allowing the conductors u v to be carried away from the burner by the action of the spring L, until, finally, the pin b' comes into engagement with the spring e', breaking the circuit between the said spring and the contact-point i', projecting from the post f'. When this occurs, the further operation of the magnet through the wire v' is prevented and the valve D remains open, allowing the gas to escape through the burner until it is desired to shut off the gas.

The shutting off of the gas and the extinguishing of the light are accomplished by placing the switch-arm s' on the contact-point p', then making and breaking the circuit by means of the key R, the current flowing through the wire u', binding-post M', spring d', contact-point h', post f', magnet K, wire l', binding-post N, wire t, and binding-post r' back to the battery Q. Each impulse of the current causes the magnet K to attract the armature H and move the ratchet-wheel G and its shaft by a step-by-step movement until the eccentric F has attained a diametrically-opposite position, thereby allowing the valve D to close, as shown in dotted lines in Fig. 4. As soon as the valve is closed, the further movement of the ratchet-wheel G brings the pin c' into contact with the spring d', thereby breaking the circuit and preventing the further movement of the shaft E and eccentric F until it is desired to again turn on and light the gas.

When applied to street or series lamp lighting, the burner is to be fastened onto the gas-supply pipe. The office-connection of the wires is made as above specified. These wires are then passed through the like binding-posts of each burner throughout the whole system. Thus when one lamp is lighted the whole series will be lighted.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In an electric gas-lighting apparatus, the combination, with a burner and a spring-pressed valve therein, of an electro-magnet, an armature supported in the field of the magnet, an eccentric for depressing the valve against

the action of the spring, and intermediate mechanism for operating the eccentric from the armature, substantially as described.

2. The combination, with the valve D, adapted to close on the apertured plate *c*, of the spring *f*, connected with and adapted to close the valve D, the casing B, provided with the burner C, the shaft E, journaled in the casing B, and the eccentric F, mounted on the said shaft, substantially as specified.

3. In an electric gas lighting and extinguishing apparatus, the combination, with the valve-operating shaft E and eccentric F, of the ratchet-wheel G, secured to the said shaft, the ratchet-wheel I, placed loosely on the said shaft, the spring-pressed pawls *j* *l*, the armature-arm *i*, fulcrumed on the shaft E and attached to the ratchet-wheel I, the armature-arm *h*, fulcrumed on the shaft E, the armature H, attached to the arms *h* *i*, the spring *n*, and the electro-magnet K, arranged to act upon the armature H, substantially as specified.

4. The combination, with the electro-magnet K, valve-operating shaft E, and wheel G, provided with pins *b' c'*, of the contact-springs *d' e'*, the contact-points *h' i'*, and the circuit-connections, whereby the circuit through the magnet is broken at each half-revolution of the valve-operating shaft, substantially as specified.

5. The combination, with the burner C and valve operating mechanism connected there-

with, of the swinging conductors *u v*, the platinum coil *w*, carried by the said swinging conductors, the arm *q*, connected with the conductors, the cam *r*, carried by the ratchet-wheel G, and the circuit-connections, substantially as specified.

6. In an electric gas lighter and extinguisher, the combination of the burner C, valve D, eccentric F, shaft E, ratchet-wheel G, carrying the pins *b' c'* and cam *r*, the ratchet-wheel I, arms *h i*, armature H, electro-magnet K, the post *f'*, provided with points *h' i'*, the springs *d' e'*, spring L, conductors *u v*, platinum spiral *w*, carried by the said conductors, and the arm *q*, connected with the conductors *u v* and adapted to engage the cam *r*, and mechanism for opening gas-valve, substantially as specified.

7. In an electric gas-lighting apparatus, the combination, with an electro-magnet, K, of the igniting-wire *w*, intermediate connections between the said wire and magnet, and the binding-posts M, M', and N, the switch P, the battery Q, with which the switch is connected, the key R, arranged between the battery and switch, and the wires *t' u' v'*, leading from the switch to the binding-posts N M' M, respectively, substantially as described.

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Witnesses:

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