W. C. CUTLER.

Electric Gas-Lighting Device.

No. 220,704. Patented Oct. 21, 1879.

FIG 1.

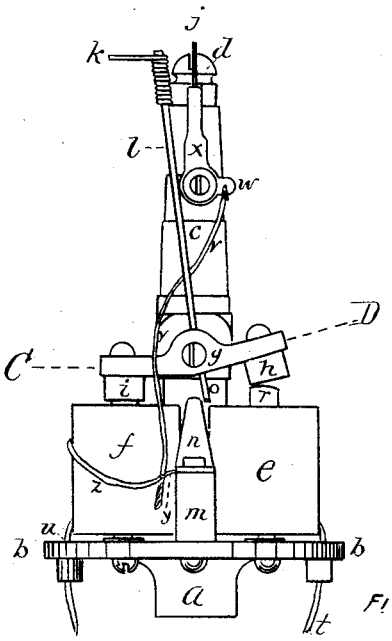


FIG 2.

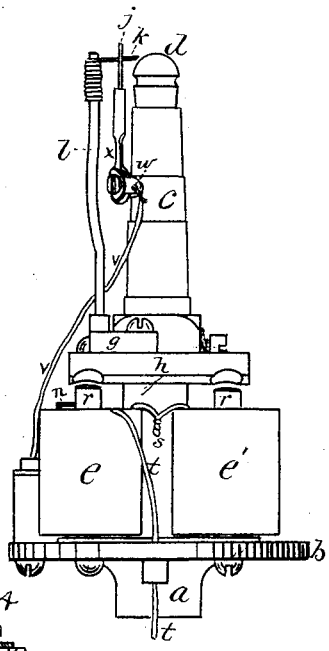


FIG 4

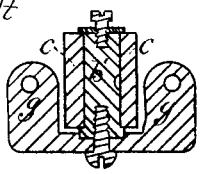
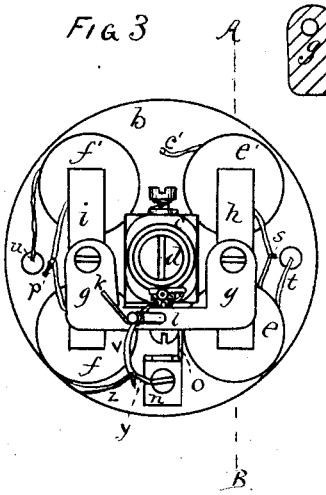


FIG 3



WITNESSES

Samuel D. Kelley.

George B. Haskell.

INVENTOR.

William C. Cutler

By Porter & Hutchinson

Attys

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM C. CUTLER, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN ELECTRIC GAS-LIGHTING DEVICES.

Specification forming part of Letters Patent No. **220,704**, dated October 21, 1879; application filed July 5, 1878.

To all whom it may concern:

Be it known that I, WILLIAM C. CUTLER, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Electric Gas-Lighting Apparatus, of which the following is a specification.

This invention relates to that class or kind of gas-lighters which are arranged to open the gas cock or liberate the gas by the same movement which produces or generates the igniting-spark; and the invention consists in combining with the gas-burner one or more electro-magnets on each side of such burner, with a rocking bar attached to the gas-cock, by which to rotate the cock to a limited extent, an armature being secured to each end of said bar, and respectively arranged over the poles of the magnets on each side of the burner, so that as the magnets on either side of the burner are rendered operative the corresponding armature will be thus drawn downward, thereby actuating the rocking bar and rotating the gas-cock, thereby, as the respective magnets are made active, alternately opening and closing the cock, the vibrating igniting-point being secured in and actuated by such rocking bar, and a short arm or finger being also secured in the rocking bar, and arranged to make and break ground-contact with an insulated point which is connected with the wires, whereby when the said arm is vibrated in one direction, or when the gas-cock is being closed, no electric spark will be generated, but when operated in conjunction with the movement for opening the gas-cock the ground-contact will be broken in time to generate the electric spark to ignite the gas.

Figure 1 is a front elevation of a gas-burner with my invention applied thereto. Fig. 2 is a side elevation thereof as viewed from the right of Fig. 1. Fig. 3 is a top or plan view. Fig. 4 is a horizontal section taken on line C D, Fig. 1, transversely to the burner, and in longitudinal section to the gas-cock and rocking arm.

In these drawings, *a* represents the base or lower end of the burner *c*, which base is formed, in the usual manner, with an interior or female thread for attaching it to the gas-pipe. *b* is a circular flange, which is secured to or formed as a part of the burner. In the upper portion of the burner the usual tip *d* is inserted.

x is a fixed arm, insulated and secured to burner *c*. In this arm is secured the fixed igniting-tip *j*, which is arranged at or near one end of the slit or gas-passage in tip *d*.

