

(No Model.)

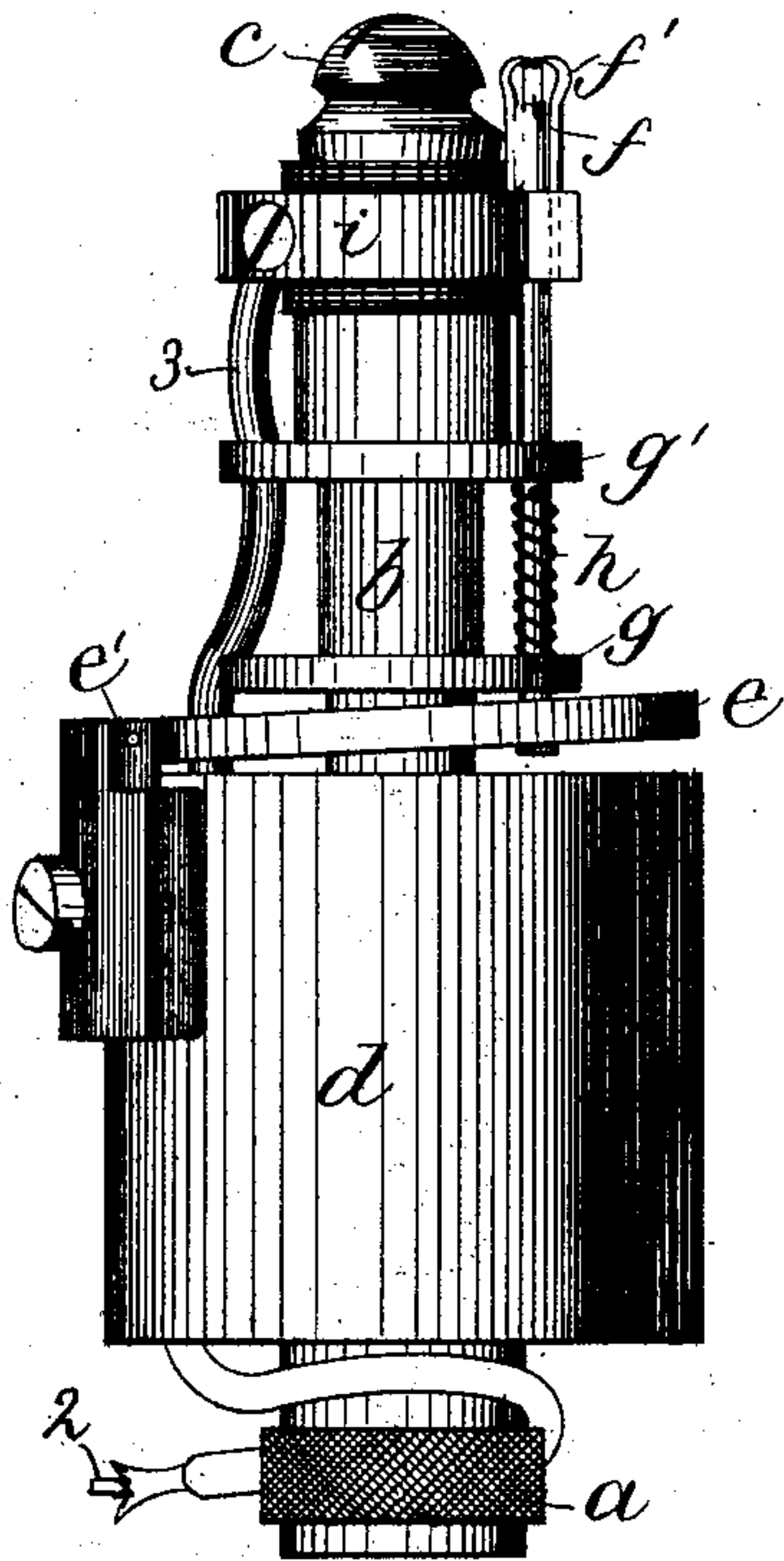
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ELECTRIC GAS LIGHTING APPARATUS.

