

(No Model.)

2 Sheets—Sheet 1.

LE ROY S. WHITE.

ELECTRIC GAS LIGHTING AND EXTINGUISHING DEVICE.

No. 282,816.

Patented Aug. 7, 1883.

Fig. 2.

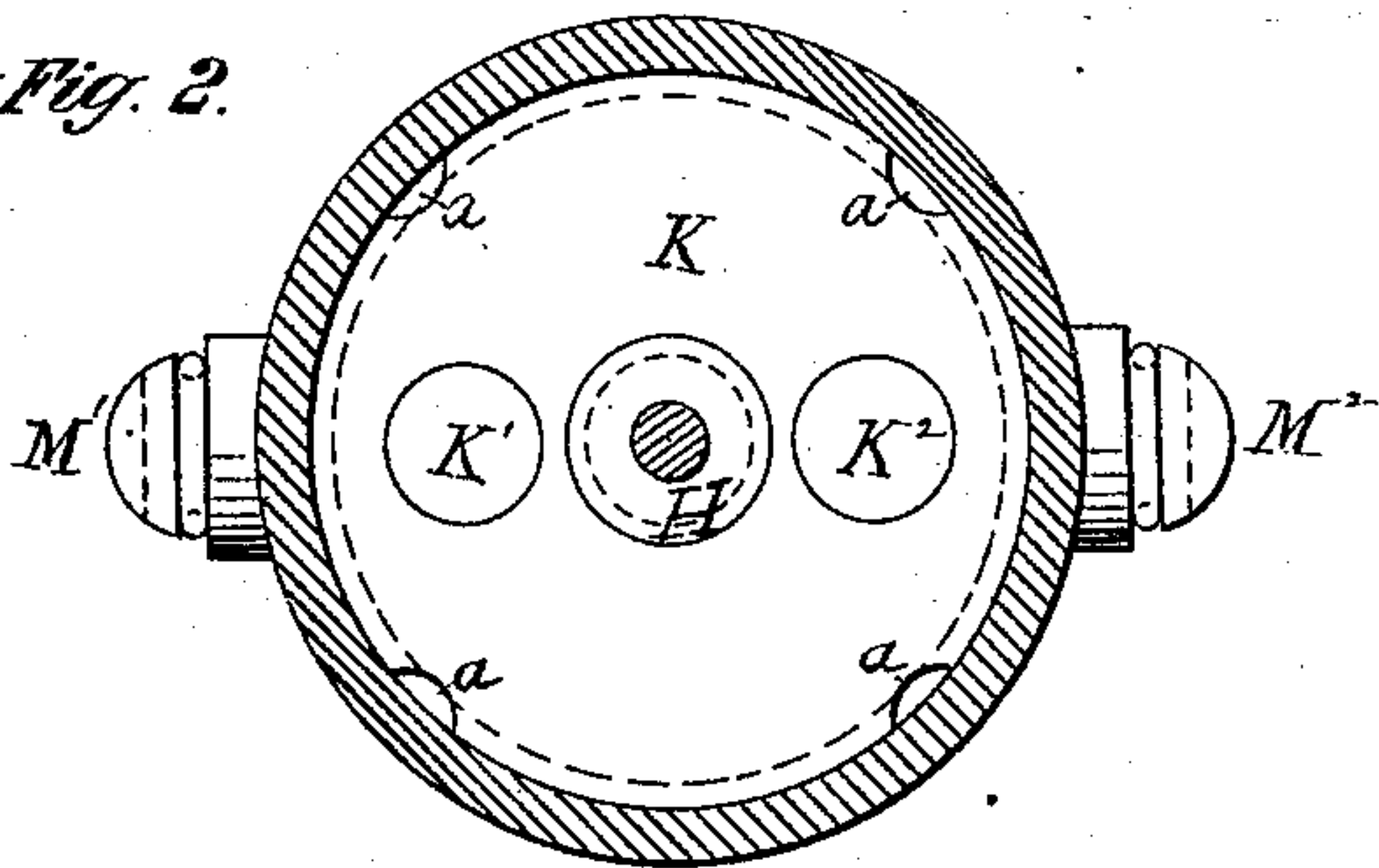


Fig. 1.