The vibrating point *k* is coiled upon and actuated by the vibrating arm *l*. *e* and *e'* are two coils constituting an electro-magnet secured to base *b* on one side of burner *c*, and *f* and *f'* are similar coils or a magnet secured to this base on the opposite side. The coils *e* and *e'* are united, as shown at *s*, and the conducting-wire *t* thereof passes through insulation in bed *b*, as shown, and is arranged to connect or disconnect with the battery, in the usual manner. The coils *f* and *f'* are united, as shown at *p*, and pass by insulation through the base, as shown at *u*, and are also arranged to connect or disconnect with the battery, in the usual manner.

A wire, *z*, of magnets *f f'* connects with wire *v*, which latter is connected at *w* with the insulated fixed arm *x*, and with wire *y*, which connects with the arm *n*, insulated upon block *m*, as shown.

g is the rocking lever, rigidly secured to gas-cock *b'*, and *h i* are armatures secured to the respective arms of the lever, and respectively over the poles of the magnets, as shown.

The vibrating arm *l* is secured in and actuated by the rocking lever as the same is tilted. A small angle-arm, *o*, is also secured in the under side of the lever, and is, in a reverse direction, actuated thereby; and when the lever is in the position shown in Figs. 1 and 2, the angle-arm *o* is disconnected with arm *n*; but when the position of the lever is reversed, by vibrating it to the right, then arm *o* is in contact with *n*, and thereby, through the agency of wire *y* and the cock *b'*, ground-contact is formed.

In Figs. 1, 2, 3 the positions of the parts are shown as when the gas is turned on and ignited, and the armature *i* drawn down by and upon magnet *f* and *f'*.

When it is desired to extinguish the light, wire *t* is connected with the battery, thereby rendering magnet *e* and *e'* active, when arma-

ture *h* will be attracted and drawn down to the magnet, thereby not only vibrating arm *l* to the right of arm *x*, as before described, but also rotating the gas-cock and shutting off the flow of gas. When the gas is thus shut off, point *o* will be in contact with arm *n*, so that when it is desired to ignite the gas a circuit will be maintained by means of the ground-contact thus formed; and as the point *k* will be brought in contact with point *j* before that of *o* and *n* is broken, therefore the circuit will be maintained until the breaking of contact of points *k* and *j*, which breaking will generate the electric spark and ignite the gas, the gas-passage through the cock being opened, by the means described, before such spark is generated.

Ground-contact is maintained with coils *e* and *e'* by wire *c'*, which is permanently connected with base-flange *b*, thereby securing a circuit for the current through these coils when they are rendered active.

I do not claim the combination of the fixed or rigid point *j* and the elastic or yielding point *k*, as the same have been before known and used; nor do I claim any of the constituent parts employed in my invention, but only the specific combinations and arrangements of such parts, as the same are shown in the drawings, described and pointed out in the specifications, and specified in the following claims:

1. In combination with a gas-burner, *c*, provided with an insulated fixed igniting-point, *j*, and a gas-cock, *b'*, a rocking lever, *g*, rigidly secured to and arranged to actuate such cock, and having armatures *h i* secured to its respective ends, and arranged in combination with independent electro-magnets *e f*, which, as they are respectively rendered operative by the electric current, alternately vibrate such lever in opposite directions through their action on the armatures, and thereby turn on or shut off the gas by so actuating the cock, and simultaneously with such movement of the cock vibrate an arm, *l*, carrying a contact-point arranged to generate an electric spark by its contact with the fixed point after the gas shall have been liberated by the described movement of the cock, all substantially as specified.

2. In combination with burner *c*, provided with its tip *d*, insulated fixed point *j*, and rotating cock *b'*, the rocking lever *g*, rigidly secured to such cock, the armatures *h i*, secured to the respective arms of such lever, electro-magnets *e f*, the vibrating lever *l*, with its elastic contact-point *k*, and secured in and actuated by lever *g*, arm *o*, also carried by such lever, and the insulated contact-arm *n* for making and breaking contact, all substantially as specified.

3. In combination with gas-burner *c*, with its igniting-points, and the cock-actuating lever *g*, the vibrating arm *o*, secured to and actuated by such lever, and the insulated arm *n*, all combined and arranged to act automatically, so that as the igniting-points are being brought in contact the arms *n o* will maintain ground-contact until the igniting-points are in contact, but will break such ground-contact before the separation of the igniting-points, all substantially as described and shown.

WILLIAM C. CUTLER.

Witnesses:
DANIEL CURRY,
M. J. FUZZARD.