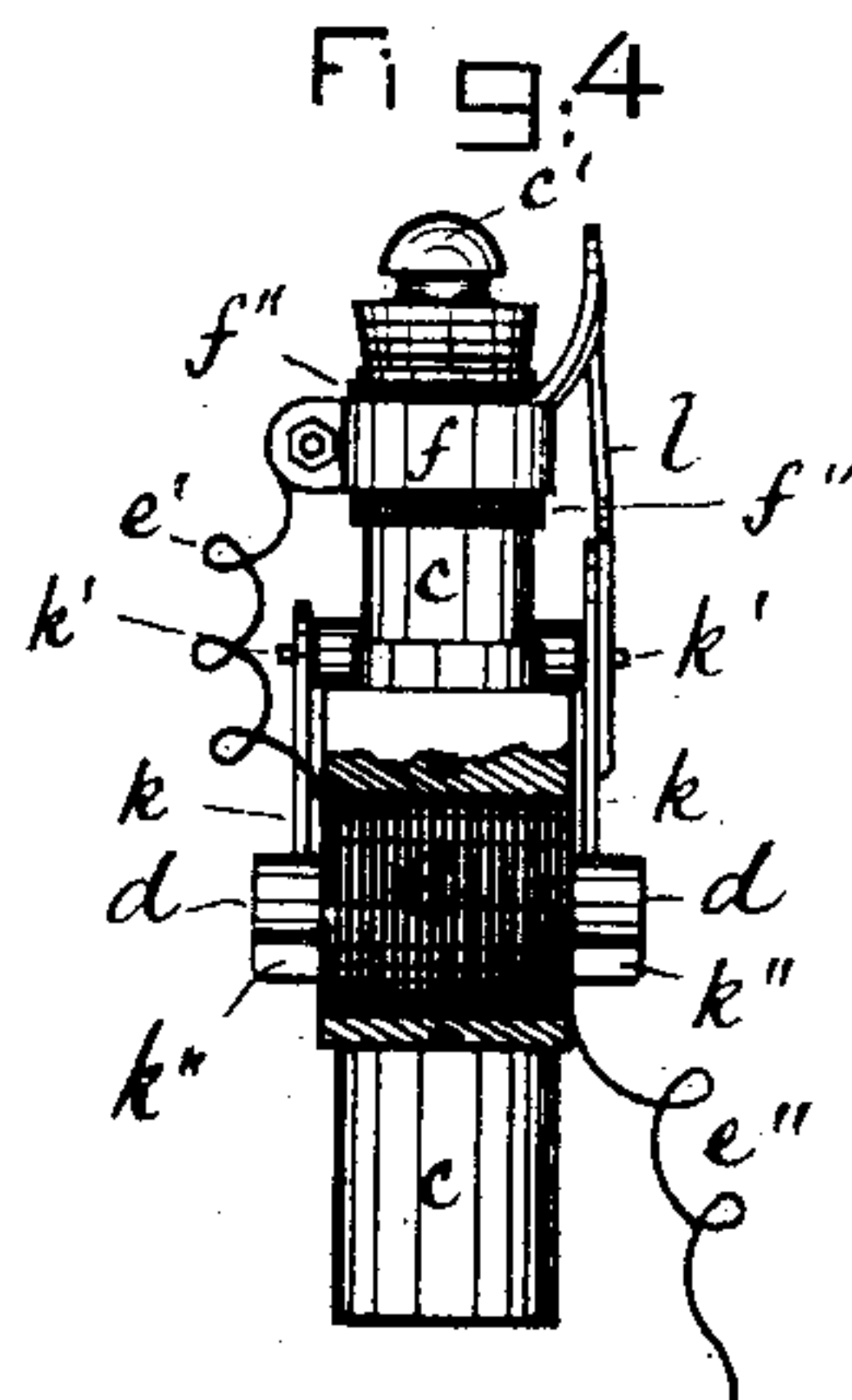