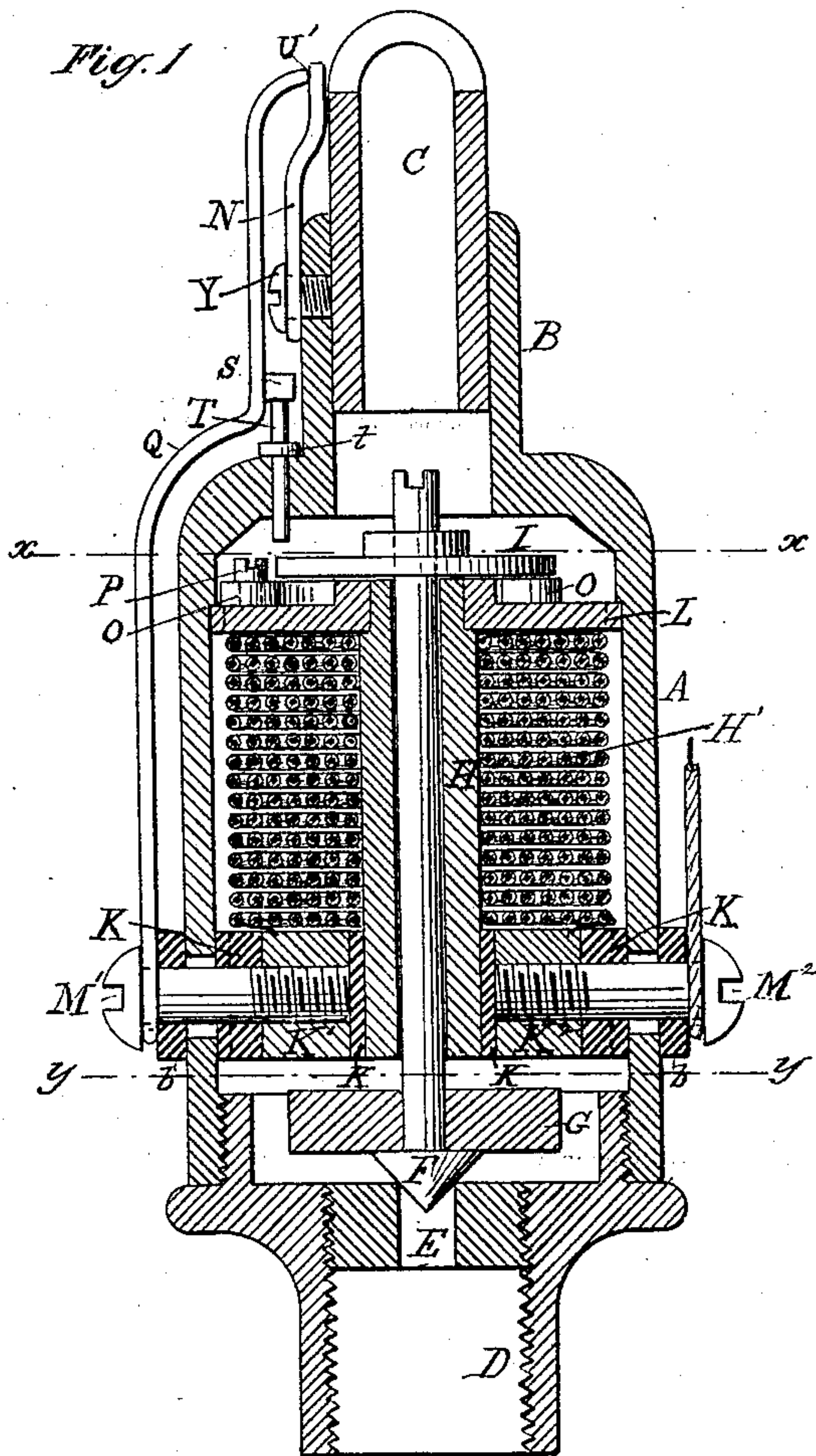
