(No Model.)

G. F. KRIEGER.

ELECTRIC GAS LIGHTING AND EXTINGUISHING APPARATUS.

No. 584,785. Patented June 22, 1897.

Fig. 1.

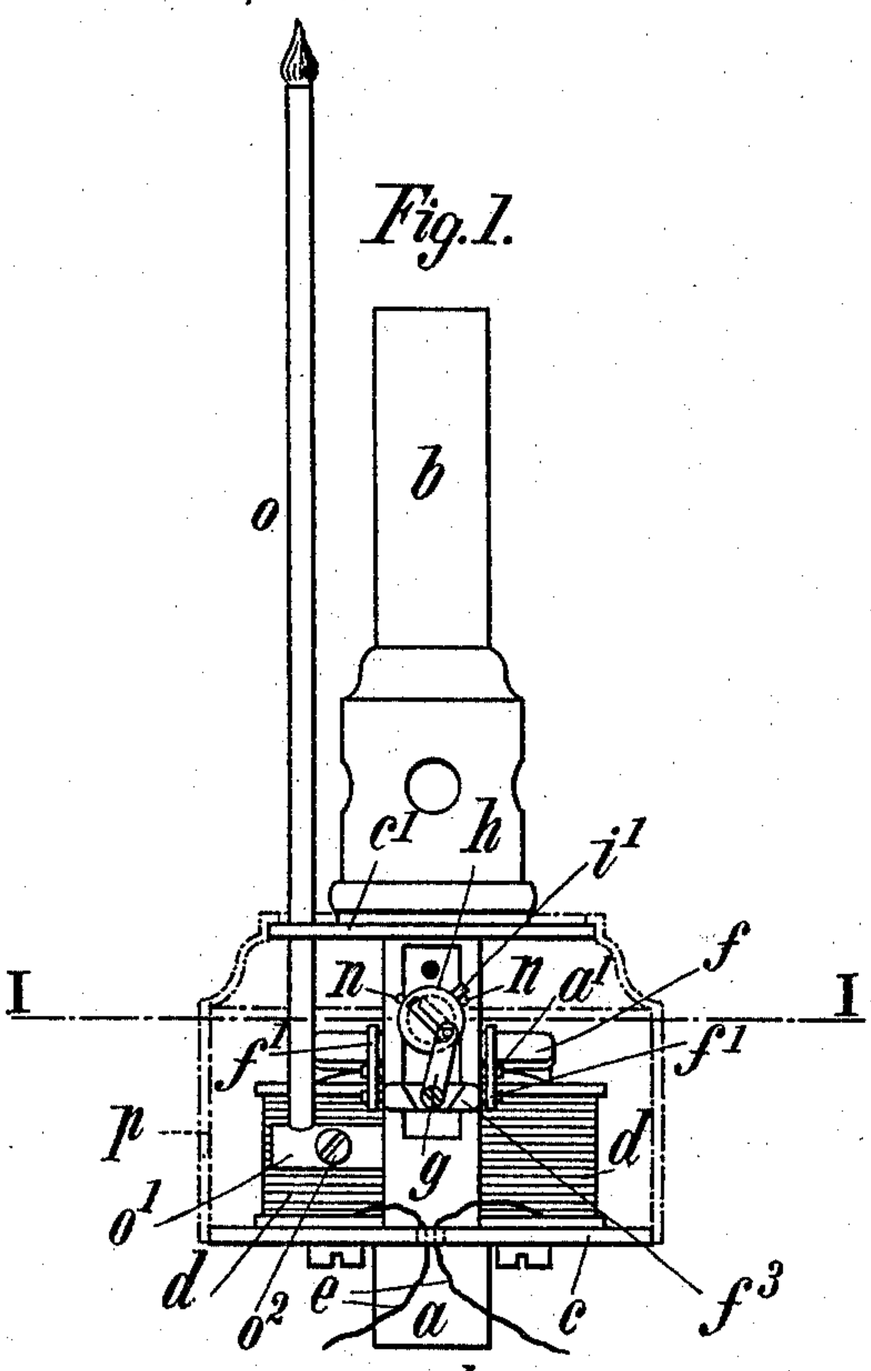


Fig. 2.

