

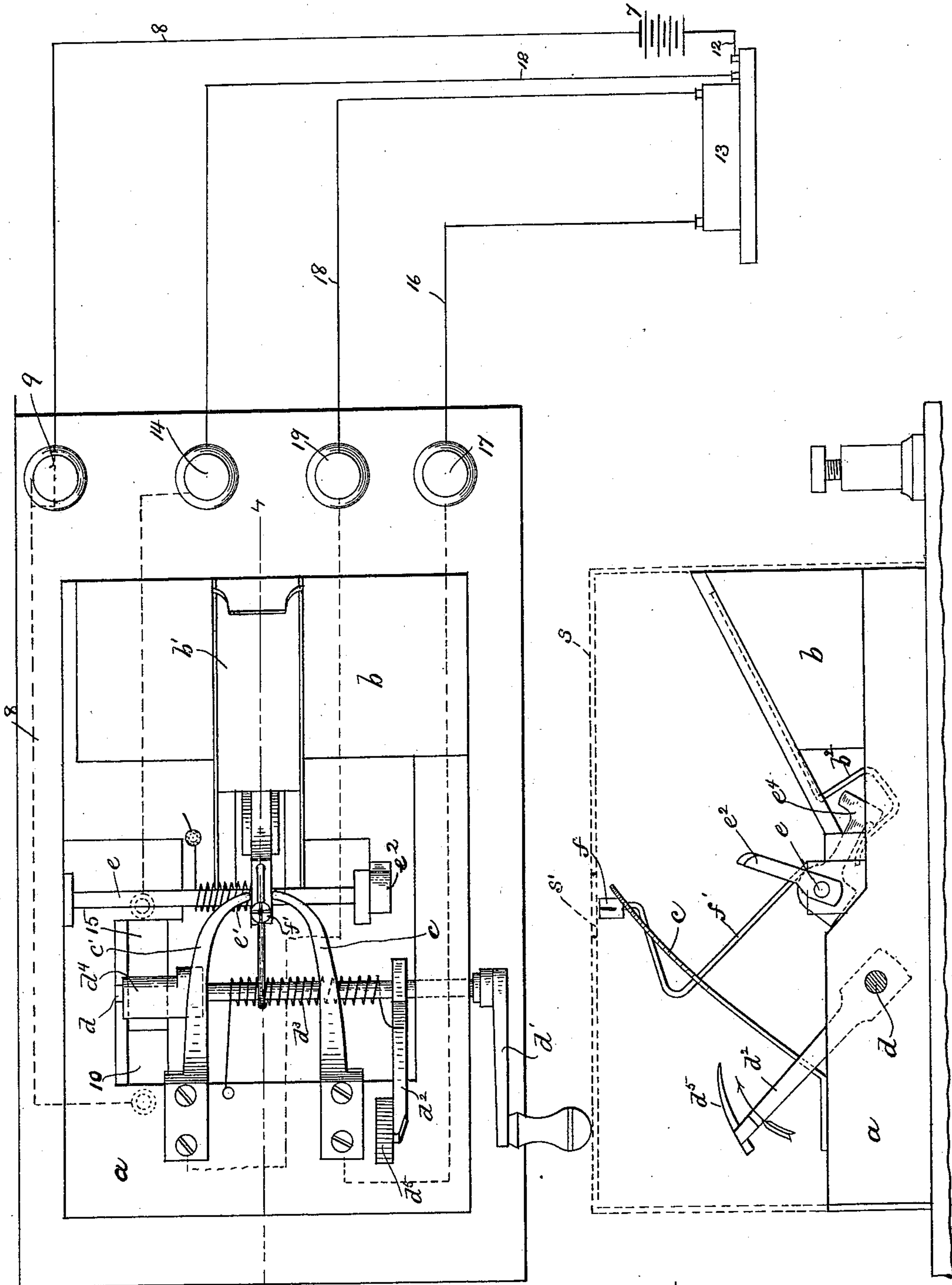
(No Model.)