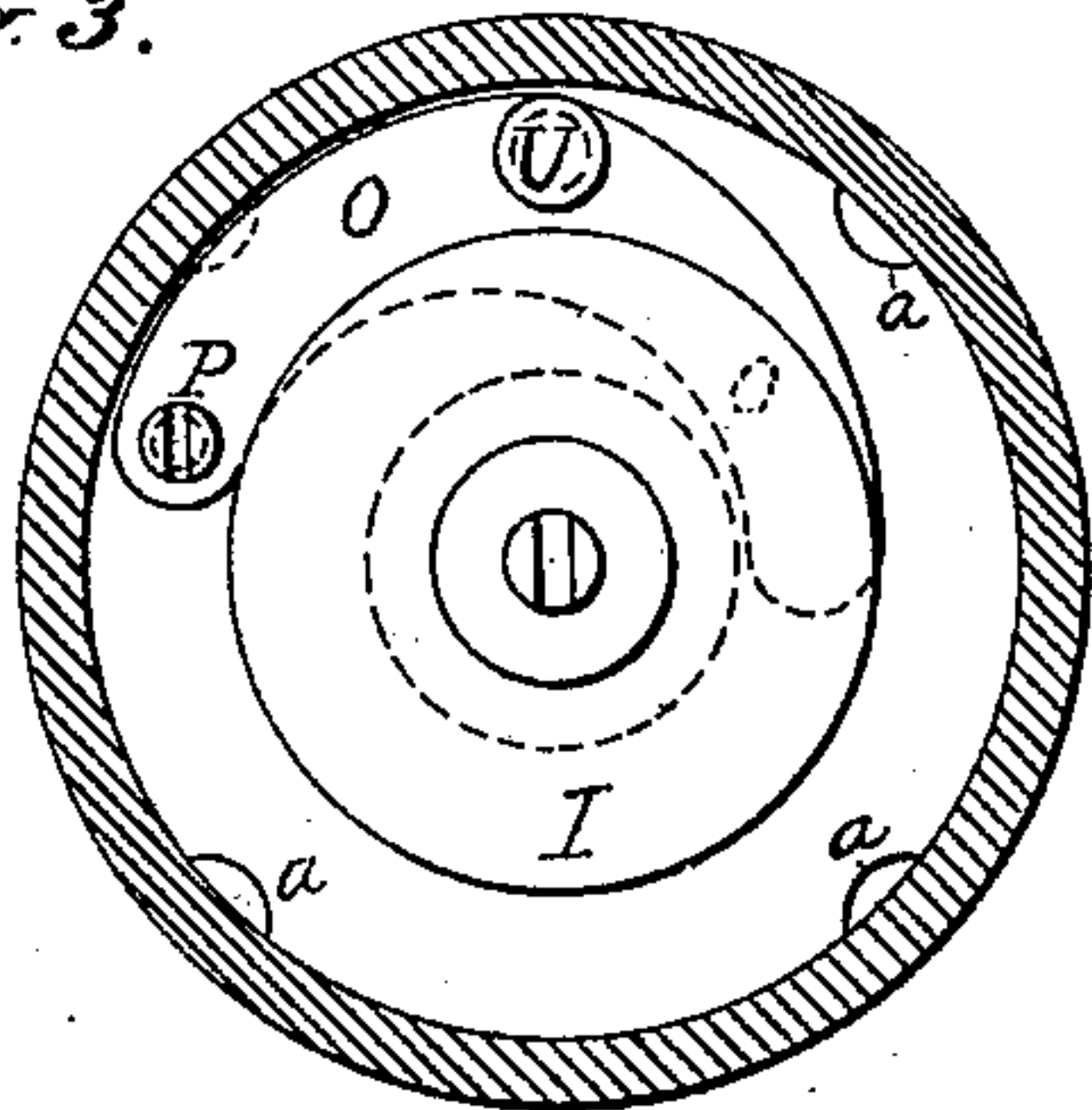