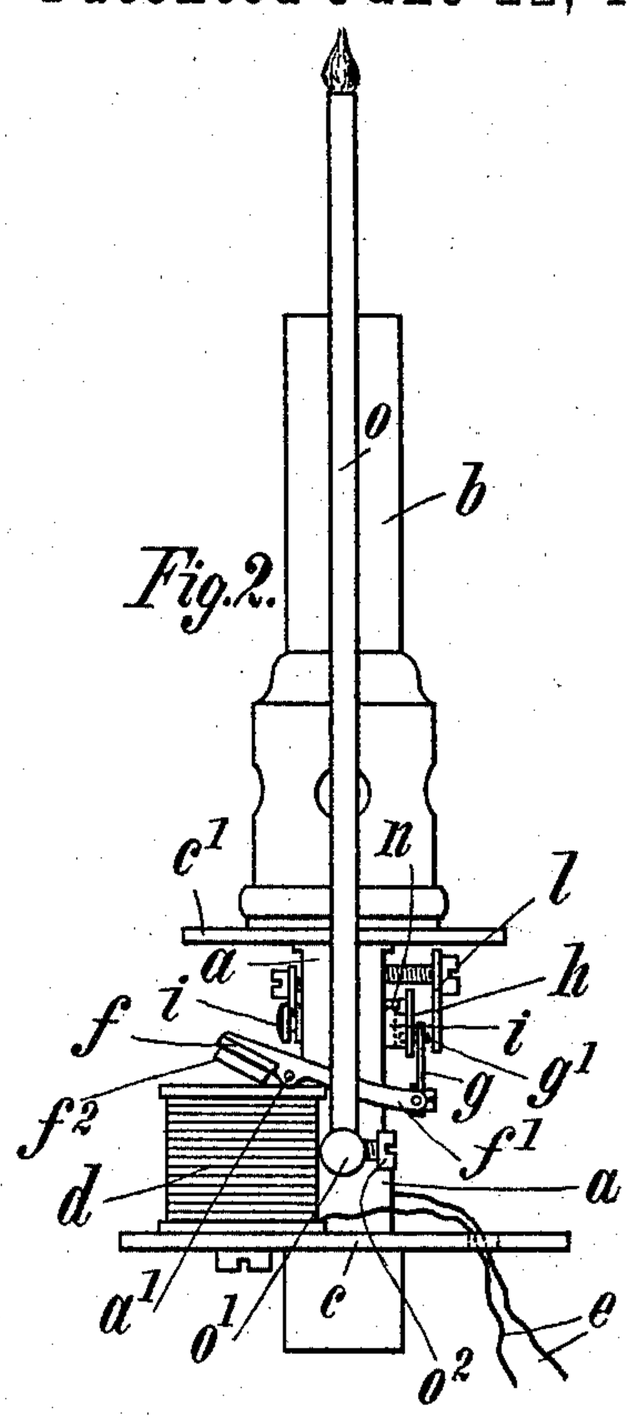


Fig. 3.

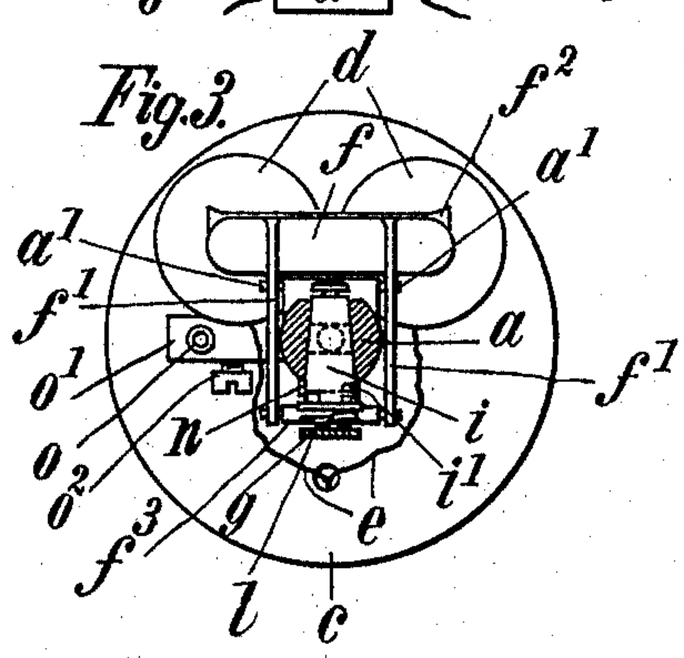


Fig. 7.