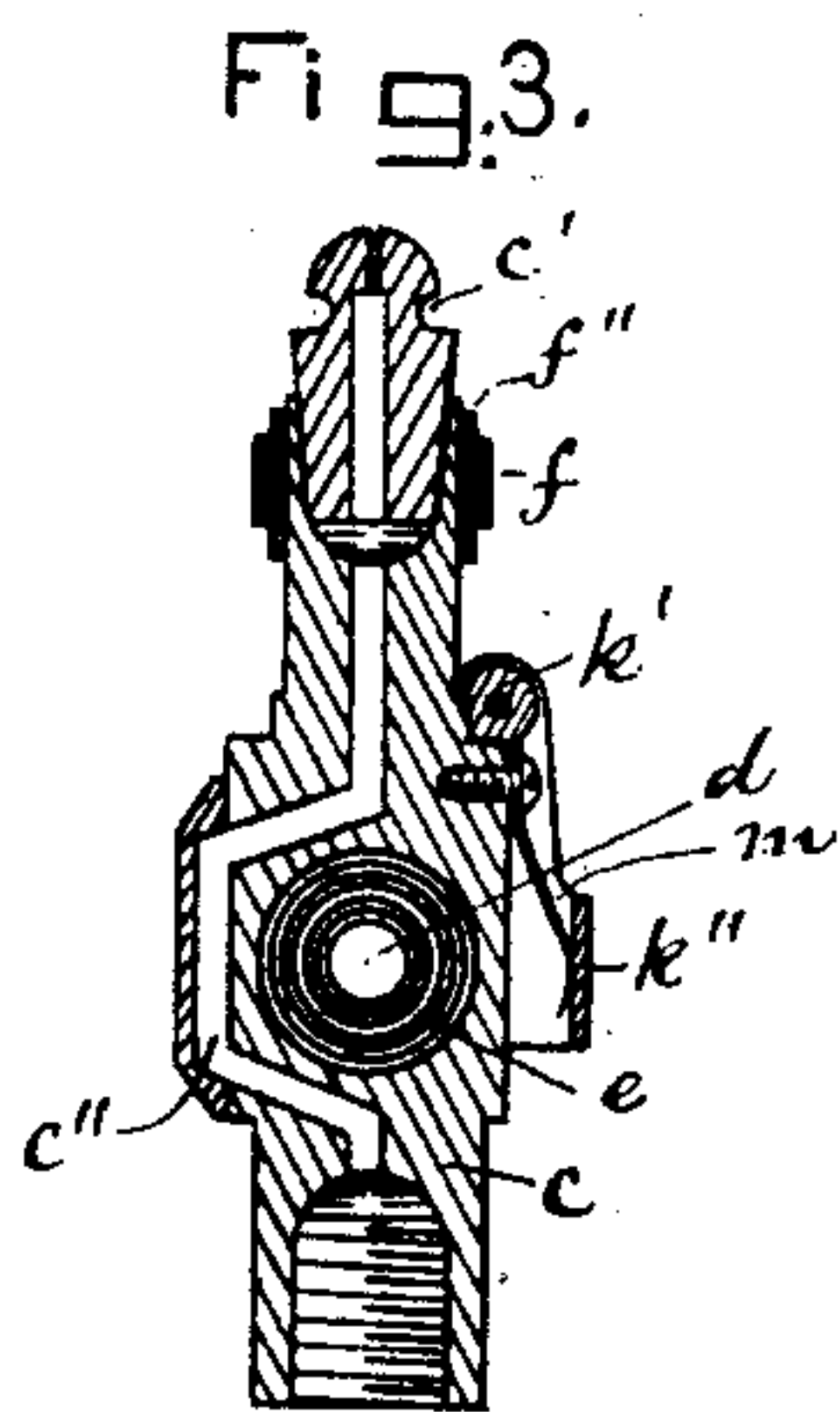
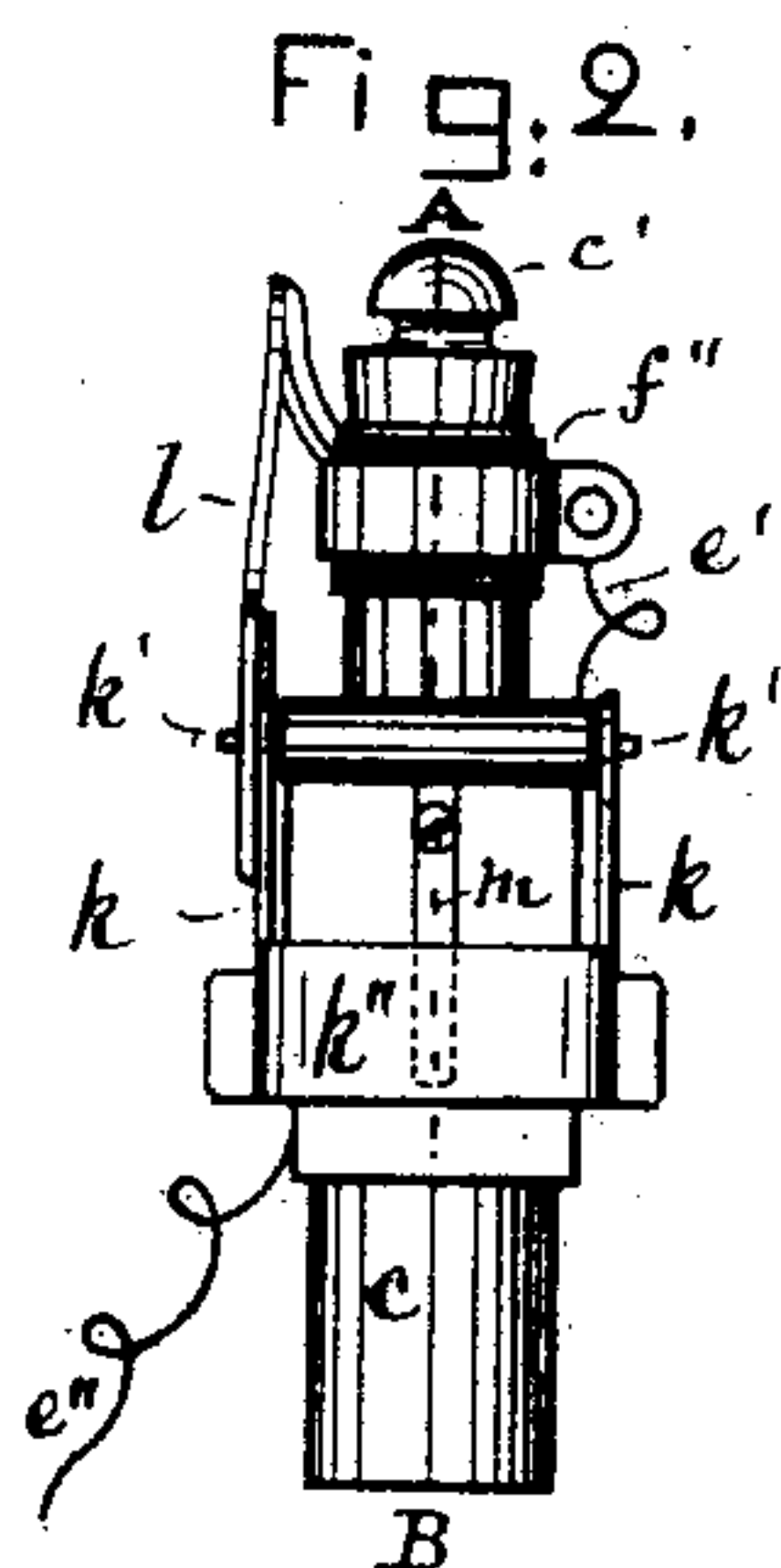
