

(No Model.)

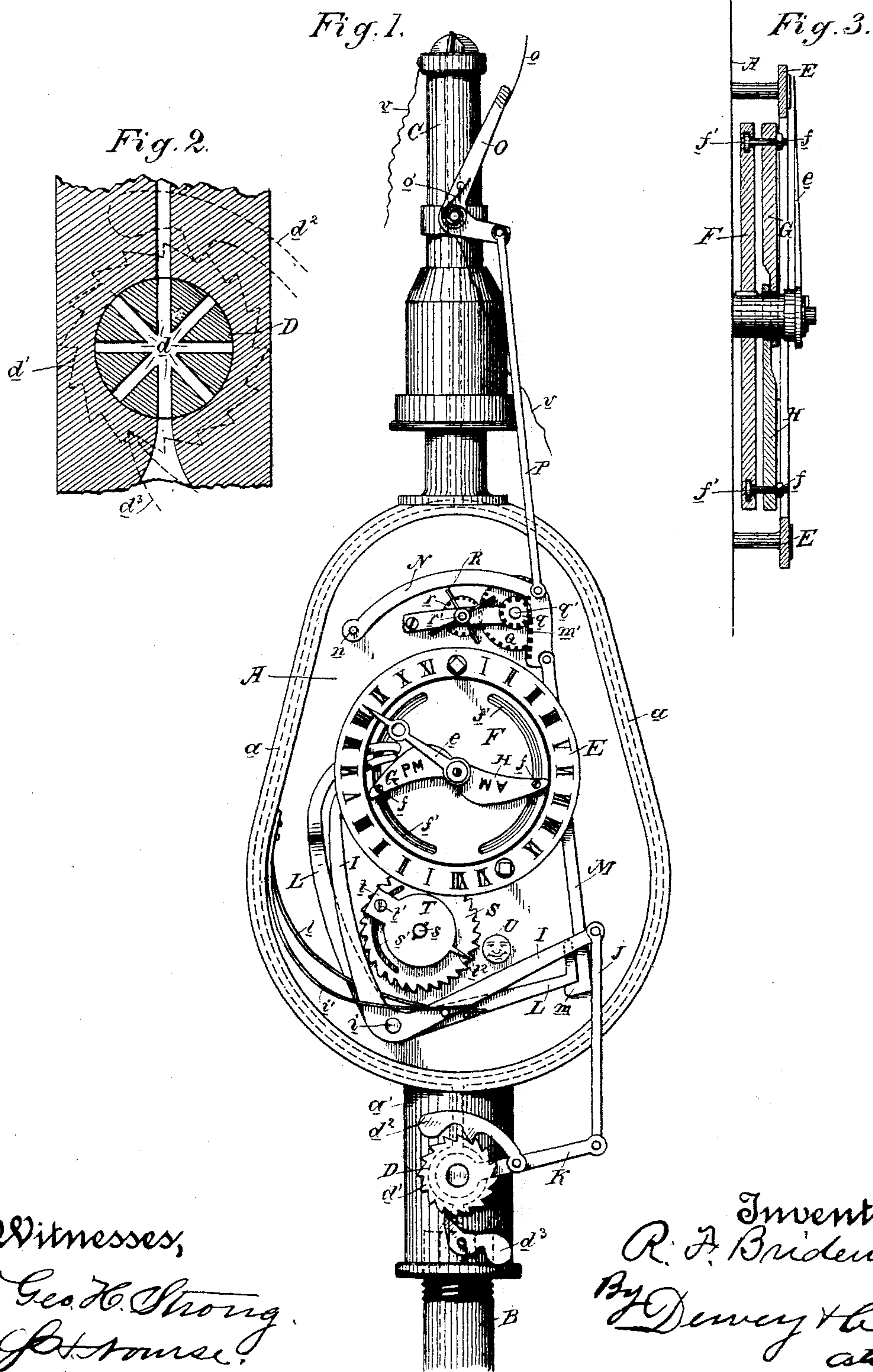
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R. F. BRIDEWELL.

