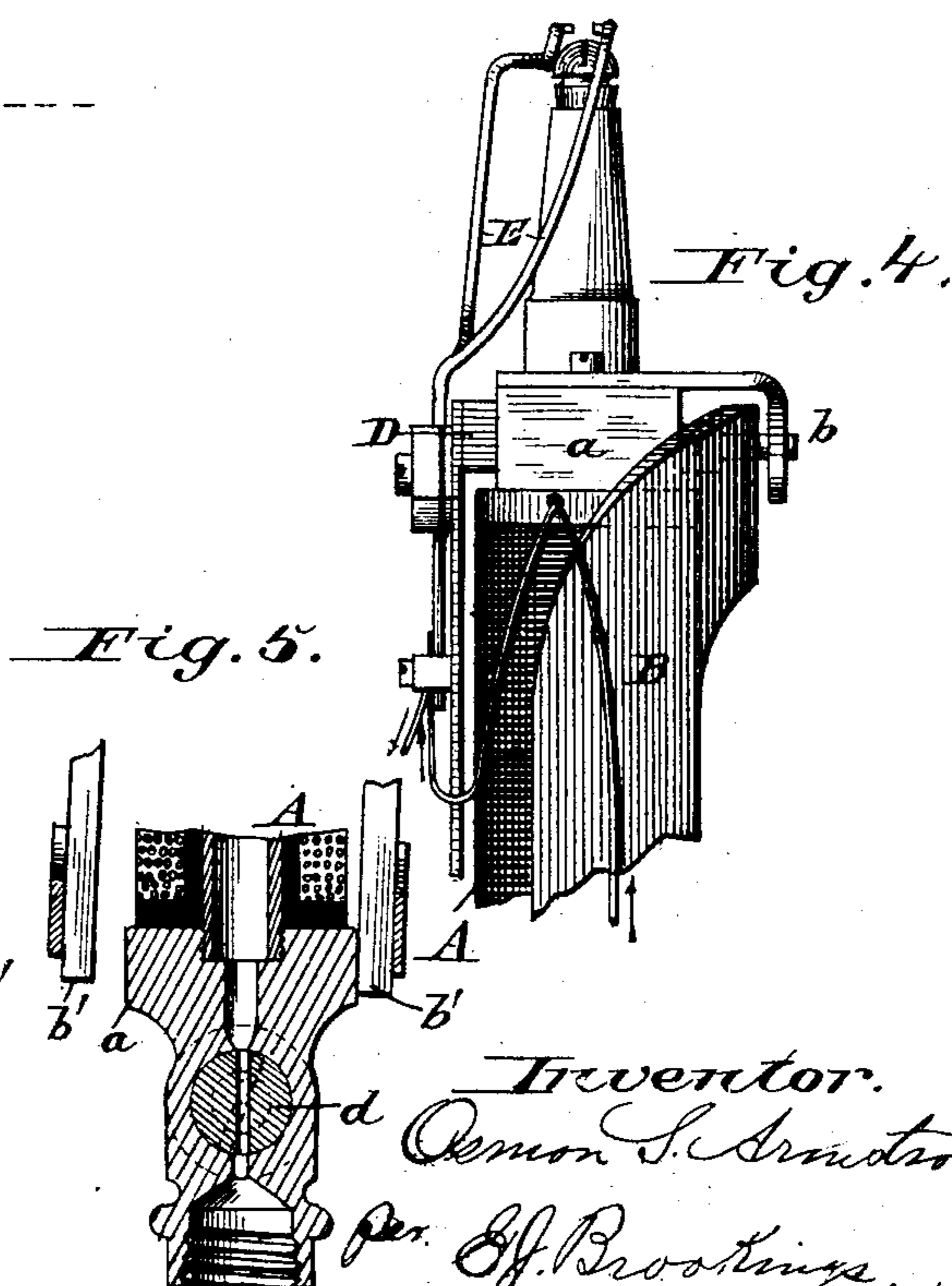