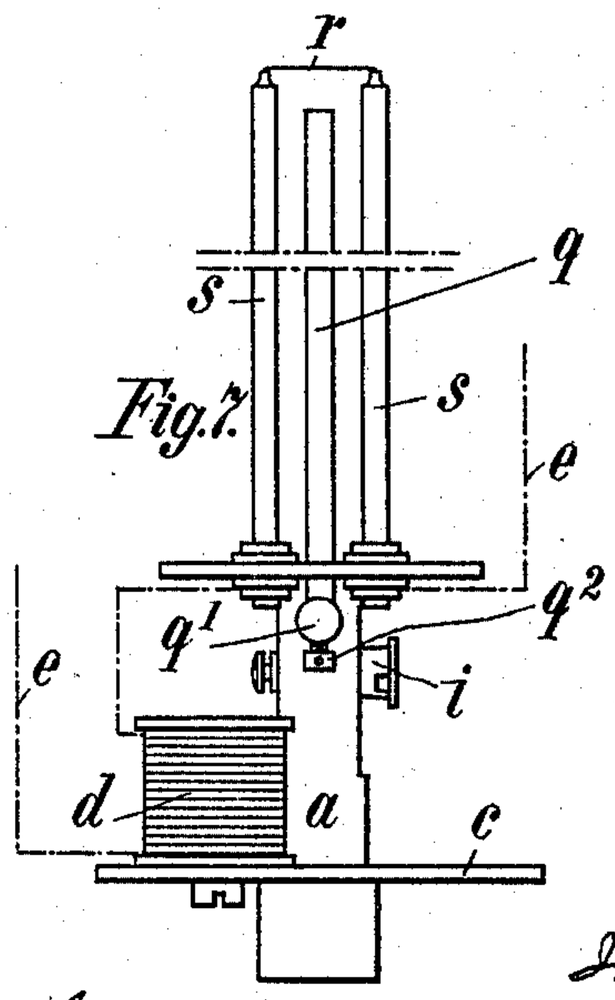
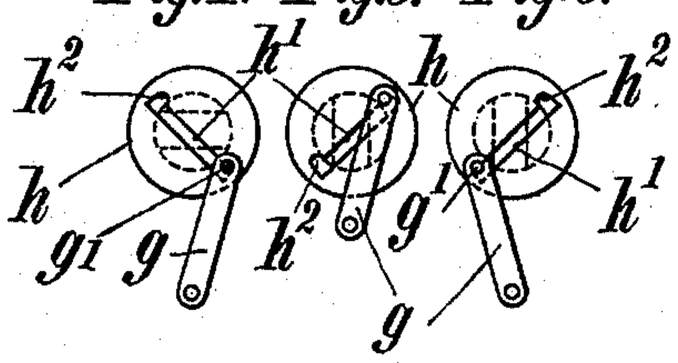


Fig. 4. *Fig. 5.* *Fig. 6.*



Witnesses
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ELECTRIC GAS LIGHTING AND EXTINGUISHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 584,785, dated June 22, 1897.

Application filed March 2, 1897. Serial No. 625,709. (No model.)

To all whom it may concern:

Be it known that I, GOTTFRIED FERDINAND KRIEGER, a subject of the German Emperor, and a resident of Kiel, in the Province of Schleswig-Holstein, German Empire, have invented certain new and useful Improvements in Electric Gas Lighting and Extinguishing Apparatus, of which the following is a specification.

This invention relates to an electric gas lighting and extinguishing apparatus for gas-burners, especially those of the incandescent type, and belongs to that class of electric gas-lighting or gas-igniting devices which enable the igniting and extinguishing of the said gas-burner or gas-burners to be effected from a distant station.

The object of my invention is to procure a simple, cheap, and reliable igniting and extinguishing device; and with this end in view my invention consists in certain novel features of construction and combinations of parts, as will be hereinafter described. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figures 1 and 2 are two side elevations of a Bunsen burner of the incandescent type provided with my improved lighting and extinguishing apparatus arranged in a position at right angles to each other. Fig. 3 is a horizontal section on the line I I, Fig. 1. Figs. 4 to 6 are detailed views, on enlarged scale, showing the connection of the gas-cock with the armature-lever through a link; and Fig. 7 is a modification.

To the gas-supply pipe *a*, carrying in the usual manner the ordinary burner-tube *b* of an incandescent lamp, is attached by any suitable means—*e. g.*, a plate or disk *c*—an electromagnet *d*, having its coils connected through the conducting-wires *e* with a central station, where the electric circuit may be closed or broken. Above the electromagnet *d* is arranged a suitable armature *f*, which is pivotally connected by means of a bifurcated double-armed lever f' to the gas-supply pipe *a*. A spring f^2, attached to the armature, tends to withdraw the latter from the pole of the electromagnet. The free ends of the bifurcated lever f' are connected on the other side of the gas-supply pipe with a traverse f^3, carrying a link *g*, which is adapted to longitudinally slide upon the traverse. This link engages with a stud g' at its upper end a slotted disk *h* on the projecting extremity of the gas-cock *i*. The diametrical slot h' of the disk *h* has on either of its ends a suitable enlargement or recess h^2, the purpose of which will be described hereinafter. A projecting stud i' of the cock *i* and suitable stops *n* of the gas-supply pipe are provided in order to limit the rotary motion of the gas-cock, according to its opened or closed position, respectively.