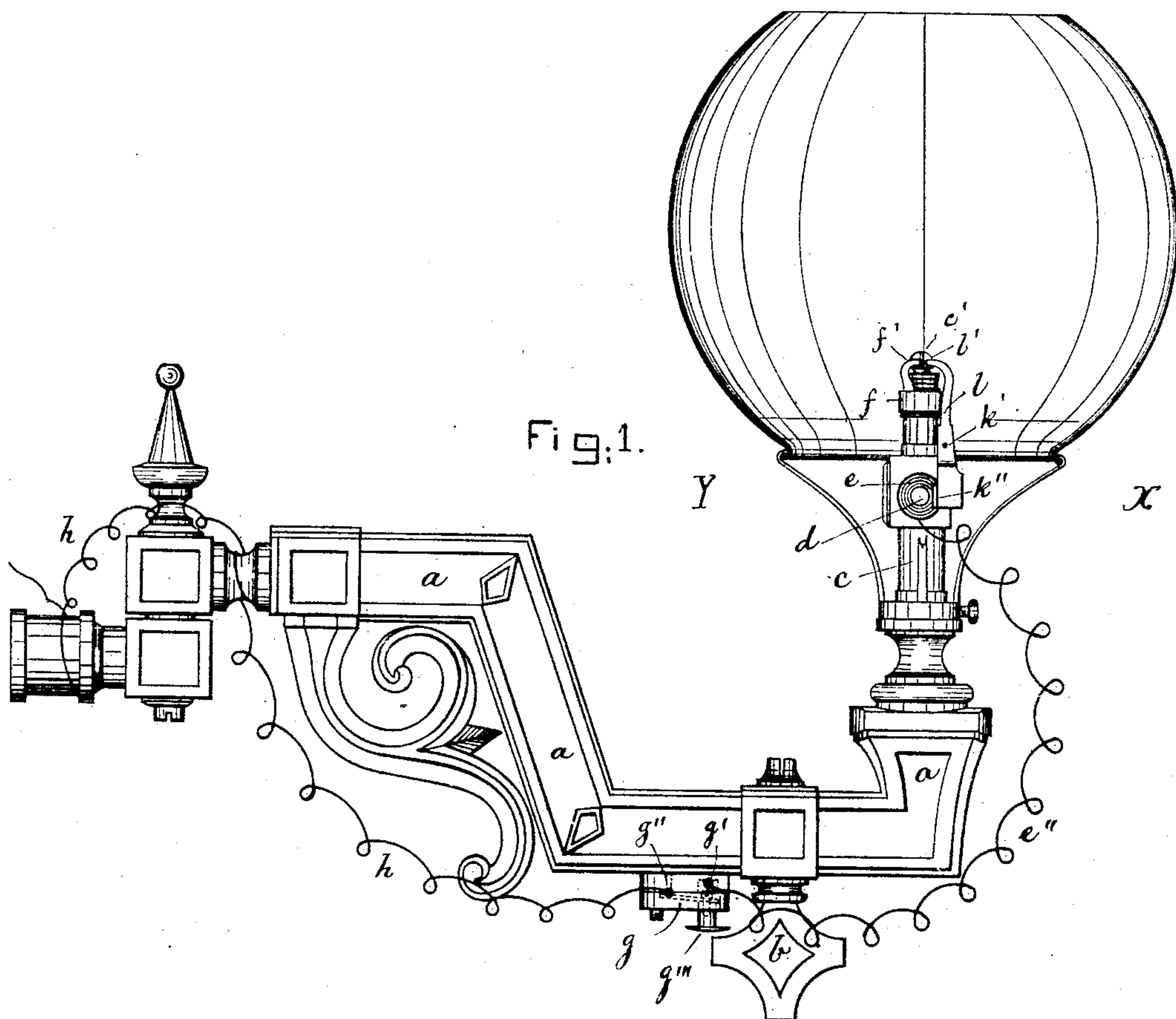


