

(No Model.)

LE ROY S. WHITE.

2 Sheets—Sheet 1.

ELECTRIC GAS LIGHTING APPARATUS.

No. 324,058.

Patented Aug. 11, 1885.

Fig. 1.

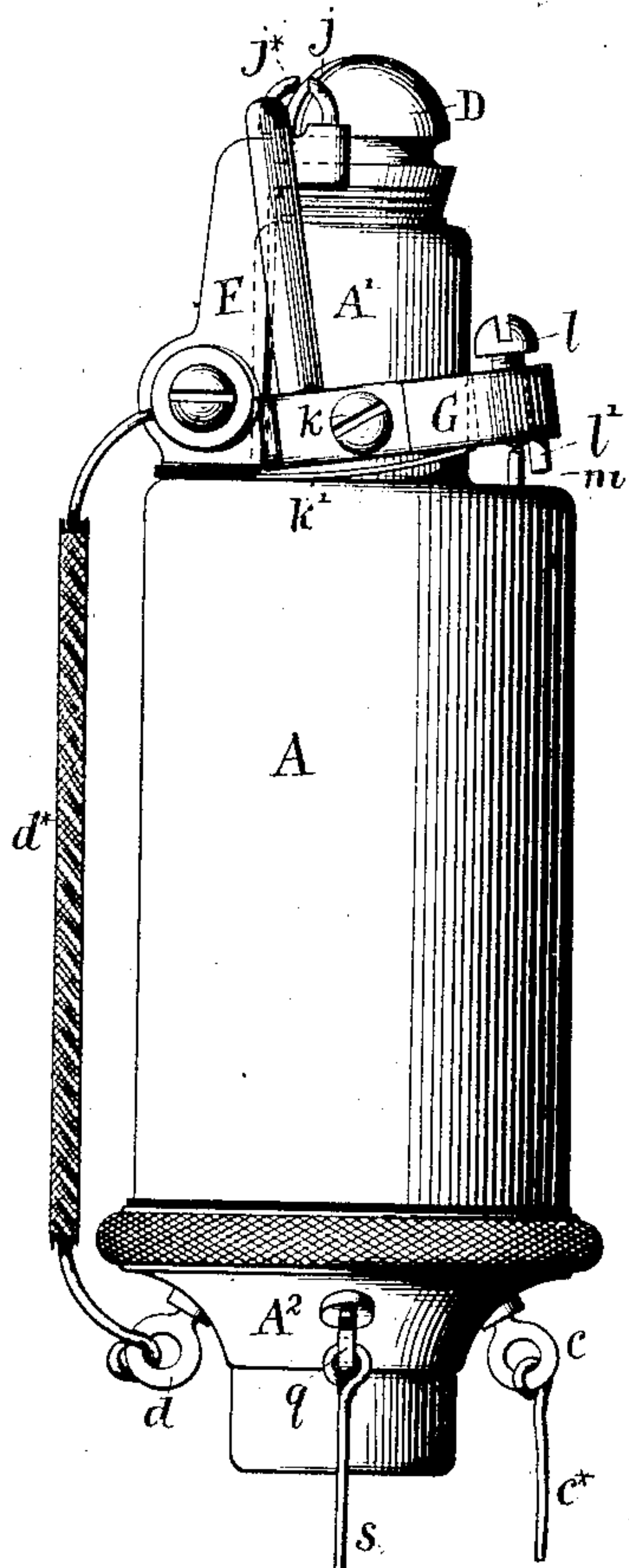


Fig. 2.