A small auxiliary burner-tube *o*, which receives gas from a branch o' of the gas-supply pipe at a place below the gas-cock, is kept constantly burning to ignite the main burner as soon as the gas-cock has been opened. The quantity of gas conducted to the auxiliary burner-tube may be controlled by means of a small screw o^2.

The electromagnet, as well as the other appliances for operating the gas-cock, may be inclosed in a suitable casing *p*, which is placed on from above and carried by a plate c', provided for this purpose. A suitable guard *l* may be arranged in front of the disk *h* of the gas-cock *i*.

The operation of the apparatus will then be as follows: When the electric circuit is closed at the distant central station, the armature-lever $f\,f'\,f^2\,f^3$ will be attracted by the energized electromagnet *d*. By this movement of the armature-lever the upper end of the link $g\,g'$, engaging the lowest of the recesses h^2, Fig. 4, of the slotted disk $h\,h'$, is moved upward, and thereby rotates the gas-cock *i* from the closed position, Figs. 1 to 4, into the open position, Fig. 5, limited by the stop device $i'\,n$. The gas thus admitted to pass the gas-cock *i* for supplying the burner *b* will be ignited by the pilot-flame of the auxiliary burner-tube *o*. When the circuit is broken after the ignition of the flame, the armature-lever is moved back into its position of rest by its spring f^2. To prevent back motion of the open gas-cock *i* when its operating arm or link *g* is retracted by the returning armature-lever, the link *g* is adapted to

slide along in the slot h' of the disk h with its studs g' from the upper extreme position, Fig. 5, to the lowest, Fig. 6. In this position the link g is adapted to rotate the gas-cock in the opposite direction and to cut off the gas supply to the burner as soon as by closure of the circuit the armature-lever is again attracted by the electromagnet d. The rotary movement of the gas-cock is limited by a second stop n, as above mentioned. After the circuit has been opened again the operating-link g of the gas-cock slides again with its stud g' in the slot h' of the disk h and moves downward to the recess h^2 at the other end of the slot. The parts are then returned from the open position, Fig. 6, into the closed position, Fig. 4.

From the above it will be clearly understood that the igniting as well as the extinguishing of the burner may be effected from a distant station by simply closing each time a circuit in which the electromagnet d is inclosed.

When it is desired to dispense with the constantly-burning pilot-flame, an arrangement, as illustrated in Fig. 7, may be used to ignite the pilot-flame by means of a small platinum wire r, stretched above an auxiliary gas-jet tube q. The platinum wire is carried by suitable supports s, which are inclosed in the circuit, so that the current having passed the coils of the electromagnet flows through the supports and platinum wire r in order to heat the latter, so that it may ignite the gas escaping from the tube q. In this case the auxiliary gas-tube extends from a branch q' of the main gas-supply pipe a at a point above the gas-cock i. A set-screw q^2 is designed for controlling the quantity of gas required for feeding the pilot-flame.

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

1. The combination with the main burner, the igniter - burner, gas - passages leading thereto respectively, and a normally-closed valve in the main-burner gas-passage, of an electromagnet in a suitable electric circuit, an armature held normally retracted from its magnet, an armature-lever, and a link connected therewith provided with a stud working in a diametral groove in the end of the valve-stem, for the purpose set forth.

2. The combination with the main burner, the igniter - burner, gas - passages leading thereto respectively, and a normally-closed valve in the main-burner gas-passage, of an electromagnet in a suitable electric circuit, an armature held normally retracted from its magnet, an armature-lever and a link connected therewith and provided with a stud working in a diametral groove in the end of the valve-stem, said groove having at each end a lateral recess, for the purpose set forth.

3. The combination with the main burner, the igniter - burner, gas - passages leading thereto respectively, and a normally-closed valve in the main-burner gas-passage, of an electromagnet in a suitable electric circuit, an armature held normally retracted from its magnet, an armature-lever, a link connected therewith and provided with a stud working in a diametral groove in the end of the valve-stem, said groove having at each end a lateral recess, stops on the valve-stem, and fixed stops coöperating therewith to limit the rotation of said stem in one or the other direction, for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 27th day of January, 1897.

GOTTFRIED FERDINAND KRIEGER.

Witnesses:

FRIEDRICH SUHR,

ALEXANDER SPECHT.