AUTOMATIC GAS LIGHTING AND EXTINGUISHING DEVICE.

No. 388,177.

Patented Aug. 21, 1888.



Witnesses,
Geo. H. Strong.
J. H. House.

Inventor,
R. F. Bridewell.
By Dewey & Co.
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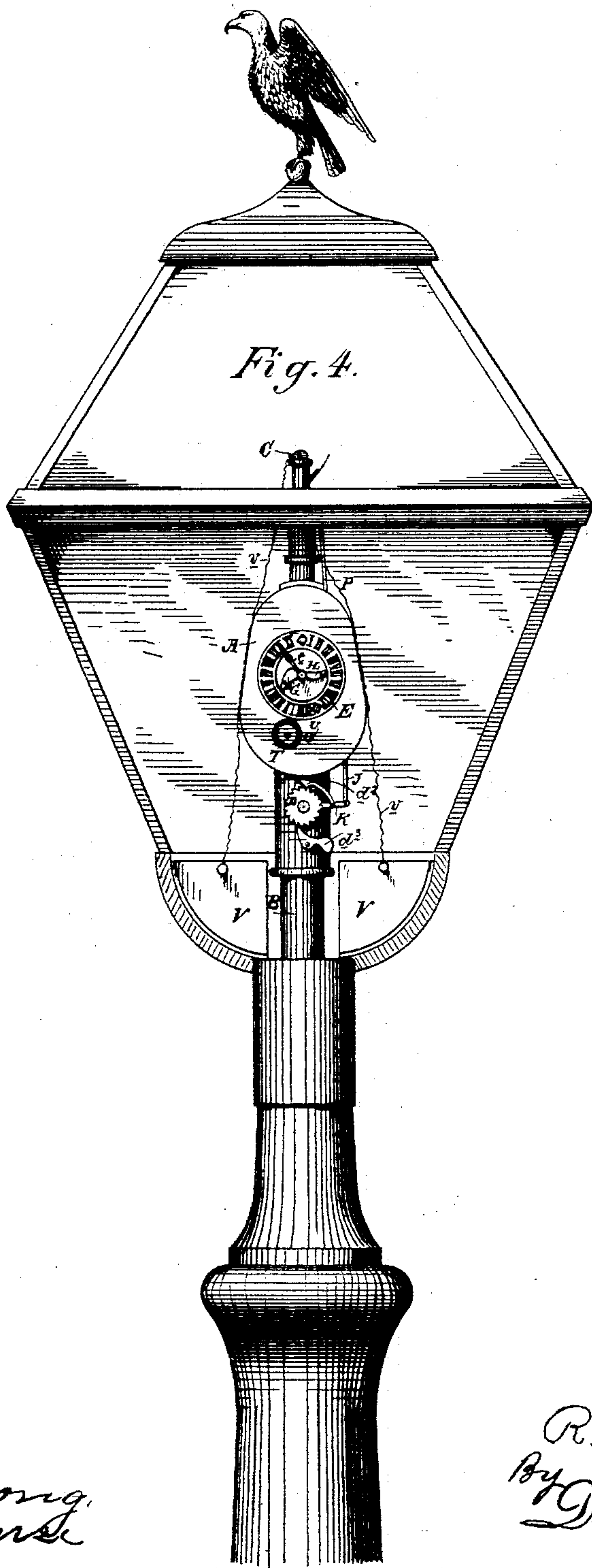
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UNITED STATES PATENT OFFICE.

RICHARD F. BRIDEWELL, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY
DIRECT AND MESNE ASSIGNMENTS, OF TWO-THIRDS TO HENRY H. ALLEN
AND MARY PENDERGAST, OF SAME PLACE.

AUTOMATIC GAS LIGHTING AND EXTINGUISHING DEVICE.

SPECIFICATION forming part of Letters Patent No. 388,177, dated August 21, 1888.

Application filed July 23, 1887. Serial No. 245,141. (No model.)