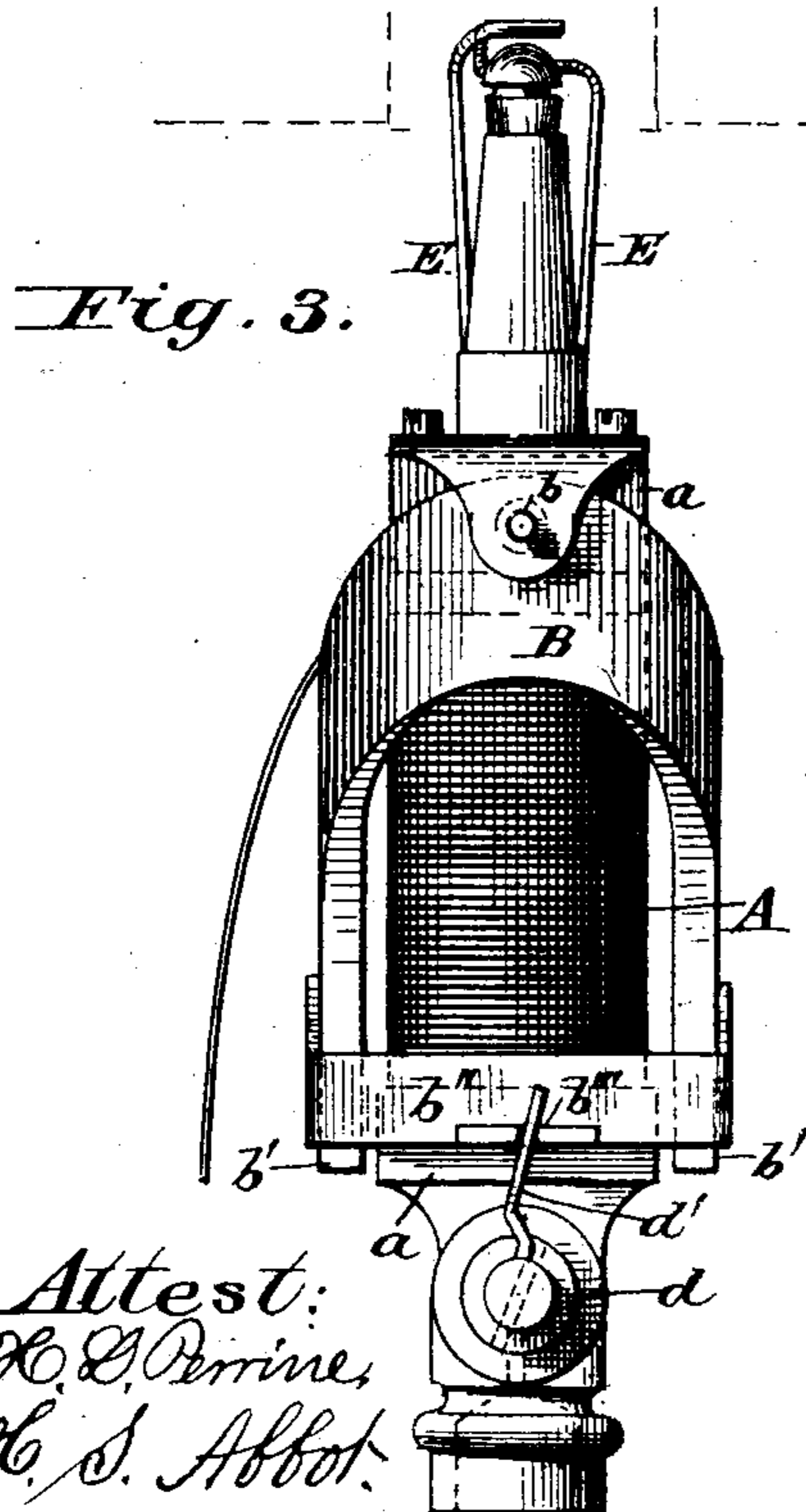
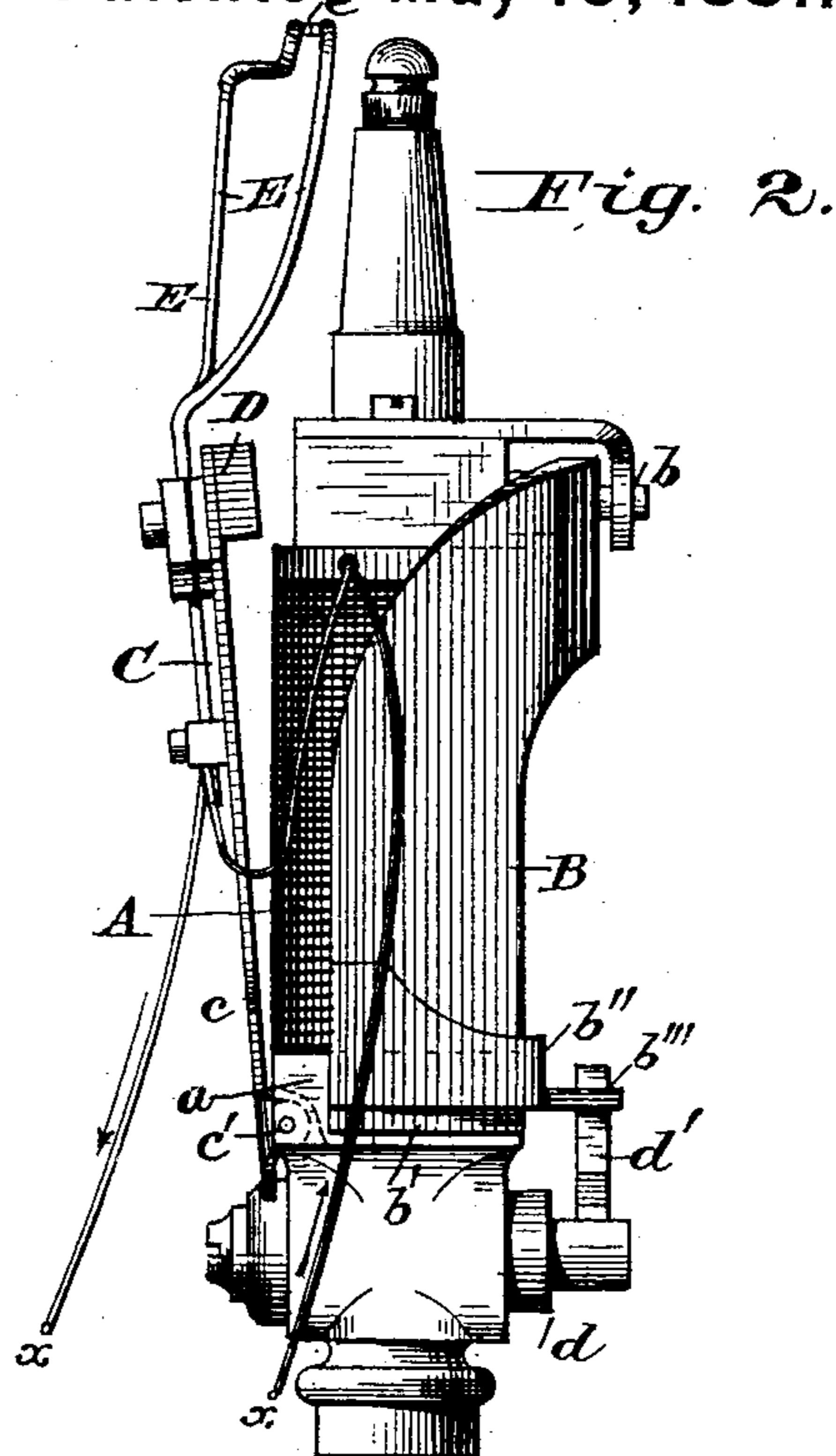