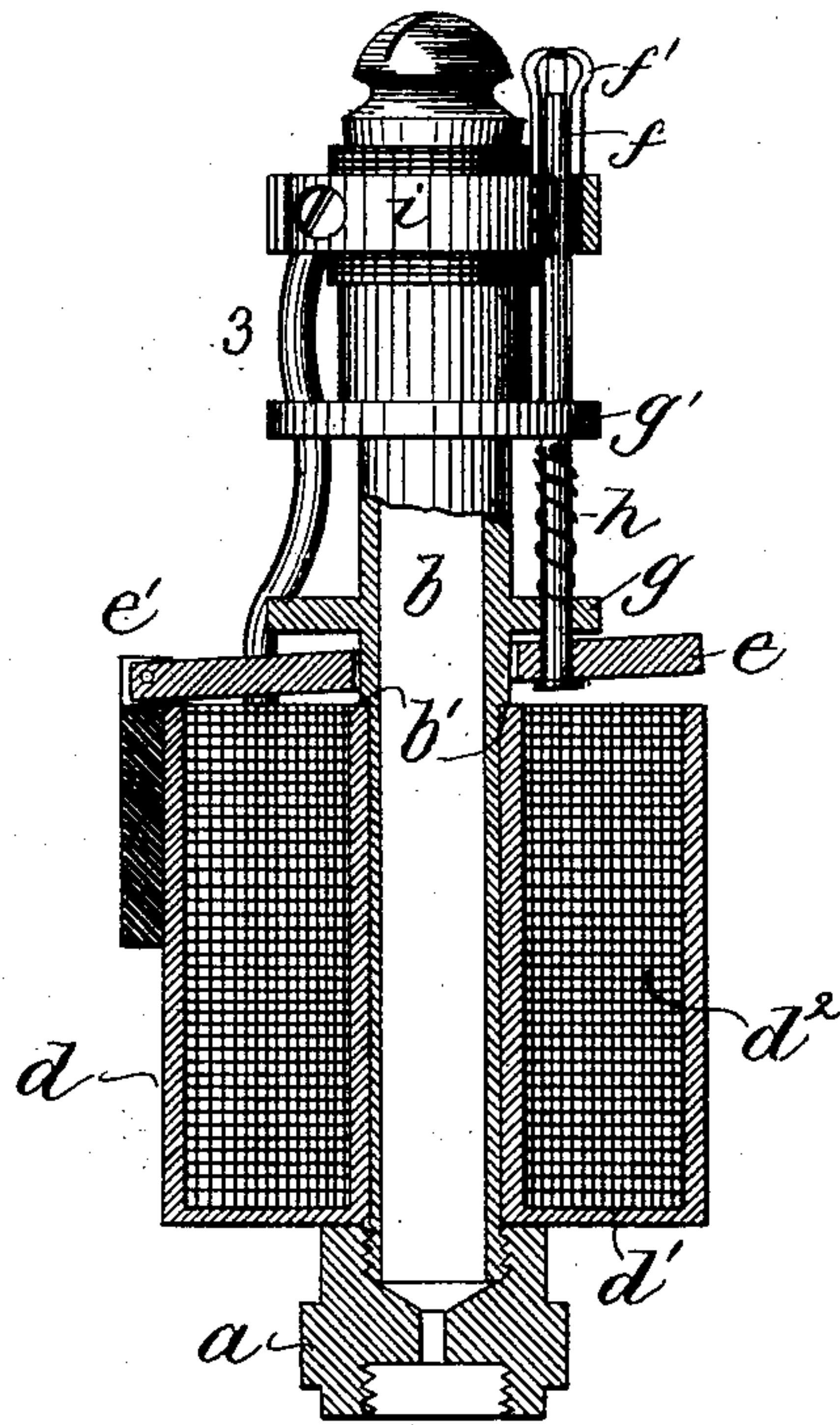
No. 359,053.

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*Fig. 1.*



*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

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## ELECTRIC GAS-LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 359,053, dated March 8, 1887.

Application filed August 23, 1886. Serial No. 211,639. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES B. BOSWORTH, of Everett, county of Middlesex, State of Massachusetts, have invented an Improvement in  
5 Gas-Lighting Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a gas-lighting apparatus of that class in which a vibrating electrode actuated by an electro-magnet is located near the point where the gas issues from the burner, so that the spark produced by the separation of the electrodes ignites the gas.

15 The invention consists, mainly, in a novel construction of the electro-magnet by which the electrode is vibrated and the arrangement of the said magnet with relation to the gasway of the burner and movable electrode or device, the object of the invention being to produce a  
20 powerful magnet which occupies but little space.