2 Sheets—Sheet 1.

W. W. FOSTER.
ELECTRIC CIGAR LIGHTING APPARATUS.

No. 463,384.

Patented Nov. 17, 1891.



WITNESSES:
Ewing W. Hamlen.
A. S. Harrison.

INVENTOR:
W. W. Foster
by M. H. Brown, Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

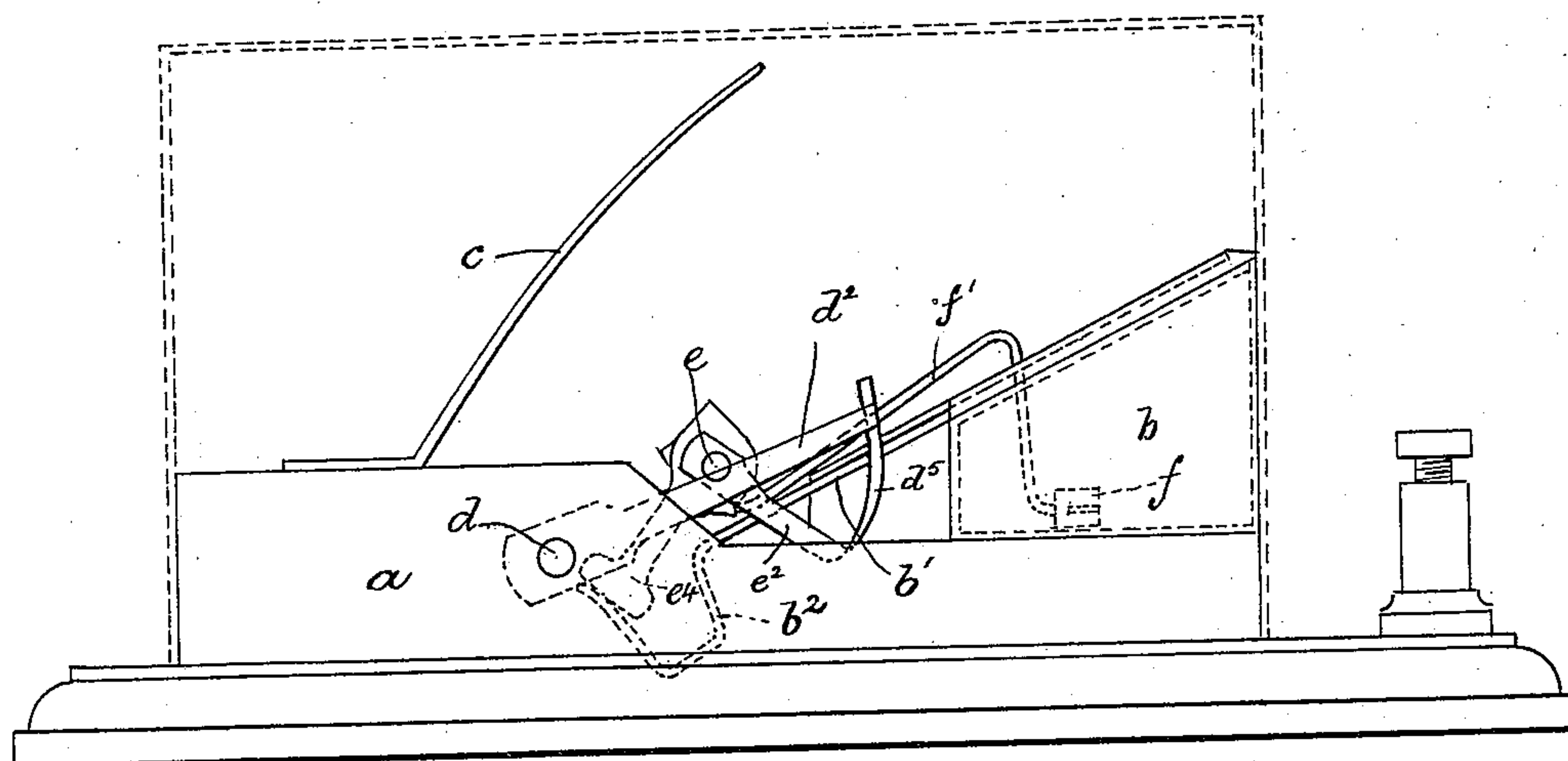


Fig. 4.