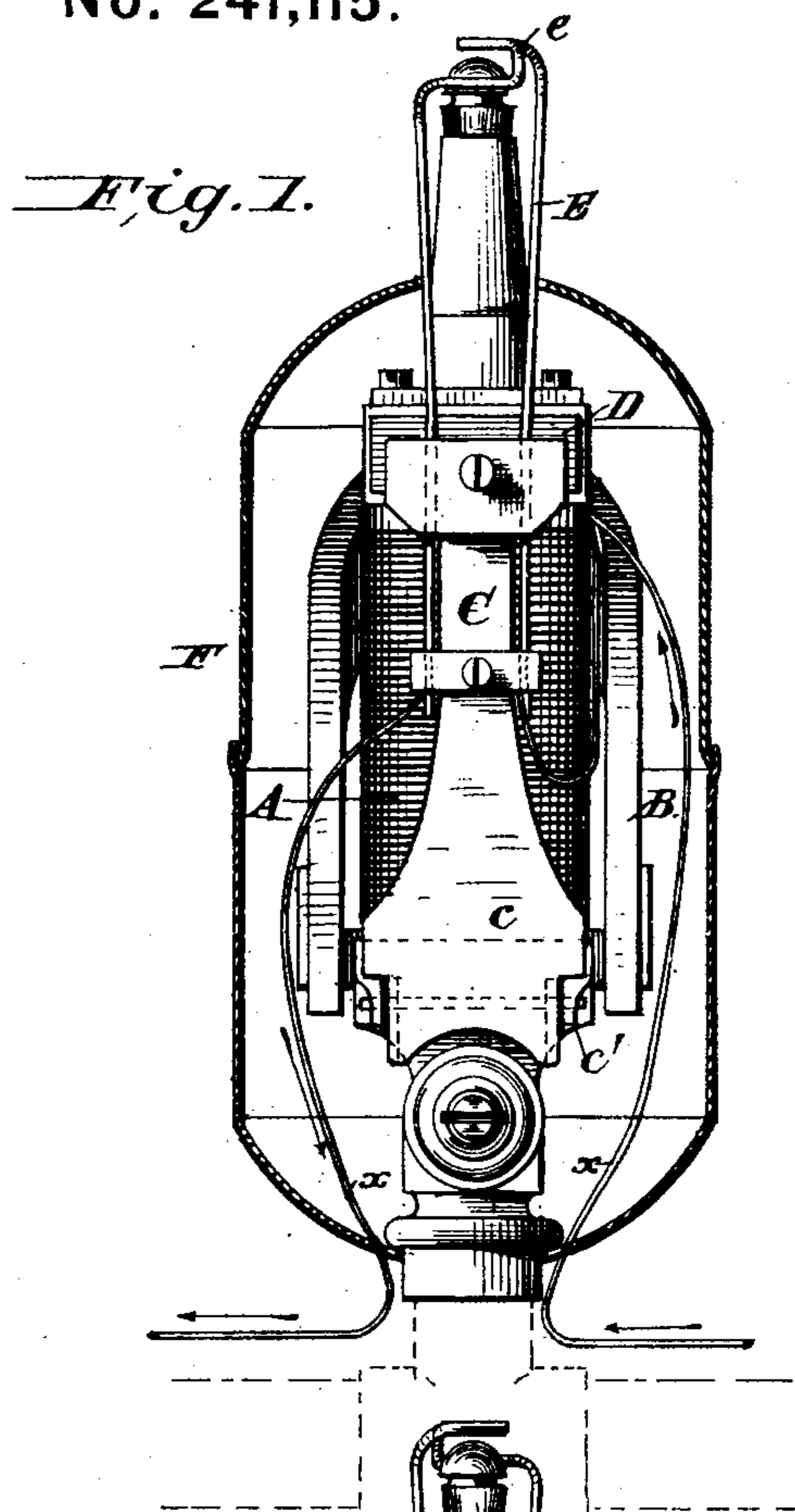