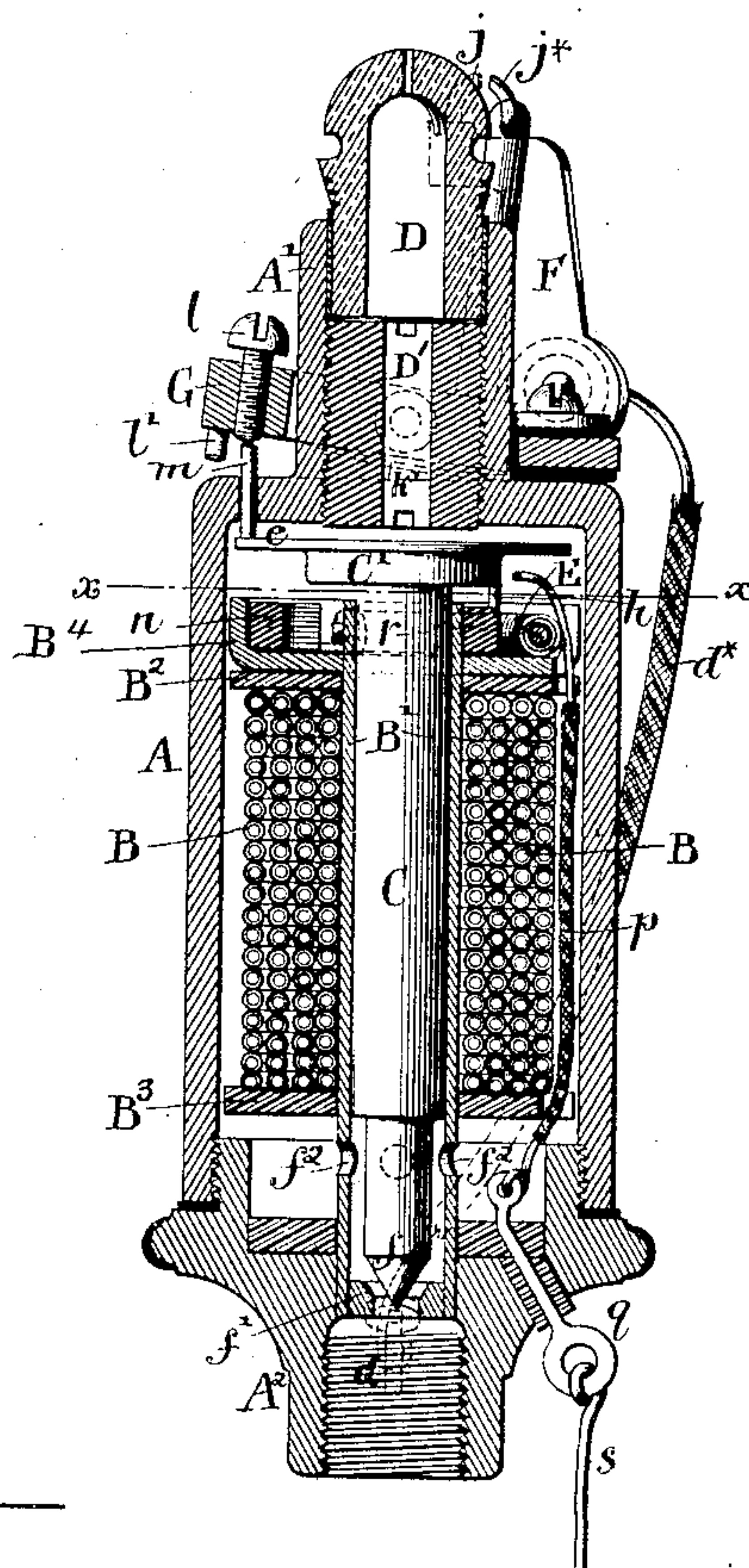
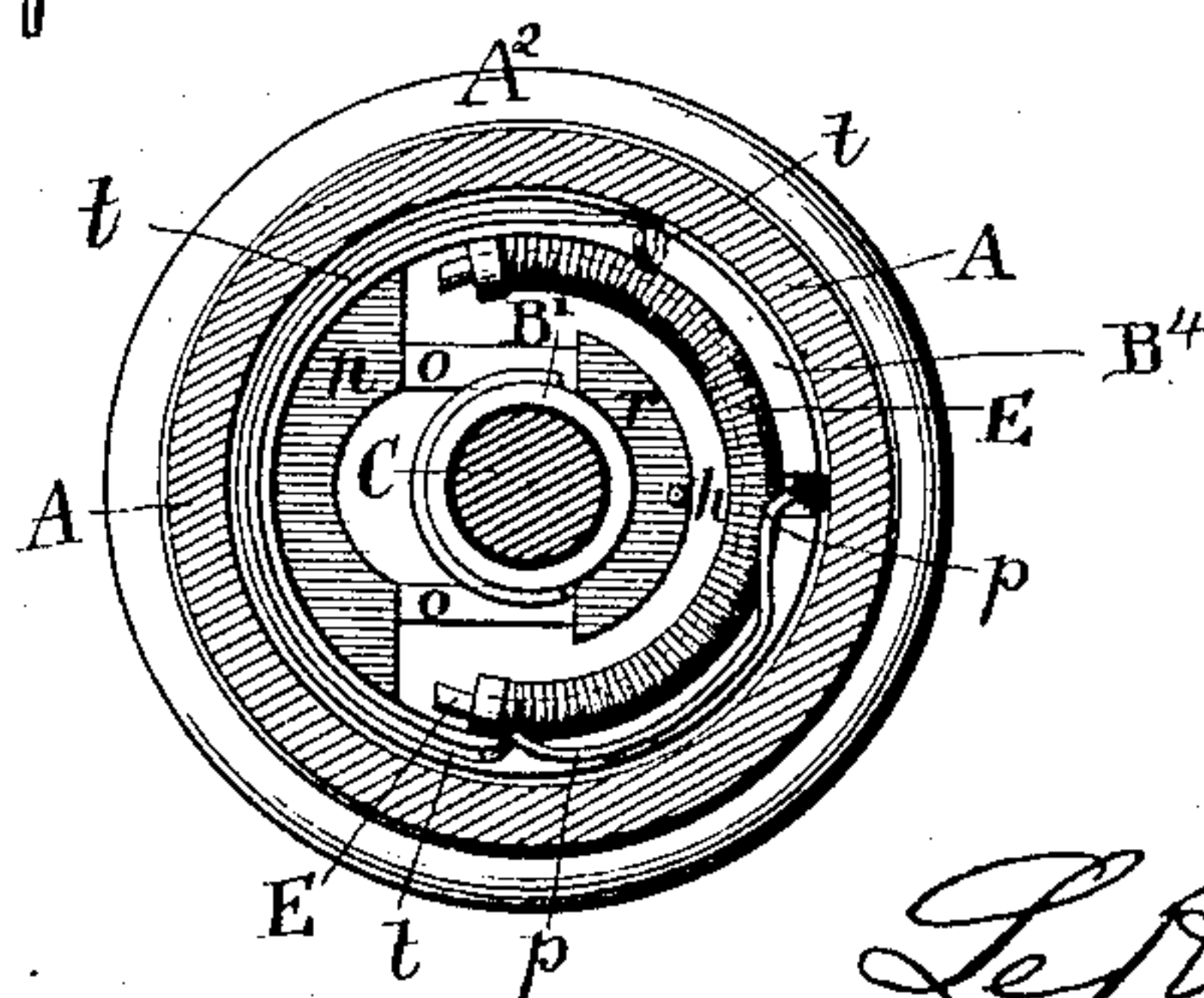