Fig. 3.



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Fred Haymer
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Inventor:
Le Roy S. White
by his Attorneys
Brown & Brown

(No Model.)

2 Sheets—Sheet 2.

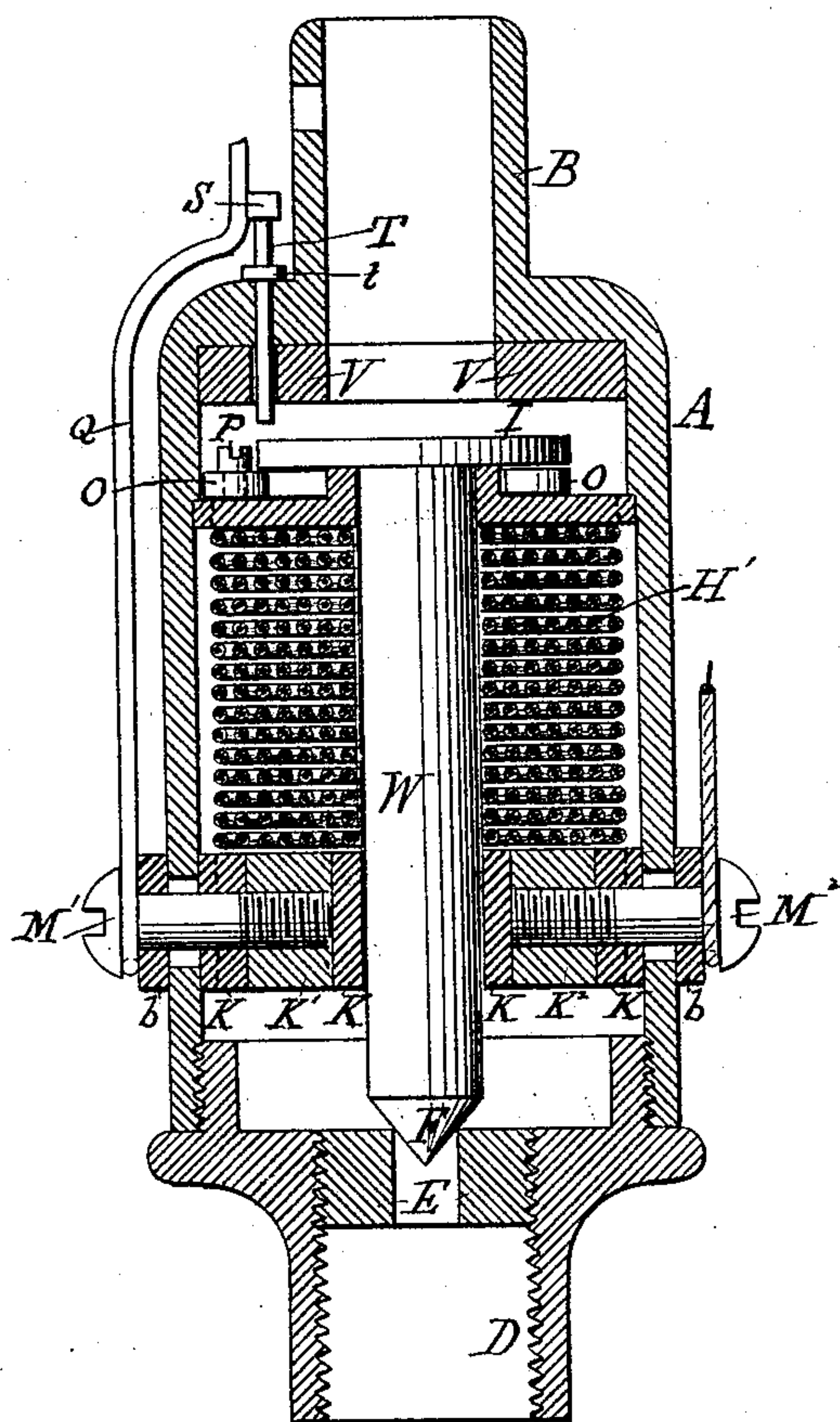
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Fig. 4.



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UNITED STATES PATENT OFFICE.

LE ROY S. WHITE, OF WATERBURY, CONNECTICUT.

ELECTRIC GAS LIGHTING AND EXTINGUISHING DEVICE.

SPECIFICATION forming part of Letters Patent No. 282,816, dated August 7, 1883.

Application filed February 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, LE ROY S. WHITE, of Waterbury, in the county of New Haven and State of Connecticut, have invented certain
5 new and useful Improvements in Apparatus for Turning on, Lighting, and Shutting off Gas by Electricity, of which the following is a specification, reference being had to the accompanying drawings.

10 My invention relates to the class of electric gas-burners in which the valve is opened by the direct action of an electro-magnet, to the armature of which the valve is attached, without intervening mechanism, and which is arranged within the gas-chamber or body of the burner.
15

The invention consists in a novel manner of combining with the valve and the electro-magnet which opens it a permanent magnet, which
20 is moved by the electro-magnet, so as to form of itself a positive stop or lock to hold the valve open, and which, when moved back to its original position, will leave the valve free to close automatically.

25 The invention also consists in other combinations hereinafter described, and referred to in the claims.

Figure 1 represents a vertical section through an apparatus embodying my improvements.
30 Fig. 2 is a transverse section on the plane of the dotted line *y y*, Fig. 1. Fig. 3 is a similar section on the plane of the dotted line *x x*, Fig. 1. Fig. 4 is a vertical sectional view illustrating a modification of my invention.

