(No Model.)

J. L. CREVELING.

ELECTRIC GAS LIGHTER.

No. 541,723. Patented June 25, 1895.

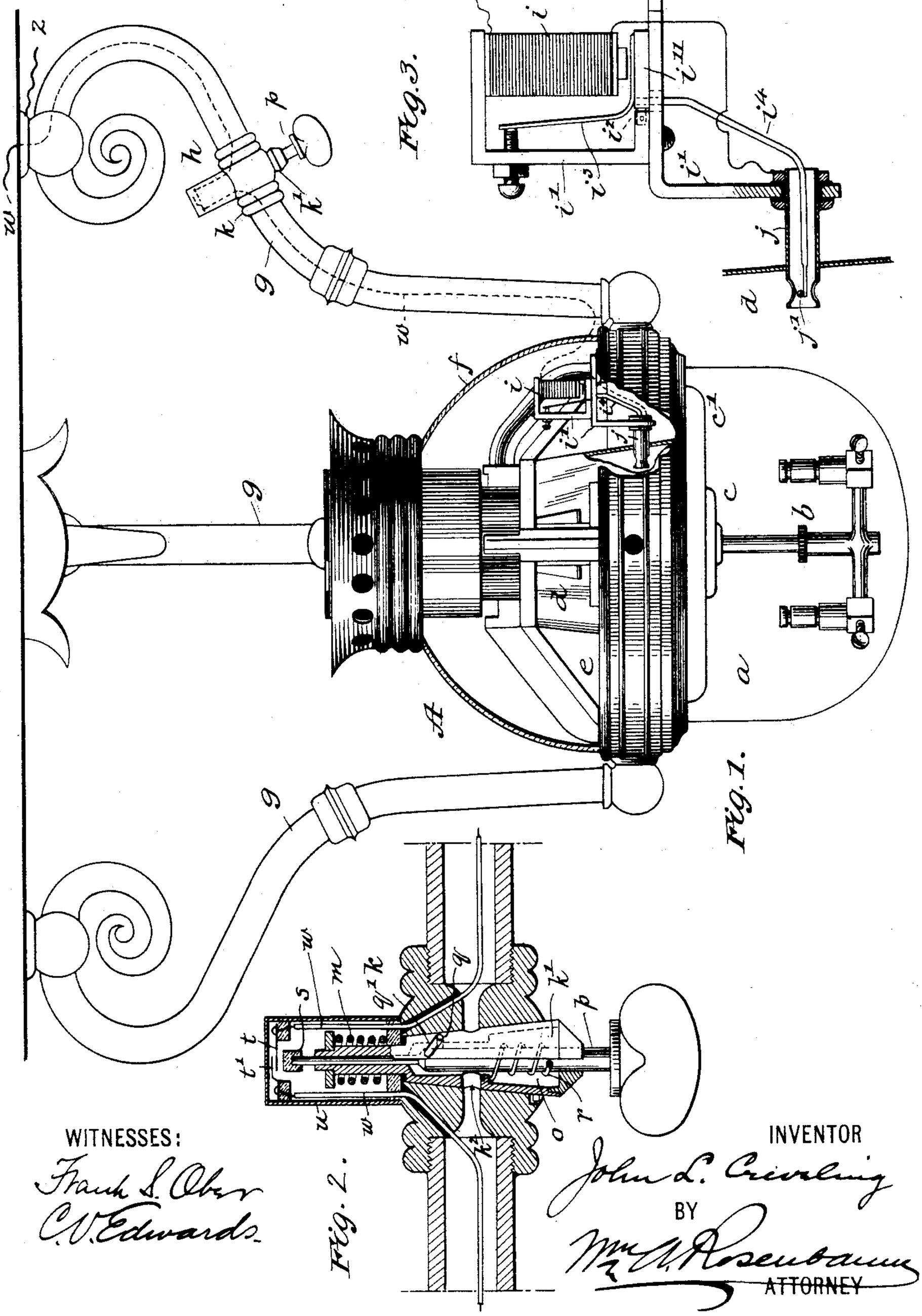

Fig. 1.

Fig. 3.

Fig. 2.

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ELECTRIC GAS-LIGHTER.

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To all whom it may concern:

Be it known that I, JOHN L. CREVELING, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric Gas-Lighters, of which the following is a full, clear, and exact description.

This invention relates to apparatus for igniting gas by electricity and has special reference to means for simultaneously turning on the gas and changing the condition of an electric circuit to produce an ignition of the gas at a point distant from where said two operations take place.

The invention is specially applicable to the "Pintsch" gas system used commonly for lighting railway cars.