(No Model.)

J. P. TIRRELL.
ELECTRIC GAS LIGHTING APPARATUS.
No. 260,805. Patented July 11, 1882.



Witnesses.

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UNITED STATES PATENT OFFICE.

JACOB P. TIRRELL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE ELECTRIC GAS LIGHTING COMPANY, OF PORTLAND, MAINE.

ELECTRIC GAS-LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 260,805, dated July 11, 1882.

Application filed January 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, JACOB P. TIRRELL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Gas-Lighting Apparatus; and I do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

This invention relates to improvements in electric gas lighting apparatus; and it is particularly designed and adapted for chandeliers and brackets, although it may be used for other purposes.

The invention is carried out as follows, reference being had to the accompanying drawings, on which Figure 1 represents a side elevation of the invention as applied to a bracket. Fig. 2 represents an end elevation of the burner as seen from X in Fig. 1. Fig. 3 represents a longitudinal section of the burner on the line A B, shown in Fig. 2; and Fig. 4 represents an end elevation of the burner as seen from Y in Fig. 1.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

a represents a gas-bracket or a chandelier-arm, as usual, on which *b* is the key of the cock.

c is the burner at the end of the bracket *a*, and *c'* is the tip at the upper end of the burner *c*, as shown.

c'' is the gas-passage within the burner *c*. Within the body of the burner *c* is located the horizontal soft-iron core *d*, surrounded with the electrical coil or helix *e*, having one of its end wires, *e'*, leading to the insulated metal ring *f* at the top of the burner *c*, and its other end wire, *e''*, leading to the switch-pole *g'* on the switch *g*, which latter is located upon and secured to the bracket *a* in close proximity to the key *b*, as shown in Fig. 1. The other pole, *g''*, of the switch *g* is connected to wire *h*, leading from a suitable spark coil and electric battery.

g''' is a spring push-button on the switch *g*, as usual, by pressure on which the poles *g'*

and *g'* can be connected together in electrical connection to convey the current from wire *h* to wire *e''*, leading to the electro-magnet *d* in the body of the burner, and from thence to the insulated ring *f* and its platinum point *f'*.