35 A A is a case of metal to receive the electro-magnet and other parts of the operating mechanism. This case constitutes a portion of the body of the burner, through which the gas passes, and has at its top a projection, B,
40 to receive an ordinary gas-burner tip, C.

D is a socket forming the bottom of the case A, and having an internal thread for attaching it to the gas-bracket and to hold in place the valve-seat E, and also to allow the
45 adjustment of the same.

F is a brass valve, with a stem that passes through and is fastened to the round armature G, and passes through the hollow core H of the electro-magnet, and has secured to its
50 upper part the flange I. The under side of this flange may be considered as forming a

shoulder on the stem of the valve. The upper end of the valve-stem is provided with a nick, to admit the using of a screw-driver for grinding the valve F to its seat E when necessary. 55 The upper head, L, of the bobbin of the electro-magnet is made of brass. The lower head, K, is made of a non-conductor, and in it are two metal nuts, K' K², to receive the screws M' M². The diameters of the heads L and K 60 are equal to the bore of the case; but in order to allow the gas to pass freely to the burner when the valve F is open the edges of the heads are notched (see *a a*, Figs. 2 and 3) in several places, and the bobbin is not wound 65 quite full of wire. Therefore the passage of the gas from the valve to the burner is not obstructed. One end of the wire of the coil H' is connected to one nut, K', and the other end is connected to the other nut, K². 70

O O is a horseshoe permanent magnet, pivoted to the head L, at U, midway from its ends, in such a way as to allow either the north or south pole to approach or recede from the upper end of the core H of the electro-magnet, 75 according to the polarity of the upper end of the core H—that is, if the polarity of the said end of the core H is north it will attract the south pole of the small permanent horseshoe-magnet. The reverse of the above would give 80 the opposite result. On the upper face of one end of the magnet O there is a projection, P, which may be pin-screwed into the said magnet of suitable length to hold the valve up when it is pushed under the flange I, which 85 rises with the valve. In the drawings the valve F is shown closed, resting on its seat E. Holes are drilled transversely through the casing A, the head K, and the nuts K' K². Screws M' M² pass through these holes, and the said 90 nuts are tapped to receive the screw-threads of the screws M' M², for making the connections of the conducting-wire. The holes in the case A are larger than those in the head K and nuts K' K², so that the screws M' M² will not 95 be in metallic contact with the said case when screwed into the said nuts. These nuts are not in metallic contact except with the ends of the conducting-wire and the screws M' M².

Q is an elastic contact-breaker, consisting 100 of a wire or flat metal spring that is fastened to the case A, and connected to the nut K' in

the head K by the screw M', and insulated from the case by some suitable material, *b*. The insulating material *b* packs the enlarged holes in the case A, making them gas-tight.

5 The line-wire is attached to the screw M², which is insulated from the case A by the insulating material *b*, like that around the screw M'. We now have an insulated connection from M² through the nut K², through the coil

10 H', through K', M', and Q, and to the contact-point U' at the gas-jet, which point is at the end of a short wire, N, attached to the case A by the screw Y, returning by the wire N and the case A to the ground connection or wire, as seems

15 desirable.

S is a projection on the contact-breaker Q, made of insulating material, for the pin T to act upon when forced up by the flange I, which is raised every time the valve F is opened by

20 the attraction of the armature G to the electro-magnet.

t is a valve of non-conducting material attached to the pin T, for entirely closing the opening in the case A, through which said pin

25 passes when said pin has reached the end of its downward movement. As the pin T presses against the projection S, it will move Q sufficiently to break the circuit at U', producing a spark at that point. This does not

30 happen, however, until the flange I has nearly completed its upward movement and the valve F is almost fully open.

The direction of the current and its operation are thus described: The current enters at

35 M² through K² to the coil, through K' and the screw M' and the contact-breaker Q, which is in contact with N at U', through N to the case A, back to the key and battery. An ordinary sparking-coil or electro-magnet may be used

40 to increase the spark, and a suitable double key that will send either a positive or negative current, as desired, one button of the said key to be used to open and the other to shut the valve. One wire of the conductor goes direct

45 to the screw M², which connects it with one end of the coil H', and the current passes out from the other end of the coil, through the nut K', the screw M', contact-breaker Q, wire N, and casing A, back to the gas-pipe, and thence