Fig. 3.



Witnesses:

Louis M. F. Whitehead.

C. Sundgren

Inventor:-

Le Roy S. White
by his Attorneys
Brown & Hall

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Fig. 4.

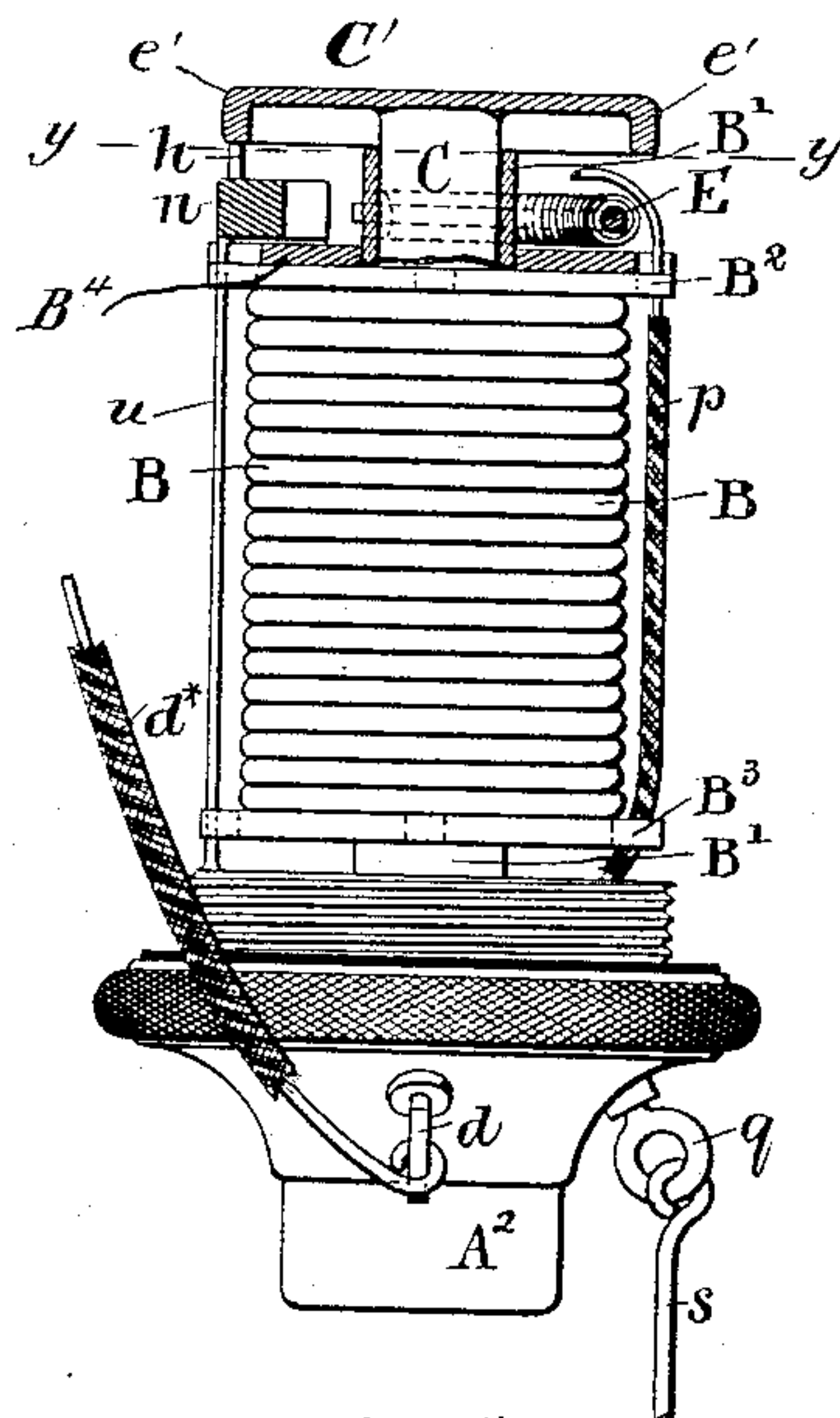
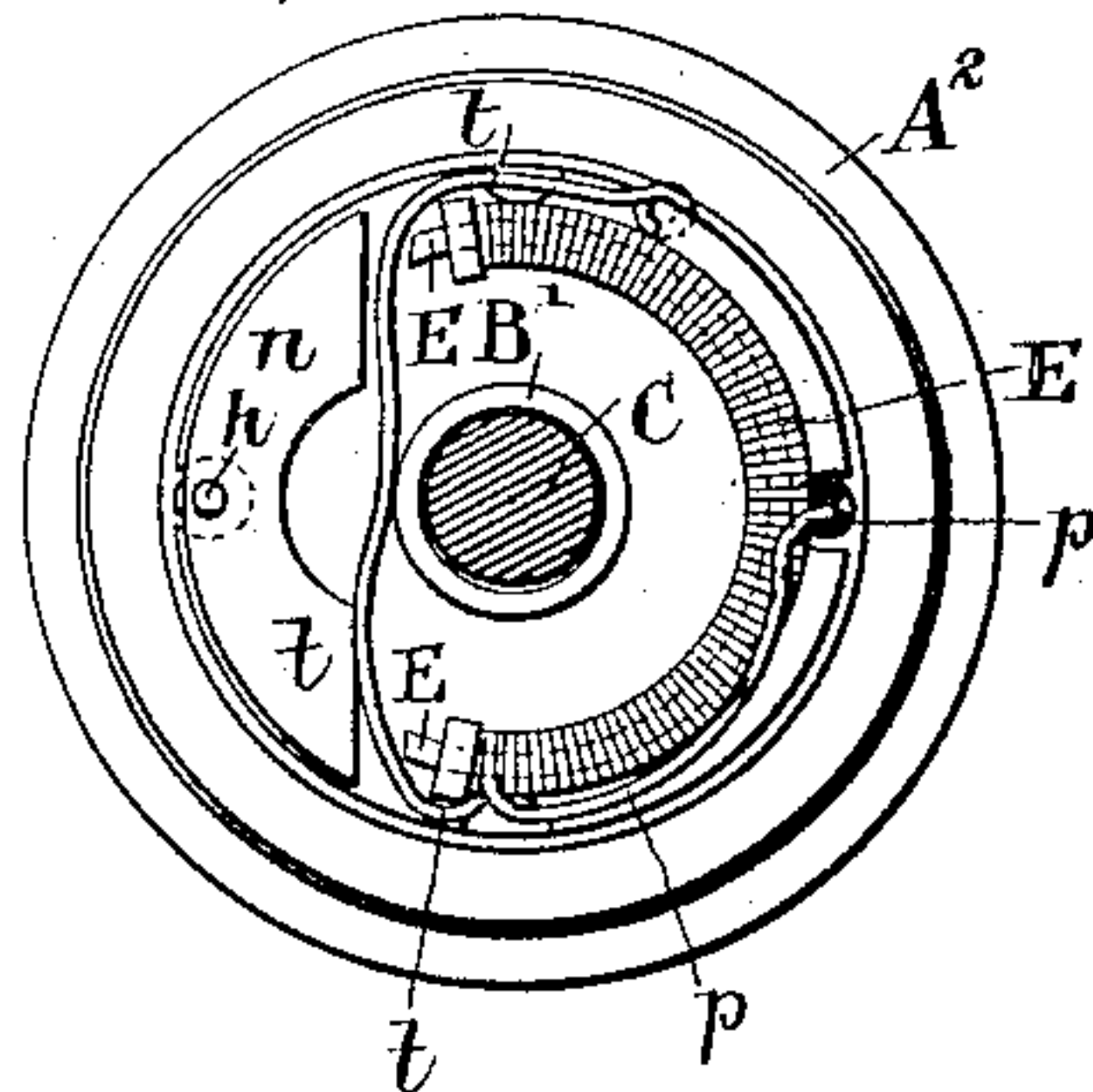


