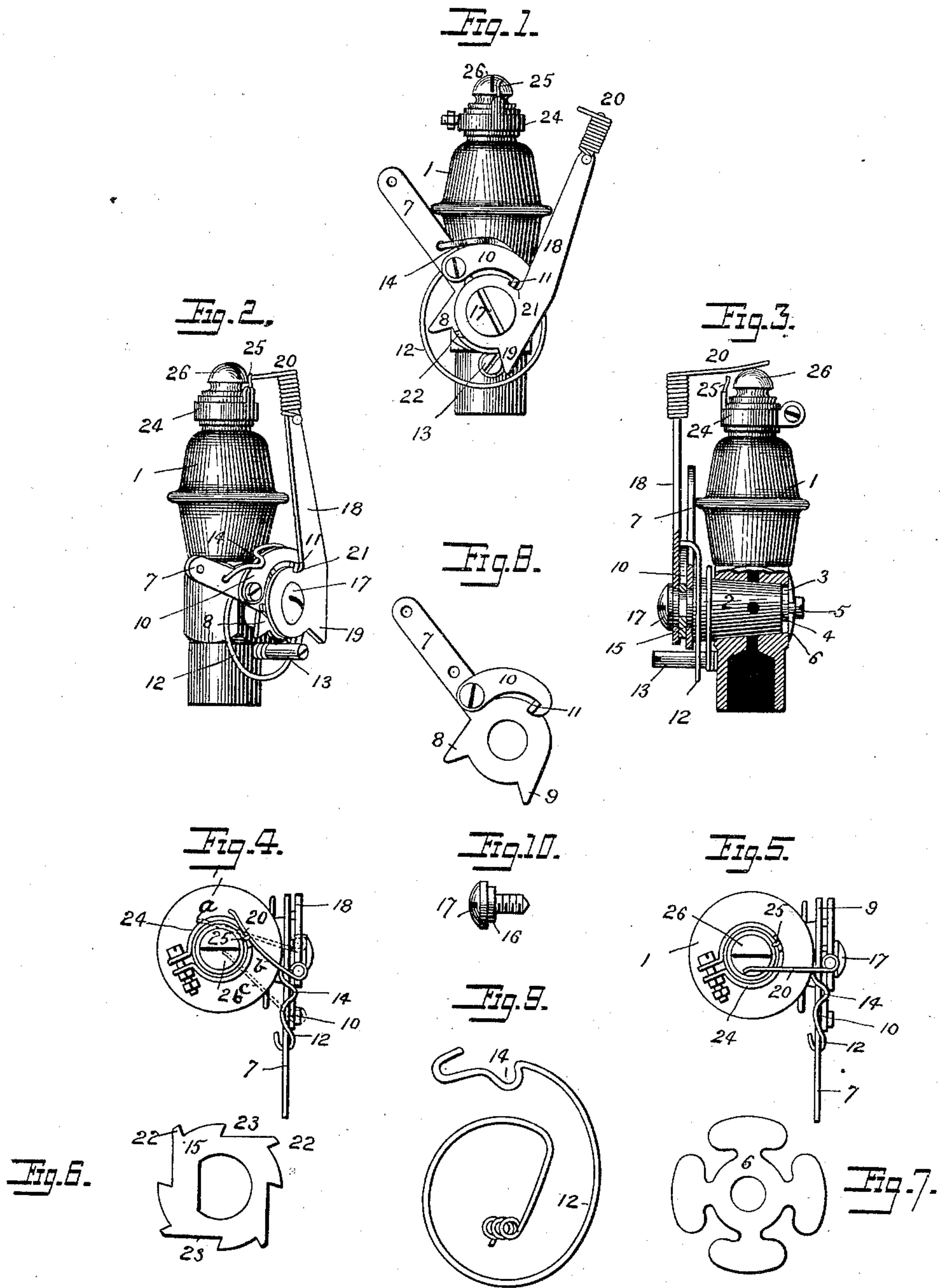


(No Model.)

J. H. LEHMAN.  
ELECTRIC GAS LIGHTER.

No. 432,884.

Patented July 22, 1890.