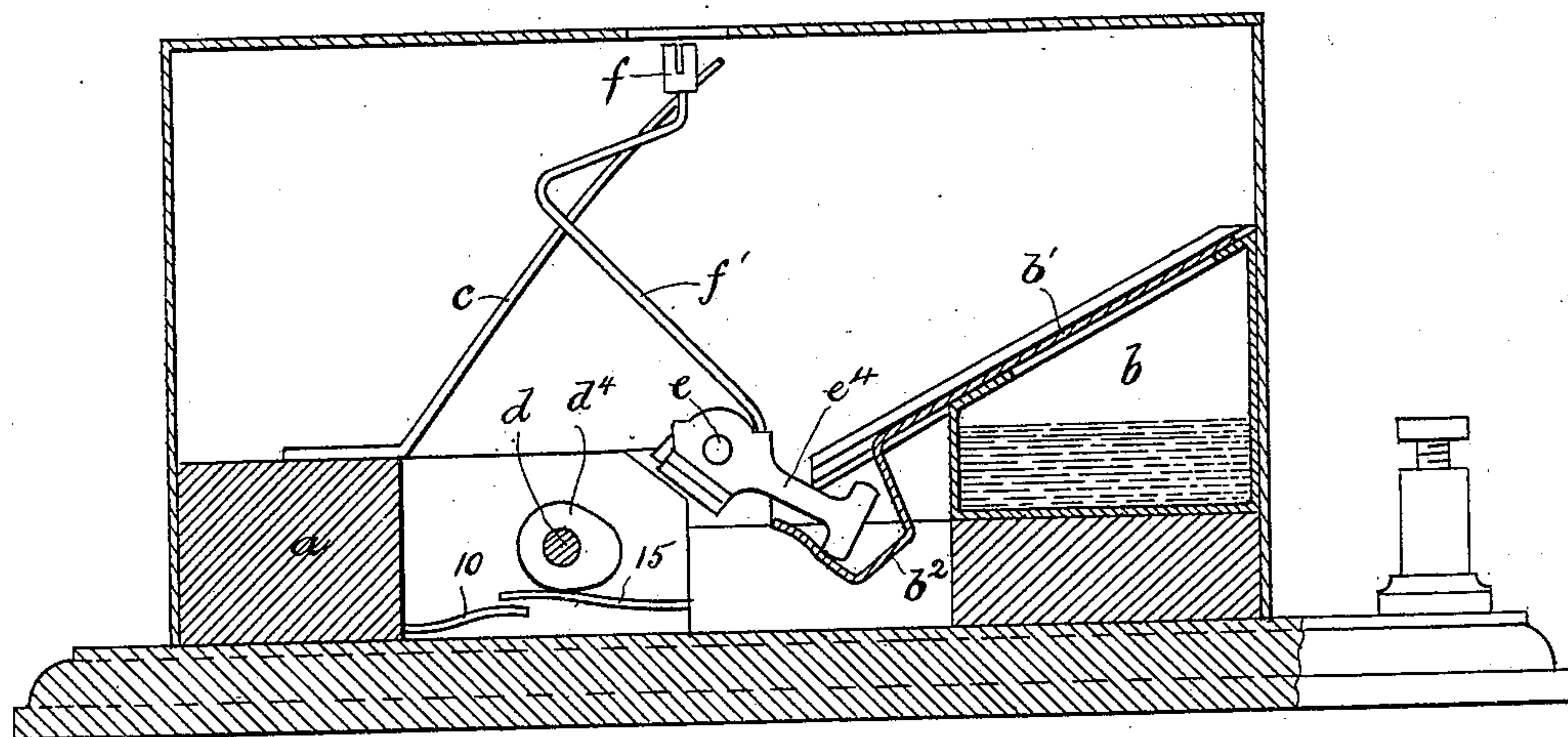