To all whom it may concern:

Be it known that I, RICHARD F. BRIDEWELL, of the city and county of San Francisco, State of California, have invented an Improvement in Automatic Gas Lighting and Extinguishing Apparatus; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of gas lighters and extinguishers; and my invention consists in the constructions and combinations, which I shall hereinafter fully describe and claim.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a front elevation of my apparatus. Fig. 2 is a cross section of the valve D. Fig. 3 is a section through the dial and wheel F. Fig. 4 is an elevation showing the battery and circuit.

A is a shell or casing having in its walls the passages *a* for the gas. The lower ends of these passages communicate with the pipe *a'*, which communicates with the gas-inlet pipe B, and the upper ends of said passages communicate with the burner C. The pipe *a'* is controlled by a valve, D, which is made cylindrical in cross-section, and is horizontally arranged in its seat transversely of the pipe.

The cylinder is provided with diametrically-arranged ports *d*, which, by the rotation of the valve, are adapted to be successively brought into alignment with the hole in the pipe, thereby opening the gas-communication, the space between these ports serving to cut said communication off.

The projecting end of the valve D is provided with a ratchet, *d'*, which is actuated by a pawl, *d''*, and is held in place by a retaining-pawl, *d'''*. Upon the face of the shell or casing A is made a dial, E, over which a hand, *e*, moves, and within the center of the dial is mounted upon the hand-arbor a disk or wheel, F. Pivoted upon said arbor are also the oppositely-arranged cams G and H, said cams being adapted to be set in any required position on the face of the wheel F by means of set-screws *f*, which pass through the cams and into curved slots or grooves *f'* made in the face of the wheel F.

Pivoted to the face of the casing A at the point *i* is an elbow or bell-crank lever, I, the vertical arm of which is in the path of the cams G and H, and is adapted to be operated thereby. The horizontal arm of said lever is connected with a link, J, the lower end of which is connected with a pivoted arm, K, to which the actuating-pawl *d''* is attached. Pivoted also at *i* is a second elbow or bell-crank lever, L, the vertical arm of which is also in the path of the cams G and H, though at a point higher up. The horizontal arm of said lever rests on a shoulder or offset, *m*, on the lower end of a connecting-link, M, the upper end of which is connected with one end of a curved lever, N, which is pivoted at the point *n*.

O is the pivoted lever on the burner, which carries the sparking-point *o*, by which the gas is lighted. One end of the lever O has connected with it a link, P, the lower end of which is pivoted to the curved lever N. A spring, *i'*, is connected with the bent lever I in such a way that its tendency is to throw the horizontal arm of said lever downwardly, and a spring, *l*, is so arranged in connection with the bent lever L that its tendency is to throw the horizontal arm of said lever downwardly. A spring, *o'*, is arranged in connection with the sparking-lever O in such a way as to throw its horizontal arm upwardly, whereby its sparking-wire is kept away from the burner.

Within the casing A is arranged a clock-work mechanism, which I have deemed unnecessary herein to show, as it may be of any suitable character. I have, however, in Fig. 4 shown the electric battery V and the electric circuit *v*, which includes the sparking-lever.

The operation of the device as far as described is as follows: The clock mechanism is arranged to turn the hand *e* through a complete revolution in twenty-four hours, and, as the disk or wheel F is mounted on the hand-arbor, said wheel is also turned around in twenty-four hours. The cams G and H are set properly on the wheel F by means of their set-screws *f*, so that their points indicate on the dial E the proper time.