Witnesses  
*Wm. G. Hinkel*  
*W. S. McArthur*

Inventor  
*J. H. Lehman*  
By his Attorneys  
*Foster Freeman*



# UNITED STATES PATENT OFFICE.

JOSEPH H. LEHMAN, OF PHILADELPHIA, PENNSYLVANIA.

## ELECTRIC GAS-LIGHTER.

SPECIFICATION forming part of Letters Patent No. 432,884, dated July 22, 1890.

Application filed January 23, 1890. Serial No. 337,870. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH HUFTY LEHMAN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric Gas-Lighters, of which the following is a specification.

My invention relates to electric gas-lighting devices, and more particularly to that class wherein the gas-controlling cock is turned and contact making and breaking devices are operated to produce a spark at the burner-tip to ignite the gas by means of a lever having a pendant within reach of the operator.

My invention has for its object to produce a device whereby the spark apparatus will only operate when the cock is moved in such a manner as to permit the flow of the gas, and when the cock is moved for stopping the flow and extinguishing the flame the spark apparatus does not operate.

It further consists in such a device having the parts constructed and arranged so that the contact making and breaking devices will not be brought together except when the cock is moved forward to turn on the gas, and the retraction of the moving contact-carrying arm will not produce a contact between the electrodes.

My present invention consists in a construction and arrangement of parts substantially as hereinafter indicated, and is a practical improvement upon the subject-matter of my prior patent, No. 392,440, dated November 6, 1888.

Referring to the accompanying drawings, Figure 1 is a side view of a device embodying my invention. Fig. 2 is a perspective view showing the parts in position with the electrodes in contact. Fig. 3 is a rear view showing the position of the parts as the moving electrode passes the stationary electrode to assume its normal position. Figs. 4 and 5 are plans showing more definitely the motions of the moving electrode in its forward and backward movement; and Figs. 6, 7, 8, 9, and 10 are details of the parts.

In the burner described in my former patent above referred to means were provided whereby the moving electrode was operated only when the cock was turned to open the

passage for the flow of the gas, and thereby one-half of the usual battery-power was saved; but no means were provided whereby the return of the moving electrode to its normal position could be accomplished without making contact between the moving and stationary electrodes.

My present invention, among other things, contemplates providing an apparatus in which not only will the moving electrode be operated at every alternate movement of the cock, and thereby save one-half of the battery-power, but also providing a means whereby the electrodes will make contact and thereby expend battery force only when the moving electrode is moved forward concurrent with the opening of the valve. It also contemplates improvements connected with the valve itself, as well as in the details of construction and simplification of the parts, whereby the results may be accomplished in an effectual manner and at the least expense.

In the accompanying drawings I have shown my present invention as applied to a gas-burner 1, in which there is a tapering cock 2, which regulates the flow of gas to the burner. One great difficulty in this class of burners is to maintain the cock in its socket in such a manner as to allow its turning freely when actuated by the operating devices to open and close the cock, but to remain stationary when the operating devices are returning to their normal positions, and at the same time to prevent leakage of gas, which is a well-known objection to this class of burners. To accomplish this in the best and simplest manner, I carefully fit the tapering cock 2 to its socket 3 in the body of the burner, and I provide the cock with an extension 4, cut away, as shown, and having an adjusting-screw 5, between which and the cut-away portion is mounted a spring-washer 6, preferably in the form shown in Fig. 7, the arms of which bear upon the sides of the body of the burner, as indicated. In this way by turning the screw 5 the pressure of the elastic washer may be adjusted so as to permit the cock to be readily turned when desired, but producing sufficient friction to keep it from turning back when the operating-arm is returned to its normal position to engage the next ratchet and at the same time to prevent any leakage of gas. Mounted