50 to the key. The wires from both poles of the battery pass to the key, and one wire extends from the key to the screw M² and another from the key to the gas-pipe or to the ground, to make a return to complete the circuit. Four

55 wires in all lead from the key—viz., two to the battery, one to the screw M² of the burner, and one to the gas-pipe or ground. The particular button of the key that is pressed determines the direction of the current. A current

60 sent either way raises the valve; but if it is desired to be left open the direction of the current must be such that it will make the upper end of the core H of a different polarity from the end of the magnet O, on which the pin or

65 projection P is attached. The current being sent in the proper direction, the projection P

will be drawn under the washer I and support the valve, and remain so until the current is sent in the opposite direction, when it will reverse the action of the magnet O, and when

70 the key is relieved the valve will drop in place, shutting off the gas. Every time the flange I on the valve-stem strikes the pin T the latter moves Q enough to break the contact at U', thereby making a spark at that point, and if

75 the current sent is the proper one the gas will be lighted and remain so until the current is reversed.

In the modification represented in Fig. 4, V is an armature consisting of a stationary piece

80 of soft iron, which is secured to the top of the casing A on the inside of said casing, and provided with a passage or passages leading to the burner-tip. W is the core of the magnet, having its lower end shaped to form the valve

85 F. The core therefore forms the stem of the valve. This core is adapted to slide up and down within the coil H', as it is attracted or not by the armature V, thus opening and closing the valve F. The flange I in this case is

90 similar to that represented in Fig. 1, but attached directly to the sliding core W, which constitutes a valve-stem. Grooves may be made on the sides of the core W, or notches may be made in the edges of the heads K and

95 L, as in Figs. 2 and 3, and perforations may be made through the flange I, to allow the gas to pass up to the burner-tip C. The apparatus operates in all respects like that previously described, except that the valve, instead of

100 moving with the armature, in this apparatus moves with the core of the magnet.

One merit of this invention is that the valve when left after the operation of the electro-magnet will always be either positively locked

105 open or else is closed, and will never stick half-way, because after the current has been sent one way and is broken there is nothing to hold the valve open, and it drops and closes by gravitation; but after the current has been

110 sent the other way and is broken, the valve must be locked open by the permanent magnet. This is a very special merit, and it is a defect of many other devices for the same purpose that there is not an absolute certainty,

115 when the attendant leaves the key, whether the burner is open or closed.

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

1. The combination, with a gas-burner and

120 a valve adapted to close automatically when released, of an electro-magnet for opening the valve and a permanent magnet, which, by the said electro-magnet, is moved so as to form of itself a positive stop or lock to hold the valve

125 open, substantially as herein described.

2. The combination, with a gas-burner and a valve opening by an upward movement, and adapted to close automatically by gravitation

130 when released, of an electro-magnet for opening the valve, and a permanent magnet which is moved by the electro-magnet, so as to form

of itself a positive stop or lock for holding the valve in an elevated position and open, substantially as herein described.

3. The combination, with a gas-burner, of a 5 puppet-valve opening by an upward movement, and adapted to close automatically by gravitation when released, an electro-magnet for opening the valve, and a permanent magnet which is moved by the electro-magnet, so 10 as to form of itself a positive stop or lock for holding the valve in an elevated position and open, all said parts being arranged within the gas-chamber or body of the burner, substantially as herein described.

15 4. The combination, with a gas-burner, of a valve opening in an upward direction, and adapted to close automatically when released, an electro-magnet for opening the valve, a valve-stem extending from the valve upward 20 through the electro-magnet, and provided above the electro-magnet with a shoulder or flange, and a permanent magnet arranged above the electro-magnet, and adapted to be moved by the electro-magnet into a position below 25 the shoulder on the stem, so as to form of it-

self a positive stop or lock for holding the valve in an elevated position and open, substantially as herein described.

5. The combination, with the burner-body A, of the electro-magnet K L H H', inclosed 30 therein, the armature G, and attached valve F, the flange I on the stem of said valve, and the permanent magnet O, having a stop projection, P, substantially as herein described.

6. The combination, with a gas-burner, of a 35 valve and an electro-magnet for opening the same, both arranged within the body of the burner, a contact-breaker for producing an electric spark arranged entirely outside the burner, and a pin or rod passing from the body 40 of the burner to the outside thereof, and interposed between the said valve and contact-breaker, for producing the action of the contact-breaker by the opening of the valve, substantially as herein described.

LE ROY S. WHITE.

Witnesses:

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