In the Pintsch system the burner or cluster of burners is located in a chamber closed below by glass globes and opening above through a draft passage or chamber. The gas cock is located outside of the lamp or fixture, for various reasons, among which may be mentioned the extreme heat inside of the fixture. To ignite the gas by electricity it is necessary to place certain apparatus inside of the fixture and to set such apparatus into operation simultaneously with the turning on of the gas necessitates connection between it and the gas cock.

My invention comprehends the location of an electrical apparatus inside of the lamp capable of creating a spark in the presence of the gas, in combination with a circuit controller attached to and operating in connection with a more or less distant gas cock located inside of the lamp.

The invention also comprehends the arrangement and details of construction to be hereinafter described and fully pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a Pintsch gas-lamp with parts broken away for clearness in illustration. Fig. 2 is a sectional view of the gas-cock and circuit-controller, and Fig. 3 is a detail view of the electrical apparatus located inside of the lamp for creating the igniting-spark.

Referring to the drawings by letter, A represents a Pintsch gas lamp or fixture consisting of the inverted transparent globe *a* inclosing the cluster of burners *b*.

c and *c'* are the usual two reflectors located concentrically above the burners with an open annular space between them directly above the burner tops, forming the beginning or lower end of the draft passage or chamber. Above the reflectors the draft passage is continued through a cylindrical or conical diaphragm *d* of refractory material such as mica or asbestos. This prevents radiation of the heat to the parts of the frame represented by *e* and inclosed by the ornamental globe *f*. The space, therefore, between the mica diaphragm and the globe *f* is operatively cool and inasmuch as there is considerable of this space available I prefer to locate my electric sparking apparatus therein as will be described hereinafter.

The lamp is usually supported by three or four arms *g* from the ceiling of the apartment which the lamp is to light, and the gas passage of the lamp is through one of these arms, such arm containing the gas cock, as at *h*, for controlling the flow of gas and thus located entirely external to the lamp apparatus, easily accessible, and not subject to the heat of the lamp.

The electric sparking apparatus located in the lamp space above referred to consists of an electro-magnet *i* supported on a bracket *i'* secured in any desired manner to a portion of the framework of the lamp. This magnet has an armature *i''* pivoted at i^2 and subjected to the action of a spring i^3 in a direction opposing the pull of the magnet. The bracket supporting the magnet also carries a short tube *j* which is insulated from the bracket, as shown, and projects through the mica diaphragm *d*. The inner end of the tube is provided with lateral openings as well as the end opening to permit gas which may be inside of the draft passage to pass through and across the end of the tube. The inner end of the tube is provided with a cross pin *j'* and to the armature *i''* is attached a bent arm i^4 which leads through the rear end of the tube up to and in contact with the cross pin *j'*. The top of the arm may be platinum if desired. Spring i^3 normally holds the arm in contact with the pin, but when the magnet is energized the force of the spring is broken and the armature

in lifting breaks the contact between the arm and the pin.

Referring now to the gas cock, *k* represents the coupling containing the cock and *k'* the usual conical plug having a transverse passage k^2 which is adapted to be thrown into and out of line with the gas passage by twisting the plug. The plug is held in its conical seat by a spring *m* and thus acts with such force as to necessitate the use of considerable power to rotate the plug. The valve, so far described, is of the usual construction. I propose to bore out the plug longitudinally to form a large interior chamber *o* which narrows down to a small passage extending entirely through the upper end of the plug. Through this chamber and passage I pass a key shaft *p* used to rotate the plug. The upper portion of this shaft makes a close fit with the contracted passage in the upper portion of the plug, but the middle and lower portion of the shaft, although being of greater diameter than it supper end, does not entirely fill the chamber in the plug, so that the gas, when the plug is open, may pass freely around the shaft from one opening to the other. The shaft is connected with the plug by means of a pin *q* passing into an oblique slot *q'* formed in the plug. The pin being fastened into the shaft carries the plug with it whenever it strikes either end of the slot, and on account of the obliquity of the slot the shaft is at the same time caused to move in a longitudinal direction. The shaft is surrounded by a coiled spring *r* which at one end is fastened to the shaft and at the other to the plug. The rotary movement of the shaft while the pin is traversing the length of the slot stores the torsional force in the spring and also a force tending to reverse the longitudinal movement which the shaft makes while the pin is traversing the slot. The extreme upper end of the shaft which projects through the end of the plug carries a head or tip *s* of non-conducting material and when the shaft moves longitudinally upward this tip is adapted to strike two flat contact springs *t* and *t'* and force them together. The springs normally overlap each other and are held apart by their own resiliency. They are mounted upon two insulated blocks mechanically connected with the cup or thimble *u* which is passed over the exposed end of the plug, for the purposes of protection. The circuit wires *w w* lead through the gas passage and terminate respectively at the springs *t* and *t'*. When the key shaft of the valve is turned the first portion of the movement is not communicated to the plug through the spring *r*, as it might be supposed, because the spring *m* creates sufficient friction between the plug and the coupling to prevent the plug from rotating, and during this first movement of the key shaft the only effect produced is the longitudinal upward movement of the shaft which closes the circuit at the points *t t'*. This is accomplished when the pin completes its movement through the slot. Afterward the movement is positively imparted to the plug and the gas passage is opened. At the end of the movement, when the key shaft is released, the torsional and longitudinal forces which have been stored in spring *r* come into action and carry the pin to the opposite end of the slot, at the same time tripping the key shaft and breaking the circuit at *t t'*.