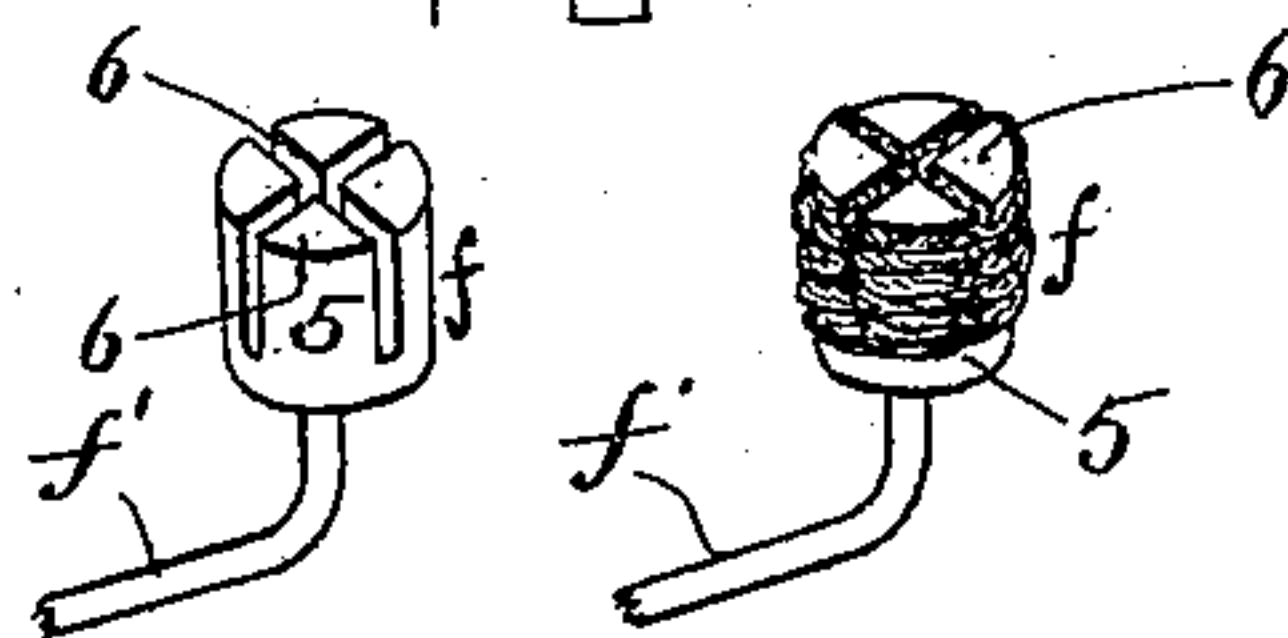