For the purposes of this description I will

say that the cam G is the one by which the gas is lighted, and the cam H that by which it is extinguished. When the cam G in its rotation reaches the vertical arm of the lever I, which stands in its path, it forces said arm backwardly, thereby turning the lever on its pivot, so that its horizontal arm rises, which movement through the link J and arm K moves the pawl d^2 over, causing it to slip one tooth on the ratchet d' on the valve D. As soon as the cam G relieves the lever I, the spring i' of said lever throws its horizontal arm down, thereby, through the link J and the arm K, bringing forward the pawl d^2 , which turns the valve D, so that one of its ports is in line with the hole in the pipe a' , thereby opening the gas-communication and holding it open. The gas thereupon passes up through the passages a to the burner. The cam G in its revolution at the same time that it is operating the lever I also comes in contact with the interrupting end of the lever L, thereby forcing it back, so that its horizontal arm relieves the link M and the link P, so that the spring o' of the sparking-lever operates to throw said lever backwardly to position. As the cam relieves the lever L the spring l of said lever throws it back, so that its horizontal arm bearing down on the shoulder m of the link M brings said link and the link P down, which movement throws the sparking-lever over, so that its contact-point o passes over the burner part, thereby lighting the gas.

To make this part of my invention more clear I will state that in Fig. 1 the sparking-lever O is shown in its normal position, with its spring o' tending to throw said lever over to the left of the burner. This tendency, however, is resisted by the bell-crank lever L, whose spring l keeps the horizontal arm of the lever down against the shoulder or offset m on the lower end of the link M. Now, when the cam G moves around and contacts with the vertical arm of the lever L, the horizontal arm of said lever relieves the link M, thereby permitting the spring o' to throw the sparking-lever to the opposite side of the lever, or to a position to the left of that shown in Fig. 1. The spring o' keeps the sparking-lever in this latter position until the cam G relieves the lever L, when the spring l , acting upon the said lever, throws the horizontal arm down upon the shoulder or offset m of the link M, which movement, through the medium of the links M and P, quickly throws the sparking-lever back to the position shown in Fig. 1, the said lever in its movement past the burner lighting the gas.

The movement of the sparking-lever to the left of the burner is for the purpose of getting it into a position where the link M may be readily engaged by the lever L when the latter is relieved by its cam, and also to permit said lever and its adjuncts to be operated during the movement of the lever which controls the gas-communication.

It will also be observed that the lever L is so

arranged with relation to the lever I that it is relieved shortly after the lever I is relieved, which gives sufficient time for the gas to reach the burner before the sparking-point moves across it. The apparatus remains in this position until the cam H comes around and operates the lever I, so that through its connecting mechanism the valve D is turned to close off the gas.

In order to prevent the spring l , which throws the lever L to position, from bringing the links M and P down with a jerk, and to avoid a too rapid movement of the sparking-lever, which would be occasioned by such a jerk, I have connected the links M and P with the curved lever N. The inner face of said lever for a certain distance from its end I make with teeth m' , which mesh with a pinion, q , on a shaft, q' , which carries a large gear, Q, which meshes with a pinion, r , on a shaft, r' , which carries a fan, R. By this gearing the movement of the lever N is retarded sufficiently to prevent the spring l from forcing it down too suddenly.

In cities where the gas is not lighted when the moon is full, or is just approaching or past it, I provide for rendering the mechanism inoperative during said period by the following means:

S is a gear-wheel which is driven suitably by the clock mechanism, and is on a short shaft or pin, s , on which is loosely pivoted a disk, T, having a projecting lug, t , which is adapted to come in contact with both the levers I and L. The disk T is set in any desired position by means of a set-screw, t' , which passes through the lug t and into a curved slot or groove, s' , made in the gear S. In order to facilitate the adjustment of the disk T, I have on the face of the casing A the representation of the full moon, (here designated by U,) and projecting from the periphery of the disk T is a pointer, t^2 . Now when the disk is turned so that the pointer is turned toward the representation of the full moon, the lug t of said disk is brought in such a position with relation to the levers I and L as to come in contact with said levers and force them back out of the path of the cams during the required period in which the gas is to remain unlighted. The clock-work mechanism inside of the casing A is preferably so arranged as to run for a calendar month, in which case it is obvious that the wheel S should be so geared up as to make its revolution in twenty-eight days, to correspond with the lunar month.

I do not wish to confine myself to the use of electricity for the lighting, as mechanical devices may be employed which can be operated by the movement of the levers.