Fig. 5.



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UNITED STATES PATENT OFFICE.

LE ROY S. WHITE, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE
ELECTRIC APPLIANCE COMPANY, OF SAME PLACE.

ELECTRIC GAS-LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 324,058, dated August 11, 1885.

Application filed April 24, 1884. (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 a new and useful Improvement 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 This invention relates, principally, to that class of electric lighting and extinguishing device in which the shutting off of the gas is effected by a valve which closes automatically when free, and the opening of the valve to
15 turn on the gas is effected by an electro-magnet, and in which the sparking device for lighting the gas is operated by the opening of the valve. Examples of such devices may be found in my Patents No. 282,816, dated August 7, 1883, and No. 298,531, dated May 13,
20 1884. In carrying out this invention I use some features which are shown and claimed in those patents; but instead of employing a permanent magnet for locking the valve open and unlocking it to let it close, as described in those
25 patents, I employ according to my present improvement, in combination with the electro-magnet coil and a core carrying a gas-valve and movable vertically in the coil for opening
30 the valve, and serving by its upward movement to also operate the sparking devices, an independent electro-magnet for unlocking the core and valve, and I lock the core in an elevated position, with the valve open, either by
35 an armature actuated by the same magnet which opens the valve or by a spring.

The invention consists in novel combinations of parts, hereinafter particularly described, and pointed out in the claims.

40 Figure 1 in the drawings is an outside view, on a scale larger than the natural size, of an electric gas-burner embodying my invention. Fig. 2 is a central vertical section of the same. Fig. 3 is a horizontal section of the same in the
45 plane indicated by the line *xx* of Fig. 2. Fig. 4 is an elevation, partly in section, of a portion of a burner and its appurtenances, illustrating a modification of my invention. Fig. 5 is a horizontal section on the plane of the dotted
50 lines *yy*, Fig. 4.

Similar letters of reference indicate corresponding parts in the several figures.