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM W. FOSTER, OF BOSTON, MASSACHUSETTS.

ELECTRIC CIGAR-LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 463,384, dated November 17, 1891.

Application filed August 14, 1891. Serial No. 402,639. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. FOSTER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Cigar-Lighting Apparatus, of which the following is a specification.

This invention has for its object to provide means for utilizing a continuous spark, such as is produced by the action of an induction-coil for igniting alcohol or other inflammable material, and particularly to produce a cigar-lighting apparatus comprising means for producing a continuous spark, and a movable torch which is alternately immersed in alcohol or other inflammable fluid and moved into position to be acted on by the spark when the latter is formed, the spark igniting the alcohol.

The invention consists in the improvements which I will now proceed to describe and claim.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a top plan view of a cigar-lighting apparatus embodying my invention, the electrical connections being shown in diagram. Fig. 2 represents a side elevation of the apparatus shown in Fig. 1. Fig. 3 represents a side elevation showing the torch immersed in the alcohol-tank. Fig. 4 represents a section on line 4 4 of Fig. 1. Fig. 5 represents perspective views of the torch.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings, *a* represents a supporting frame or base, to which is suitably affixed a tank *b*, adapted to contain alcohol or other suitable inflammable liquid.

c c' represent two electrodes, each affixed at one end of the base *a*, the free ends or terminals of said electrodes being in such proximity to each other that a continuous spark—such as is produced by the action of an induction or Ruhmkorff coil—will pass freely from one of said terminals to the other.

d represents a shaft mounted in suitable bearings in the base *a* and adapted to be rocked or oscillated by means of a crank or handle *d'*.

e represents another shaft, journaled in bearings on the base *a* and arranged parallel

with the shaft *d*. To the shaft *e* is affixed an arm *f'*, the outer end of which carries a torch *f*, which is adapted to be immersed in the liquid in the tank *b* by a movement of the shaft *e* in one direction. Said torch may be of any suitable construction, and is preferably composed of a block 5, of hard rubber or other insulating material, provided with intersecting slots 6 6, and strips of asbestos wound about the arms or divisions into which the block 5 is converted by said slots 6, the block being attached to the arm *f'*. The object of this construction is to present a considerable quantity of absorbent refractory material to the spark that is formed between the electrodes *c c'*, as hereinafter described, without making the torch of a material or materials which will conduct electricity. In this case the asbestos constitutes the absorbent refractory material and the insulating-block 5 constitutes a non-conducting support or holder for said absorbent material. When the shaft *e* is held in its normal position by the action of a spring *e'*, attached at one end to the shaft *e* and at the other end to the base *a*, the torch *f* stands in such proximity to the terminals of the electrodes *c c'* that the alcohol carried by the torch will be ignited when a spark is formed between said electrodes, the shaft being adapted to move from its normal position far enough to permit the torch to enter the tank *b*, as indicated in Fig. 3.

Means are provided for moving the shaft *e* to insert the torch in the tank and for releasing said shaft to permit the spring *e'* to throw the torch to its normal position. Means are also provided for closing a primary electric circuit before the release of the torch and for breaking said circuit after the torch has sprung back to its normal position, the circuit being connected with a secondary or induced circuit, including an induction-coil and the electrodes *c c'*, the arrangement being such that upon the closing of the primary circuit the induced current in the secondary circuit is caused by the well-known action of the induction-coil to form a continuous spark between the terminals of the electrodes *c c'* of sufficient duration to ignite the torch, the latter being at this time in close proximity to

the spark, so that the alcohol contained in the torch will be vaporized and ignited by the heat of the spark.

In Fig. 1 I show a diagram of the electrical connections, in which the primary circuit includes a battery 7, a wire 8, extending from one pole of the battery through a binding-post 9 to a contact-spring 10, attached to the base *a*, another wire 12, extending through the primary of a Ruhmkorff or induction coil 13 and binding-post 14 to a movable contact-spring 15, which is attached to the base *a*, and is adapted to make contact with and be separated from the contact-spring 10, said spring 15 being normally separated from the spring 10, so that the primary circuit is normally broken. The secondary circuit includes a wire 16, extending from one end of the secondary of the coil 13 through a binding-post 17 to the electrode *c*, and another wire 18, extending from the other end of the secondary of the coil 13 through a binding-post 19 to the electrode *c'*.