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

1. In a gas lighter and extinguisher, the burner, the valve controlling the admission of gas to the burner, a pivoted lever, and connections with the valve for operating it, in com-

5 bination with a lighting apparatus for lighting the gas at the burner, a pivoted spring-actuated lever and connections with the lighting apparatus for operating it, and the rotary
cams for operating the two levers successively, whereby the gas is turned on and off at the valve and lighted and extinguished at the burner, substantially as described.

10 2. In a gas lighter and extinguisher, the burner, the valve controlling the admission of gas to the burner, a pivoted lever, and connections with the valve for operating it, a lighting apparatus for lighting the gas at the burner, a pivoted lever, and connections with the lighting apparatus for operating it, and a spring
15 engaging said lever, in combination with a rotary cam for operating the two levers successively, whereby the gas is turned on at the valve and lighted at the burner, and a second
20 succeeding rotary cam for operating the first lever, whereby the gas is turned off at the valve and extinguished at the burner, substantially as described.

25 3. In a gas lighter and extinguisher, a burner and a pivoted electrical sparking-lever, and an actuating spring for said lever, in combination with rotating cams and pivoted bell-crank lever, one end of which is in the path of said
30 cams, whereby it is operated, a spring actuating said bell-crank lever, a pivoted curved lever having rack-teeth, and gearing with which it meshes to regulate its movement, a link connecting the bell-crank lever with the curved
35 lever, and a link connecting said curved lever with the sparking-lever, substantially as herein described.

4. In a gas lighter and extinguisher, the burner, a rotary valve controlling the admission of gas to the burner, and a pivoted electrical sparking-lever having a spring to return
40 it to position, in combination with succeeding rotary cams, independent bell-crank levers having each one end in the path of the cams, whereby each is operated successively by each
45 cam, springs for returning levers to position, a pawl-and-ratchet mechanism for operating the valve, connecting levers and links between said mechanism and one of the levers, and connecting-links between the other of said levers
50 and the sparking-lever, substantially as described.

5. In a gas lighter and extinguisher, the burner, a rotary valve controlling the admission of gas to said burner, and a pivoted electrical sparking-lever having a spring to return
55 it to position, in combination with succeeding

rotary cams mounted adjustably, a fixed dial by which said cams are accurately adjusted, independent bell-crank levers having each one
60 end in the path of the cams, whereby each is operated successively by each cam, springs for returning the levers to position, a pawl-and-ratchet mechanism for operating the valve, connecting-levers and links between said mechanism and one of the levers, and connecting-
65 links between the other of said levers and sparking-lever, substantially as described.

6. In a gas lighter and extinguisher, a burner, a gas-conduit, a valve by which the admission of gas to the burner is controlled,
70 and an electrical sparking-lever for lighting the burner, in combination with a fixed dial and a hand moving over said dial to indicate the time, a wheel moving with the hand, cams adjustably secured to the wheel, pivoted levers
75 operated by the cams, and connections from said levers by which the valve and the sparking-lever are operated, substantially as herein described.

7. In a gas lighter and extinguisher, a
80 burner, a casing having passages for the gas in its walls, and a pipe communication at the bottom of said passages, and a burner at the top, in combination with the rotary valve controlling the inlet of the gas, the sparking-lever for
85 lighting the gas at the burner, rotary adjustable cams on the face of the casing, the fixed dial, whereby the cams may be adjusted to the proper time, the pivoted levers operated by the cams, and connections between said levers
90 and the valve and sparking-lever, substantially as herein described.

8. In a gas lighter and extinguisher, a burner, a gas-conduit, a valve controlling the admission of gas to the burner, and an electrical sparking-lever for lighting the gas at said
95 burner, in combination with rotary cams, pivoted spring-actuated levers operated by said cams, connections from said levers to the valve and sparking-lever, whereby they are operated,
100 and the adjustable rotary disk T, having the lug t, adapted to come in contact with the levers, whereby they are held out of position during any given period, substantially as
105 herein described.

In witness whereof I have hereunto set my hand.

RICHARD F. BRIDEWELL.

Witnesses:

THOS. PENDERGAST,
WM. F. BOOTH.