St. G. L. FOX.

Electric Gas-Lighting Device.

No. 201,175. Patented March 12, 1878.

FIG. 1

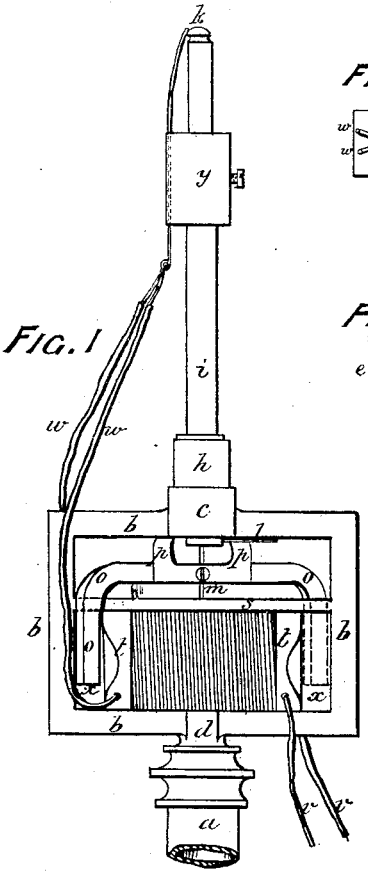


FIG. 8

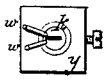


FIG. 7

FIG. 2

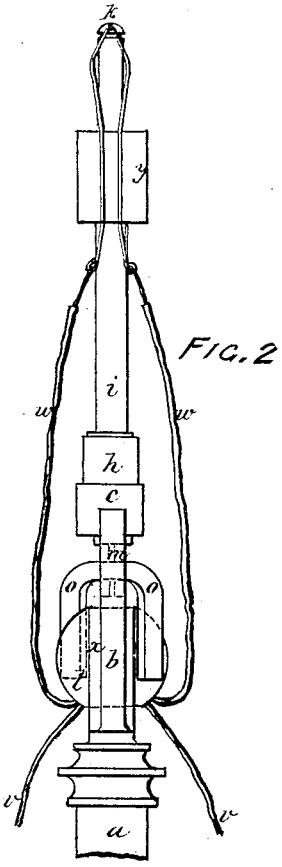


FIG. 3

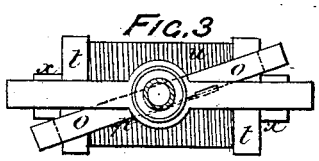


FIG. 5

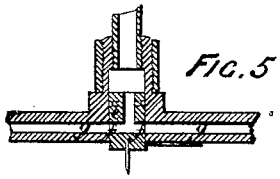
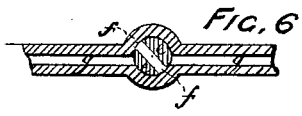


FIG. 4

FIG. 6



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UNITED STATES PATENT OFFICE.

SAINT GEORGE LANE FOX, OF LONDON, ENGLAND.

IMPROVEMENT IN ELECTRIC GAS-LIGHTING DEVICES.

Specification forming part of Letters Patent No. **201,175**, dated March 12, 1878; application filed August 31, 1877.

To all whom it may concern:

Be it known that I, SAINT GEORGE LANE FOX, of London, England, gentleman, have invented or discovered certain new and useful Improvements in the Means or Apparatus for Lighting and Extinguishing Gas-Lamps by Electricity; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters and figures marked thereon—that is to say:

The object of my invention is to enable any desired number of public or other gas-lamps to be lighted or extinguished simultaneously.

For this purpose I connect the lamps together by means of insulated metallic wires, so that an electric current generated at one point or station can operate simultaneously upon every lamp through the instrumentality of an apparatus with which the lamp is provided.

The said apparatus consists, chiefly, of a soft-iron core, and around this core is a coil of insulated wire, thus forming an electro-magnet. The wire of this electro-magnet forms part of the electric circuit by which the lamps are connected. Around the said coil, which constitutes a "primary" coil, is wound a "secondary" coil of fine wire and of much greater length. Above these coils is a permanent magnet, which is free to turn on a vertical axis.

The manner in which I prefer to carry my invention into effect is represented in the accompanying drawings, Figure 1 of which is a front elevation, Fig. 2 a side elevation, and Fig. 3 a plan, of my apparatus. Fig. 4 is a plan of the permanent magnet. Figs. 5 to 8 represent details, and are hereinafter referred to.

a is a socket to screw onto the gas-pipe leading from any ordinary source of supply. *b b* is a rectangular frame, of gun-metal or other suitable material, cast or made with a hollow core, and having two cylindrical portions, *c d*. The part *d* is fixed to the socket *a*, and the part *c* forms the stop-cock, and is shown in sectional elevation in Fig. 5, and in sectional plan in Fig. 6.

e is the plug of the cock. (Shown separately in Fig. 7.) It is made with a very slight downward taper—say of 1 in 130—and has two apertures or ways, *f f*, corresponding with the passages *g g* in the opposite sides of the frame *b*, and it is hollowed out in the middle.