The best means known to me for forcing the torch into the alcohol and then releasing it, and for closing and breaking the primary circuit, comprise the shaft *d*, the arm *d*² on said shaft, an arm *e*² on the shaft *e*, adapted to co-operate with the arm *d*², as presently described, when said arm *d*² is moved forward from its normal position, (shown in Figs. 1 and 2,) a spring *d*³, adapted to return the shaft *d* and arm *d*² to their normal position, and a cam *d*⁴, of insulating material, affixed to the shaft *d* and located over the contact-spring 15, said cam being formed to depress the spring 15 and close the primary circuit when the shaft *d* is moved from its normal position, said cam releasing the spring 15 and breaking the primary circuit when the shaft *d* returns to its normal position. The arm *d*² is provided at its swinging end with a finger *d*⁵, the forward end of which is arranged to strike the outer end of the arm *e*² on the shaft *e* when the arm *d*² is moved forward. The contact of the finger *d*⁵ with the arm *e*² causes the shaft *e* to swing over and insert the torch in the tank *b*, as shown in Fig. 3.

The operation is as follows: When it is desired to ignite the torch, the operator grasps the handle of the crank *d*¹ and turns the same so as to make the arm *d*² move in the direction indicated by the arrow in Fig. 2. When the finger *d*⁵ of the arm *d*² reaches the arm *e*² of the torch-carrying shaft *e*, said shaft is rotated in the same direction and the torch is thrown forward and downward into the tank. The movement of the shaft *d*, involved in throwing the torch into the tank, causes the insulating-cam *d*⁴ to depress the contact-spring 15 and close the primary circuit, thereby inducing a current in the secondary circuit by the action of the coil 13, in a manner well understood by those skilled in the art. The finger *d*⁵ is formed so that when the arm *d*² is in the position shown in Fig. 3 the inner or under side of said finger, which is formed

on the arc of a circle, is substantially concentric with the shaft *e*, so that when the point of the finger *d*⁵ is carried outside of the radius of the arm *e*² by a continuation of the forward movement of the arm *d*² the arm *e*² will remain in the position shown in Fig. 3 until the heel or rear end of the finger *d*⁵ passes below the point of said arm, and when this occurs the arm *e*² is released and returned to its normal position by the spring *e*¹, while the circuit is closed and the spark is passing from one electrode to the other. The object of this construction is to release the torch and permit it to pass into suitable proximity to the electrodes before the primary circuit is broken by the backward movement of the shaft *d*, thus insuring the ignition of the alcohol by the spark. The operator then releases the crank *d*¹, whereupon the spring *d*³ returns the shaft *d*, arm *d*², and cam *d*⁴ to their normal position, the primary circuit being broken by the movement of the cam *d*⁴, so that the spark ceases to pass between the electrodes.

I have found that the continuous spark, such as is formed by the action of a Ruhmkorff or induction coil, is particularly adapted to igniting alcohol or other like inflammable matter, because of the intensity of the heat produced by said spark, so that a cigar-lighting apparatus provided with means for producing a continuous spark, as above described, is much more reliable than apparatuses for the same purpose in which a spark is caused by the separation of two electrodes. I do not limit myself, however, to the use of a Ruhmkorff or induction coil, as a continuous spark may be produced by the use of an alternating current generated in any suitable manner.

To prevent evaporation of the alcohol in the tank I provide the opening through which said torch enters the tank with a sliding door *b'*, which is engaged with an arm *e*⁴ on the shaft *e*, said arm being arranged so that when the shaft *e* is moved to insert the torch in the tank the door *b'* will be displaced so as to uncover the opening for the admission of the torch, as shown in Fig. 3. The lower end of the sliding door is provided with an offset *b*², having three sides, the outer end of the arm *e*⁴ playing between the sides of said offset, as indicated in Figs. 2, 3, and 4, so that when the shaft *e* is rotated in one direction to throw the torch into the tank the door is opened, and when the shaft *e* is rotated in the opposite direction to elevate the torch the door is closed.

I prefer to inclose the described mechanism by a cover *s*, which may be of sheet metal or other suitable material, formed to fit upon the base *a*, as shown in dotted lines in Fig. 2, said cover having an aperture at *s'* directly over the torch when the latter is in its normal position.

I do not limit my invention to apparatuses for lighting cigars, as the principle herein described may be applied to the ignition of fuel or combustible material for various other purposes.