A A' A² designate the metal case which forms a gas-chamber, and also constitutes the body of the burner and contains the electro-
55 magnet coil B, the core C of which is loose, and has at its lower end the gas-valve *f*. The upper contracted socket, A', of this case receives the burner-tip D and the principal armature D' of the magnet, and the lower con-
60 tracted socket or base, A², is intended to screw onto the gas-pipe.

The coil B of the electro-magnet is wound upon a tube, B', of brass, which is secured firmly into or integral with the base A², and
65 which has tightly secured on it the heads B² B³, of non-conducting material, between which the coil is contained. In the bottom of this tube B' is the valve-seat *f'*, to which the conical valve *f* on the core C is fitted, and a short
70 distance above the base A² there are lateral openings *f'' f''* in the said tube, through which the gas, when the valve is open, passes freely into the case, wherein it circulates around the
75 coil B, and whence it has free access to the burner-tip. One end of the wire of the coil B is connected with an eye-wire or hook, *e*, and the other end with an eye-wire or hook, *d*, the
80 said eye-wires or hooks being inserted gas-tight into base A² of the burner-case, but insulated therefrom. The eye or hook *e* is to be
85 connected by a wire, *e**, with the battery, (not here shown,) and the eye *d* is connected by a wire, *d**, with the sparking device, as will be presently more fully described.

The core C has a broad head, C', around the upper part of which is a flange, *e*, above which a small pin, *m*, works easily, but not loosely enough for the escape of gas through a hole in the top of the case. When the core C is
90 raised, by sending a current through the coil B, and the valve thereby opened, the flange *e* pushes up the pin *m* against the metal lever G, which carries the movable contact-point *j** of the circuit-breaker, and so separates the
95 said point, as shown in Figs. 1 and 2, from the fixed contact-point *j*, which is attached to a post, F, which is firmly secured on the top of the case, such separation producing the gas-
100 igniting spark. This post F is insulated from

the case, and is connected by the wire d^* and the hook or eye d with one end of the wire of the coil B.

The lever G works on screws k k , secured in the upper part of the case, but is not insulated from the case. The said lever is provided with a screw, l , to adjust it for the proper action of the pin m , and has a small projection, l' , on the under side, to give it a good support on the case while the screw l is being adjusted. A spring, k' , is applied under the lever G, to maintain sure contact of the contact-points j j^* at all times except at the instant of sparking.

Under the head C' of the core, in the example shown in Figs. 2 and 3, there is fast on a portion of the tube B' which projects above the coil a broad metal flange, B^4 , (represented as of cup shape,) which serves to support the small independent electro-magnet E and its armature n . This magnet is represented of horseshoe form. (See Fig. 3.) This armature has connected with it by small yoke-pieces o o , of brass, a second armature, r , from the top of which projects a pin, h . This pin may be brought by the movements of the armatures either to the position under the thick part of the head C' of the core, as shown in Fig. 2, where it will hold up the core and lock the valve f open, or to a position outside of the thick part of the head and under the flange e , where it will fail to support the said core and will unlock the valve, so that the valve is left free to close by gravitation. The movements of these armatures n r are so restricted by the room left for n between the cupped margin of the flange B^4 and the poles of the magnet E that the armature n can move to the poles of E, and the armature r can approach the core C very much nearer than it is possible for n , and hence when there is a current through the coil B the armature r is drawn toward C enough for the pin h to lock the valve open, and when there is a current through E the armature n is drawn toward the poles of the latter and made to move the pin h outward to a position to unlock the valve. It will be observed that the two armatures always move in unison, both being moved when the current is sent through either coil B or E, and that either coil puts them in a position to be acted upon by the other coil.

The wire p from one end of the coil of the electro-magnet E passes down inside of the case and outside of the coil B to an insulated eye-piece or hook, q , inserted tightly through the base of the case, and this eye-piece or hook is to be connected by a wire, s , with one pole of the battery. (Not here shown.) The wire t from the other end of the said coil is connected with the metal flange B^4 .

The apparatus thus constructed is operated by a single battery, one pole of which is connected with s and the other with c^* , and the closing of the circuit through one electro-magnet on the other is effected by means of one or other of two separate keys, or by press-

ing one or other button of a double key, from which two wires lead to the burner—one for the main coil B and the other for the small electro-magnet E—the normal condition of the key being that which leaves both magnets in open circuit.