(Model.)

O. S. ARMSTRONG.
Electric Gas Lighting Apparatus.

No. 241,115.

Patented May 10, 1881.



Attest:
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UNITED STATES PATENT OFFICE.

OSMON S. ARMSTRONG, OF CAMBRIDGE, MASSACHUSETTS.

ELECTRIC GAS-LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 241,115, dated May 10, 1881.

Application filed August 17, 1880. (Model.)

To all whom it may concern:

Be it known that I, OSMON S. ARMSTRONG, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Electric Gas-Lighting Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of the specification.

My invention relates to that class of electric gas-lighting apparatus in which an electro-magnet is located in proximity to the burner, and wherein the same current opens and closes the gas-cock to control the flow, and also causes the ignition of the gas by the passage of the electric spark when the current is broken.

My invention consists, mainly, of a circuit-breaker composed of a spring or plate pivoted upon some convenient part, and carrying two flexible arms having platinum tips or electrodes, said arms being curved in such a manner that one of them passes over the gas-burner tip, while the other is so curved that it strikes against and rests upon the gas-tip, the force being sufficient when the armature, which is also affixed to the plate or spring, is attracted by the pole of the electro-magnet to carry the free arm over the gas-tip, and thus break contact, causing the passage of the electric spark. The vibrating permanent magnet which opens and closes the gas-cock is also actuated by the same electro-magnet that operates the circuit-breaker and lights the gas. The gas is shut off by reversing the direction of the current.

My invention further consists of certain details of construction hereinafter described.

In the annexed drawings, Figure 1 is a front elevation of an electric gas-lighting apparatus embodying my invention. Fig. 2 is a side elevation of the same, showing the armature out of contact with the pole of the electro-magnet. Fig. 3 is a rear elevation. Fig. 4 is a side elevation, showing the armature in contact with the pole of the magnet, and showing the circuit broken. Fig. 5 is a sectional detail, showing the gas-cock and the poles of the permanent magnet.

A is an electro-magnet, and *a a* are the poles thereof.