At *k'* on the burner *c* are hinged the downwardly-projecting armature-levers *k k*, to the lower ends of which is secured the horizontal armature *k''*, the outer ends of which are located opposite to the extreme ends of the electro-magnetic core *d*, which latter project in each end beyond the coil *e* and the width of the burner *c* at this place, as seen in Fig. 4.

f'' is the insulating material, located between the top of burner *c* and the metallic ring *f*. One of the armature-levers *k* projects upward, as a lever, *l*, having platinum electrode *l'* in its upper end opposite to the insulated electrode *f'*, as shown in Fig. 1.

m is a tight spring, secured in its upper end to the outside of the burner *c*, and pressing outward in the lower end against the armature *k''*, as shown in Figs. 2 and 3, so as to keep the said armature away from core *d*, as well as to keep the electrodes *f' l'* in contact with each other when the wires *h* and *e''* are not in electrical connection. The advantage of having the switch *g* secured to the arm or bracket *a* in close proximity to the key *b* is that both the latter and push-button *g'''* can be operated with one single hand to turn on the gas and to send the electric current to the electrodes at the tip *c'*, where it ignites the gas by sparks passing between the electrodes in breaking the circuit. The same advantage is obtained in case the key *b* is turned on by means of the ordinary fork instead of by hand direct.

The operation of this my improved gas-lighting apparatus is as follows: To light the gas the key *b* is first turned to admit the gas to the tip of the burner, as usual. With one finger of the hand the button *g'''* is at the same time pushed to connect the wire *h* from the battery and spark-coil to the wire *e''*, coil *e*, wire *e'*, and electrode *f'*, which, being in contact with the electrode *l'*, completes the circuit and renders the core *d* magnetic, causing the armature *k''* to be attracted to its ends, and in so doing the lever *l* is rocked on its fulcrum *k'*

and the current broken between the electrodes $f' l'$, producing a spark at this place, by which the gas is ignited. As soon as the current is broken at the points $f' l'$, the core d loses its magnetic attraction, and the lever l is turned on its fulcrum k' by the influence of the spring m , so as to bring the point l' in metallic connection with the point f' , and in so doing the circuit is closed and the core d made magnetic, so as to attract the armature k'' and to break the current between the points f' and l' , again producing a spark at this place; and as long as the wires h and e'' are connected by pressure on the switch-button g''' an intermittent motion of the armature k'' to and from the electro-magnetic core d and an intermittent motion of the lever $l l'$ to and from the electrode f' are produced, causing intermittent sparks to pass between the electrodes $f' l'$ at the tip of the burner for the ignition of the escaping gas. When the gas is ignited the operator withdraws the pressure on the spring-button g''' , by which means the metallic connection of wires $h e''$ is broken. The core d , losing its magnetic attraction, permits the lever l to be turned on its fulcrum k by the influence of the spring m , so as to bring the electrodes $f' l'$ in contact with each other, which is the normal position of said parts. The gas is turned off, as usual, by manipulating the key b .

I am aware of the patents granted respectively to Smith, June 23, 1874, No. 152,427, and to Drysdale, August 16, 1881, No. 245,799. In the Smith patent the cock is the operative mechanism or switch, by the turning of which the current of electricity is conveyed to the burner to ignite the gas; but in my invention the stop-cock is entirely independent of the electric circuit, and the gas may, if so desired, be lighted by a match, as usual, there being no connection between my gas-cock and the electrodes. In the Smith patent a coil is used around the body of the burner and not hori-

zontally through it, as shown in my present application. It will also be seen by reference to my drawings that I use an independent push-button or switch in proximity to the key of the gas-cock, which button or switch is operated independently of the key of the gas-cock. In the Drysdale patent is shown a permanent magnet combined with an electro-magnet and a secondary coil, and the stop-cock is operated electrically. In my invention I do not use a permanent magnet combined with an electro-magnet and a secondary coil. Neither is the stop-cock operated electrically, as in said Drysdale's invention.

I claim—

1. In an electric gas-lighting apparatus, the combination of burner a , horizontal electro-magnet $d e$ in the body of said burner, the vibratory armature k'' , with its lever $l l'$, insulated electrode $f f'$, and wire $e' e''$, to the switch g , as and for the purpose set forth.

2. In an electric gas-lighting apparatus, the combination of burner c , and arm or bracket a , having the switch g arranged and secured upon it, and located in relation to the key b , as and for the purpose set forth.

3. The combination of gas-burner c , vibrating arm or lever l , electro-magnet $d e$, arm a of bracket or chandelier, wire $h e''$, and switch g , located at the key b , all arranged and operated in a manner as described.

4. The combination of gas-burner c , ring-electrode $f f'$, vibrating arm $l l'$, having armature k'' in its lower end, and the horizontal electro-magnet $d e$, located in the body of said burner c , as and for the purpose set forth.

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

JACOB P. TIRRELL.

Witnesses:

ALBAN ANDRÉN,
HENRY CHADBOURN.