When the circuit is closed through the coil B, by pressing on the proper button of the key, the current is from the battery through c^* and c to coil, out at d^* to F, through j^* , j , and G to casing, and thence by the gas-pipe to the ground. The core C is then lifted, and the valve f thereby opened. The armature r is attracted toward the core C, and the pin h thereby brought under the thick part of the core-head C' , and caused to lock the valve open. The lifting of the valve causes the flange e of the core-head to raise the pin m against the lever G, and cause the latter to break the contact at j j^* , and so produce the lighting-spark. The button of the key having been depressed only long enough or often enough to produce the turning on and lighting, the key is left free and the circuit open until it is desired to turn off gas, when the other button of the key is depressed. The current now comes from the battery to s , thence through q and p to the magnet E, thence through wire t to flange B^4 , and through tube B' to case, and thence by gas-pipe to ground. The armature n is then attracted toward the magnet E, and the armature r , moving with it, carries the pin h out from under the thick part of the core-head C' , and allows the core to drop by its own weight, and the valve to close.

In the modification illustrated by Figs. 4 and 5 the armature r is dispensed with, and the locking of the lifted core C with the valve open is effected by a spring, u , the lower part of which is secured to the base A^2 of the case, and the upper end of which is connected with the armature n . The only other feature in which this modification differs from what is shown in Figs. 1, 2, 3 is in the form of the core-head C' , which here has a downwardly-turned flange, e' . In this case all that the small independent electro-magnet does is to unlock the core, the locking being effected by the pin h on the armature n coming under the edge of the flange e' , and the unlocking by the armature n withdrawing the pin h from under the flange e' . When the circuit is closed through the coil B, and the core is lifted to bring the lower edge of the flange e' above the pin h , the armature n , being free, is moved by the spring u to bring the pin h under the said flange, and locks the core up and the valve open; but when the circuit is open on B and closed on E the attraction of the armature n moves it to carry the pin h from under e' , and unlocks the core and valve.

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

1. The combination, with a gas-burner having a case wherein is arranged an electro-magnet coil, of a core movable vertically within the coil of the electro-magnet, and carrying

a valve for controlling the flow of gas to the burner-tip, sparking devices, and a connection through which the core operates upon them as it rises, to produce sparking, a locking device for holding the core elevated and the valve open, and a second electro-magnet for unlocking the locking device and allowing the core to fall to close the valve, substantially as herein described.

10 2. The combination, with a gas-burner having a case wherein is arranged an electro-magnet coil, of a core movable vertically within the said coil, and carrying a gas-valve, and provided above the said coil with a head or
15 laterally-extending flange, sparking devices, and a connection through which the core operates upon them as it rises to produce sparking, an independent electro-magnet arranged above the main electro-magnet, and a lateral-
20 ly-movable armature and a stop which serves to hold the core elevated and the valve open, and which, when attracted by the independent electro-magnet, will withdraw the stop from below the head of the core and allow the core
25 to fall and close the valve, substantially as herein described.

3. The combination, with a gas-burner and a case wherein is arranged a main electro-magnet coil, of a core movable vertically in

the coil, and carrying a gas-valve, sparking devices, and a connection through which the core operates upon them in rising to produce sparking, an independent electro-magnet, and two armatures connected together, so as to move simultaneously, and carrying a stop for
35 locking the core in its elevated position, one of said armatures being arranged to be attracted by a current through the main electro-magnet coil, and the other by a current through the independent electro-magnet, substantially
40 as herein described.

4. The combination, with the burner-casing having a valve-seat at the bottom, the electro-magnet composed of a tube, B', coil B, central
movable core, C, and armature D, all within the
45 said case, the valve *f* at the lower end of the said core, and the broad core-head C' on the other end of said core, of the electro-magnet E, arranged within the said casing above the
50 first-named electro-magnet, the two connected armatures *n* and *r*, placed on opposite sides of the said core C, and the locking-pin *h*, attached to one of said armatures, all substantially as herein described.

LE ROY S. WHITE.

Witnesses:

CHAS. W. GILLETTE,
MARY A. SOLOMON.