I claim—

1. The combination of two fixed electrodes, means for producing a continuous spark between said electrodes, and a movable torch or fuel carrier adapted to occupy such position relatively to said electrodes as to be ignited by the said spark, said torch being pivoted to swing into or out of the space between the electrodes in a plane substantially at a right angle to the line of the two electrodes, as set forth.

2. The combination of two electrodes, means for producing a continuous spark between said electrodes, a fuel-reservoir, and a swinging torch adapted to oscillate between said reservoir and electrodes, said torch being in the reservoir when at one extreme of its movement and in operative proximity to the electrodes when at the other extreme of its movements, as set forth.

3. The combination of two electrodes, a fuel-reservoir, a swinging torch adapted to oscillate between said reservoir and electrodes, means for oscillating said torch to throw it alternately into the reservoir and between the electrodes, an electric circuit including said electrodes, means for forming a continuous spark, and a circuit breaking and closing device arranged to be operated by the mechanism that moves the torch, the circuit being closed when the torch is moved away from the electrodes and broken after the return of the torch to the electrodes, as set forth.

4. The combination of two electrodes, a fuel-reservoir, a swinging torch adapted to oscillate between said reservoir and electrodes, means for oscillating said torch to throw it alternately into the reservoir and between the electrodes, a primary electric circuit including the primary of an induction-coil, and a circuit closing and breaking device, the latter being operated to close the primary circuit when the torch is moved away from the electrodes and to break said circuit after the torch has returned to the electrodes, and a secondary circuit including the said electrodes and the secondary of the induction-coil, whereby a continuous spark is produced between the electrodes when the primary circuit is closed, as set forth.

5. The combination of two electrodes, a fuel-reservoir, a swinging torch adapted to oscillate between said reservoir and electrodes, a rock-shaft supporting said torch and provided with a spring which normally holds the torch between the electrodes, another rock-shaft having an arm, a crank or handle, a circuit breaking and closing cam, and a spring which normally holds the shaft

and cam in the circuit-breaking position of the latter, said arm being formed to engage an arm on the torch-carrying shaft and first move and then release the torch, a primary electric circuit including a movable contact-spring and a contact-piece co-operating therewith in closing the said circuit, said spring being normally in position to break the circuit and arranged to be moved by said cam to close the circuit, the primary of an induction-coil included in said circuit, and a secondary circuit including the two electrodes and the secondary of the induction-coil, all arranged and operating substantially as set forth.

6. The combination of two electrodes, a fuel-reservoir, a swinging torch adapted to oscillate between said reservoir and electrodes, a rock-shaft *e*, supporting said torch and provided with a spring which normally holds the torch between the electrodes and with an arm *e*², and another rock-shaft *d*, having a crank or handle, a spring impelling said rock-shaft in one direction, and an arm *d*², formed to engage the said arm *e*² when the rock-shaft *d* is turned against the pressure of its spring, said arm *d*² being constructed to first depress and then release the arm *e*², as set forth.

7. The combination of two electrodes, a fuel-reservoir, a swinging torch adapted to oscillate between said reservoir and electrodes, a rock-shaft *e*, supporting said torch and provided with a spring which normally holds the torch between the electrodes and with an arm *e*², another rock-shaft *d*, having a crank or handle, a spring impelling said rock-shaft in one direction, and an arm *d*², formed to engage the said arm *e*² when the rock-shaft *d* is turned against the pressure of its spring, said arm *d*² being constructed to first depress and then release the arm, a slide or door formed to cover the opening through which the torch enters the tank, and an arm *e*⁴, affixed to the shaft *e* and engaged with said slide, said arm and slide being arranged so that the arm holds the slide in its closed position when the torch is between the electrodes and in its opened position when the torch is in position to enter the reservoir, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 10th day of August, A. D. 1891.

WILLIAM W. FOSTER.

Witnesses:

C. F. BROWN,

A. D. HARRISON.