When the gas is turned on, the apertures *f f* come opposite the passages *g g*, the gas having then a free passage from the gas-pipe through the two sides of the frames *b b*, and into and through the plug *e*.

It will be seen, on reference to Fig. 6, that a small turn of the plug is sufficient to open or close the cock.

h is a collar screwed onto the part *c*, and *i* is a pipe screwed into this collar and leading to the burner *k*. *l* is a pin screwed or fixed into the plug near its lower end. The plug is supported on the point of the pivot *m*, on which the magnet (hereinafter described) turns, so that very little power is required to turn the plug. The plug is, in fact, raised very slightly—say one-sixteenth of an inch, in the socket or part *c*, so as not to be in contact therewith; and to prevent any leakage which might otherwise take place, a little oil is supplied to the plug, which has an annular groove, *n*, to retain the same.

o is a permanent magnet, which may be either cast in cast-iron with the two projecting pieces *p p*, or made out of a steel bar bent into the proper shape, and in this case the projections *p p* may be produced by screwing on a piece of metal, as shown, with two projections.

The pivot *m*, on which the magnet turns, is passed through a vertical hole in the magnet, and is fixed to the magnet by a screw, *r*. The lower end of the pivot rests in a step in a bar, *s*, which is cast with the frame *b*.

t is the wooden bobbin, on which is the induction-coil *u*. This coil is composed of a core of soft-iron wires, two layers of primary wires, wound with covered copper wire of about No. 20 B W G, and upon these about ten to fifteen layers of secondary wire of about No. 40 B W G. The primary wires *v v* form part of the circuit by which the lamps to be lighted or extinguished simultaneously are connected.

The ends of the secondary coil are connected to insulated wires *w w*, leading to the burner *k*, where they terminate at opposite sides of the slit of the burner. The burner should be

made of lava or other suitable non-conducting substance. *y* is an insulating-support for the wires *w w*. It is fixed to the pipe *i*, (by means of the screw *z*,) as seen in plan in Fig. 8. The soft-iron core projects about three-eighths of an inch from each end of the wooden bobbin *t*. The bobbin is fastened by the wooden projections *x x* thereon fitting tightly into the frame *b*. In order to protect the apparatus from dust and dirt, I inclose the same in a cylindrical case of zinc or other suitable material.

The action of the apparatus is as follows: Upon an electric current from a magneto-electric machine, or other suitable apparatus, being sent through the circuit which connects the whole series of lamps, the soft-iron core in the apparatus attached to each lamp becomes magnetized, the effect of which is that the permanent magnet *o* is caused to turn on its axis. When it has made about one-third of a revolution the projections *p p* thereon strike against the pin *l*, which passes into the side of the plug of the cock, so that the plug turns with the magnet for the remainder of its movement, and thereby turns on the gas.

The ignition of the gas is effected as follows: One end of the line having been connected to one of the armatures of a condenser of very large surface, the condenser is charged to an electro-motive force of several thousand volts or units. This can be advantageously done by means of a Ruhmkorf coil. The other end of the line is connected with any suitable mechanical arrangement, by which, when it is desired to ignite the gas, contact is made with the other armature, and then instantly broken; or contact can be made by bringing the parts together by hand. A powerful current is thus set up, which ceases abruptly, the result being that a secondary discharge takes place at each burner, the lamp being thereby ignited.

When it is required to extinguish the lamp, a current is again sent through the circuit, but in an opposite direction. The permanent magnet of each lamp is thereby caused to return to its former position, and in doing so it again acts on the pin *l*, and turns off the gas.

What I claim, and desire to secure by Letters Patent, is—

1. In combination with the gas or stop cock of each lamp, a permanent magnet, *o*, made to turn on an axis or pivot by means of an electric current, so as to open or close the cock, substantially as and for the purpose herein described and shown.

2. In combination with the burner *k* and plug *e* of the cock, the pivoted permanent magnet *o* and the induction-coil *t*, with its primary and secondary coils of wires, substantially as and for the purposes herein described and shown.

3. In combination with the pivoted magnet *o*, induction-coil *t*, and plug *e*, the hollow frame *b*, for conducting the gas-pipe to the cock, substantially as herein described and shown.

4. The projections *p p* on the magnet *o*, in combination with the pin *l*, or equivalent, on the plug *e*, substantially as and for the purpose herein described and shown.

5. The tapered plug *e*, supported by the pin or pivot *m*, and with or without the groove *n*, substantially as and for the purpose herein described and shown.

In witness whereof I, the said SAINT GEORGE LANE FOX, have hereunto set my hand this 12th day of July, 1877.

ST. G. LANE FOX.

Witnesses:
I. C. NEWBURN,
GEO. C. BACON.