B is a permanent magnet, pivoted at *b*, and having poles *b' b'*. This is a horseshoe-magnet, and curved so as to partially surround the

electro-magnet, the poles at the lower end being connected by a strap, *b''*, which has a lip projecting therefrom having a notch, *b'''*. The gas cock or plug *d* is provided with an arm, *d'*, which engages with the slot *b'''*. The plug *d* is provided with a narrow slot or port, and the communicating passage in the gas-pipe is also a narrow opening, so that a small part of a revolution of the plug is sufficient to open and close the port. This is quite important, as it only requires a limited movement of the horseshoe-magnet to effect the operation of the opening and closing of the cock. The magnet B vibrates upon the pivot *b* when the current passes through the electro-magnet, the poles of magnet B being attracted or repelled by the pole of the electro-magnet in accordance with the direction in which the electric current is passed, and being connected with the gas-cock through the medium of the arm *d'*, it will be seen that the gas-cock may be opened or closed by sending the current in the proper direction. The current-wires *x x* are connected with a reversing push button or key. The battery or other well-known means for generating the current may be placed in the cellar or other convenient place.

C is the circuit-breaker, or "buzzer," as it is sometimes called. It consists of a flat plate or spring, *c*, pivoted to the lower end of the magnet at *c'*, the armature D being fixed at the upper end of the plate, and two flexible arms, E E, having at their ends the electrodes or platinum tips *e e*. These arms are fixed upon the plate *c* and insulated therefrom, and the lower ends thereof are connected with the current-wires, as shown in the drawings. The flexible arms E E are curved at their upper ends, as shown in the drawings, in such a manner that when the armature is attracted by the electro-magnet one of the said arms is brought against the lava tip of the gas-burner, while the other passes over the same, thus breaking the circuit and causing the spark to pass. The circuit-breaker C is pivoted in such a manner that gravity causes it to fall away from the gas-burner when uninfluenced by the attraction of the electro-magnet. Instead of depending on gravity, the same purpose may be accomplished by the arrangement of a spring in any convenient manner.

The whole apparatus is fixed upon the gas-

pipe adjacent to the burner, and may be covered by a shield, F, as shown in section, Fig. 1 of the drawings. From the above description the operation will be readily understood.

5 When it is desired to light the gas the current-wires are connected with the battery by touching the push button or key, which causes a current to pass through the electro-magnet and attract the permanent magnet in the proper
10 direction to open the gas-cock. At the same time the pole of the electro-magnet actuates the circuit-breaker and causes the ignition of the gas by the electric spark, the operation being continued sufficiently long to allow the gas
15 to escape through the aperture in the tip after the turning of the cock. To shut off the gas the current-wires are connected so as to send the current in the reverse direction.

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

1. The combination, with a gas-burner tip, of a circuit-breaker having two flexible arms, E E, curved as shown, one of said arms being
25 adapted to strike against the gas-burner tip, while the other passes over the same, substantially as described.

2. The circuit-breaker C, composed of the plate *c*, pivoted at its lower end and having
30 armature D fixed to its upper end, and the curved flexible arms E E, having the electrodes *e e*, all combined and operating substantially as described.

3. The combination of an electro-magnet, a
35 gas-burner, and a circuit-breaker having two

flexible arms, one of which is adapted to strike against the gas-burner tip, while the other passes over the top thereof, substantially as described.

4. The combination of an electro-magnet, a
40 gas-burner, and a circuit-breaker, said circuit-breaker being pivoted upon the lower end of the electro-magnet, and adapted to carry away its flexible arms and electrodes from the gas-
45 burner tip when its armature is unattracted by the electro-magnet, the combination being and operating substantially as described.

5. The combination of a gas-burner having a gas-cock with a narrow port and an arm, *d'*,
50 an electro-magnet the coil of which surrounds the gas-pipe, and a permanent horseshoe-magnet, pivoted at *b*, curved so as to partly surround the coil of the electro-magnet, and having the depending poles *b' b'*, extending below the coil, and connected by the strap *b''*, provided
55 with a notch, *b'''*, to engage the arm *d'* of the gas-cock, all constructed and combined to operate substantially as described.

6. In an electric gas-lighting apparatus, the combination of a gas-burner, an electro-mag-
60 net, a vibrating permanent horseshoe-magnet, and a circuit-breaker, both arms of which, carrying electrodes, are adapted to vibrate toward and away from the gas-burner tip, the combination being and operating substantially as de-
65 scribed.

OSMON SPEARWATER ARMSTRONG.

Witnesses:

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