The circuits are as follows: A battery and sparking coil being located at any desired point, an insulated wire leads therefrom through the gas passage to the points *t t'*, thence again through the gas passage to the electro-magnet *i*, thence to the tube *j*, pin *j'*, arm i^4, and thence to the frame of the lamp and the piping system. The other side of the battery is also connected with the piping system, as indicated at 2, thus forming the circuit.

When the circuit is closed at the points *t t'* magnet *i* becomes energized, attracts its armature and separates the end of the arm i^4 from the pin *j'* causing a spark to pass, which will ignite gas if the same is present. The moment the arm and pin separate the circuit of course is broken, the magnet becomes de-energized and spring i^3 brings the arm and pin together again, thus the armature of the magnet continues to vibrate as long as the circuit remains closed at the points *t t'*. In the operation of turning on and lighting the gas the circuit is first closed at the points *t t'* as before described and the sparking in the gas chamber within the mica diaphragm immediately commences. This is closely followed by a flow of gas from the burners, which is caused by the continued movement of the gas cock. The person manipulating the device should hold on to the key shaft at the end of its stroke, and thus hold the circuit closed at *t t'* until the gas is ignited. He then simply lets go of the shaft and the gas remains on while the circuit is broken and the vibration and sparking inside of the lamp ceases.

An improved feature of my invention is the location of the electro-magnet *i* in the space between the protecting globe and the mica diaphragm, because of the comparatively low temperature in this space. It is nevertheless very hot sometimes even in this location and for this reason I insulate the coils of the magnet with fire proof and non-heat-conducting material. Having located the coil in the space referred to, the means for creating a spark in the gas passage becomes important. The extended arm i^4 and the insulated tube passing through the diaphragm are features of this construction. The tube furnishes protection for the points, both from extreme heat and injury when the lamp is being cleaned or repaired. I am aware that it is a common thing to connect a gas cock and an arm directly together for the purpose of causing the arm to vibrate or move past a fixed point adjacent to the burner tip when the gas is turned on and thus create an igniting spark,

but so far as known to me it has never been proposed to close a circuit at or by the gas cock which sets in operation a sparking device at or adjacent to the burner and then automatically open the circuit in the manner described.

Having thus described my invention, I claim—

1. The combination of a gas burner, an electric sparking device located adjacent thereto and operating as long as its circuit is closed, a gas cock controlling the flow of gas to the burner, a circuit controller operated by a handle of the gas cock in its initial movement, to close the circuit and operated again automatically to open the circuit by reason of the release of the handle, substantially as described.

2. The combination of a fluid cock or valve, an independently movable electric circuit controller, a handle for simultaneously operating them and means for returning one of them to its original position when the handle is released.

3. In a plug valve, a key shaft passing through the plug thereof and having a longitudinal motion, in combination with an electric circuit controller operated by the key shaft, and connections between the shaft and plug of the valve, whereby the plug is rotated by the shaft.

4. In a plug valve, a key shaft passing through the plug thereof and having a longitudinal motion, in combination with an electric circuit controller operated by the key shaft, and connections between the shaft and plug of the valve whereby the plug is rotated by the shaft, said connections permitting of some independent movement between the shaft and plug.

5. The combination of a gas lamp provided with a diaphragm or wall forming a gas or draft passage, of a tube passing through said diaphragm or wall, a pair of sparking points located in said tube and electro-magnetic means for making and breaking contact between said points.

6. The combination of a gas lamp provided with a diaphragm or wall forming a gas or draft passage, of a tube passing through said diaphragm or wall, a pair of sparking points located in said tube and electro-magnetic means for making and breaking contact between said points, one of said points being fixed to the tube and the tube forming a part of the circuit.

In testimony whereof I subscribe my signature in presence of two witnesses.

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