The magnets that have heretofore been used in gas-lighting apparatus of this class have  
25 been either horseshoe-magnets, or straight magnets in which the coil is wound upon a central core, both of which kinds of magnets occupy considerable space if made of sufficient power to perform the work required, and thus make  
30 the burner cumbersome.

The present invention is embodied in a burner and lighting device comprising an electro-magnet consisting of a central tubular core and an outer tubular shell concentric with the core  
35 and a coil of wire included between the said central core and outer shell, which are both of magnetic material and magnetically connected at one end, so that their other ends form the poles of the electro-magnet, which is cylindrical in shape and of great power relative to the  
40 space occupied by it. The central tubular core contains the gasway leading to the burner-tip, and the magnet is provided with a disk-shaped armature which acts on a movable electrode or circuit-breaker co-operating with a stationary electrode near the orifice of the burner, the said electrodes being normally retained in contact by a spring, which also holds the armature retracted from its magnet, and the said  
45 armature, when attracted, operating to separate the electrodes, and thus demagnetize the magnet and thereby produce a vibrating movement of the armature and movable electrode in the well-known manner.

Figure 1 is a side elevation of a gas-burner 55 provided with an automatic lighting device embodying this invention; and Fig. 2, a longitudinal section thereof, partly in elevation.

The burner is provided at its base with a threaded thimble or connector, *a*, by which it 60 may be attached to the fixture in the usual manner, the said thimble having a longitudinal passage through it and having connected with it the tubular gasway *b*, that terminates in the tip *c*, which may be of usual construction. 65

Surrounding the lower portion of the gasway *b* is the electro-magnet *d*, which consists of a central tubular core and outer concentric shell made integral or connected at their base by a magnetic flange or disk, *d'*, as shown in Fig. 70 2, so that when the annular space between the said inner and outer shell is filled with the coil of wire (indicated at *d''*) the said device constitutes an electro-magnet, of which the upper ends of the concentric cylinders form the poles. 75 The magnet *d* is held in place on the tube *b* between a shoulder, *b'*, on the said tube and the piece *a*. Co-operating with the said magnet *d* is an armature, *e*, pivoted at *e'* upon a non-magnetic bracket connected with the mag- 80 net *d*, as best shown in Fig. 1, the said armature being circular in shape and having a central opening through which the gas-tube *b* passes, as clearly shown in Fig. 2.

The armature *e* engages a movable electrode, 85 *f*, constituting one member of a circuit-breaker, the other member, *f'*, of which is insulated from the burner. The electrode *f* consists of a rod having a sliding movement in flanges *g*, projecting from the burner-tube *b*, as shown, 90 and it is normally held in contact with the other electrode, *f'*, by a spring, *h*, which also serves to retain the armature *e* retracted.

The device is connected in circuit and operated in substantially the same manner as usu- 95 ally practiced with gas-lighting devices of this class—namely, one terminal of the coil *d''* of the actuating magnet is connected with wire 2, (see Fig. 1,) which comes from the battery, and includes a circuit-closer at the point from 100



which the lighting device is to be operated, the other pole of the battery being grounded or connected with the gas-pipes. The other terminal of the coil  $d'$  of the magnet is connected by wire 3 with the insulated collar  $i$ , that supports and is electrically connected with the electrode  $f'$  of the circuit-breaker, the other or movable electrode,  $f$ , of which is insulated from the said collar  $i$ , but electrically connected with the burner, and thus, through the piping, with the opposite pole of the battery from that connected with the wire 2. Thus, when the circuit is closed externally to the device, the magnet  $d$  is energized, attracts its armature  $e$ , which thus separates the electrodes  $f f'$ , and produces a spark. The separation of the electrodes and interruption of the current demagnetizes the armature and permits the electrodes to be again placed in contact, when the operation is repeated and a vibrating movement of the armature  $e$  and electrode  $f$  is maintained in the well-known manner, producing a series of sparks by which the gas is lighted.

The coil of the magnet is inclosed within the outer shell or member of the magnet-core, which may have its surface finished in any desired manner, thus affording an appropriate finish for the entire burner and enabling the inclosing-shells that are usually employed to cover the magnet and operative parts to be dispensed with.

I claim—

An electric gas-lighting device comprising an electro-magnet having concentric tubular cores and a coil between the same, the gasway passing through the central core, combined with an armature and circuit-breaker, one electrode of which is actuated by the said armature, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. B. BOSWORTH.

Witnesses:

JOS. P. LIVERMORE,  
H. P. BATES.