on the opposite end of this cock 2 and fitted to move loosely thereon is an arm or lever 7, which may be provided with a pendant or operating device, and which is formed substantially as shown in Fig. 8, having projections 8 and 9 to limit its movement. Pivoted to this arm is a pawl-carrier 10, having a pawl or projection 11, extending laterally therefrom, for a purpose hereinafter set forth. This arm 7 is normally under the stress of a spring 12, one end of which may be secured to a stud or pin 13, and the other end is attached to the arm through an opening therein, or otherwise, as preferred. This spring is also provided with a re-entrant bend 14, which is adapted to rest over the pawl-arm 10 and normally hold it in position, and it will be seen that the single spring performs the function not only of retracting the arm 7, but also of controlling the pawl-arm 10; also mounted upon the end of the cock, which is cut away at one side, is a ratchet-wheel 15, with which the pawl 11 engages to turn the cock step by step; also mounted on the head of the cock and loosely turning thereon, and preferably supported upon the offset 16 of the screw 17, is a movable electrode-carrying arm 18, which is provided with an extension 19, acting as a stop to limit its movements in one direction and carrying at its free end the movable electrode 20, preferably in the form of a spring having an extended wiping end, as is usual in this class of devices. This movable electrode-carrying arm is formed at its lower end, embracing the offset of a screw, substantially in the form of a circle throughout the greater portion of its circumference, and at or near the point where this circle joins the arm I provide a notch 21, into which the pawl 11 drops under the pressure of the spring under certain conditions and operates to move the electrode-carrying arm when the cock is turned to allow the flow of the gas.

As in my previous patent above referred to, the ratchet-wheel 15 is provided with alternate long and short recesses adjacent to the teeth, which permit the ratchet-wheel to become engaged or not with the notch 21, according to the relative position of the ratchet-wheel with respect to the recesses. Thus when the pawl 11 engages with the projections 22 the notch adjacent said projections is not of sufficient depth to allow the pawl 11 to engage with the notch 21 of the movable electrode-carrying arm, and the cock is turned without moving said arm; but when the ratchet engages the projection or tooth 23 the recess is of sufficient depth to allow the pawl 11 to drop into the notch 21 and move the electrode-carrying arm with it, and this occurs when the cock is turned to permit the flow of the gas. The electrode-carrying arm is returned to its normal position by the pawl 11 bearing against the face of the arm when it is retracted by the spring 12.

Mounted upon the burner-tip by any suitable means, as by the collar 24, is the stationary electrode 25, and this is preferably in the

form of a bent or hooked extension, and is arranged adjacent the gas-orifice 26 of the burner-tip, but does not extend above the plane of its upper surface. When the movable electrode-carrying arm is moved forward as the cock is opened, the wiping-electrode 20 impinges upon the edge of the lava tip or burner on a line to the level with the end of the stationary electrode 25 and immediately contacts therewith, as shown in dotted lines *a*, Fig. 4. As the arm moves on, the wiping-electrode tilts or swings around the stationary electrode, as shown in full lines *b*, Fig. 4, making rubbing contact therewith. When the cock is fully opened to permit the flow of gas, the end of the wiping-electrode slips by the stationary electrode, and by its elasticity flies over the burner-tip in a direction indicated by dotted lines *c*, Fig. 4, and it will thus be seen that the spark created by the breaking of the two contacts is practically carried up over the gas-opening in the tips to insure the ignition of the gas. When, however, the electrode-carrying arm is released, the wiping-electrode impinges upon the face of the tip on the opposite side, as clearly shown in Fig. 5, and riding up over the tip, as shown in Fig. 3, passes over and free from the stationary electrode 25 without making contact therewith. This operation is aided by making the electrode-carrying arm project from its body mounted on the screw at practically a tangent to the circumference of its body, as clearly seen in Fig. 1.

It will thus be seen that by this arrangement only one contact between the fixed and movable electrodes is produced at each turning on and off of the gas, and thereby only one-fourth of the battery-power usually expended in this class of burners is utilized, and the waste produced by the unnecessary contacts and sparks is prevented. It will further be seen that in this construction I have simplified the operating parts of the burner by doing away with the shield or other equivalent device necessary in the construction shown in my former patent to prevent the pawl engaging with the movable electrode-carrying arm at each alternate reciprocation, and this is accomplished by making the body of the electrode-carrying arm practically in the shape of a circle, as before stated, whereby it performs the function of the shield in the before-mentioned patent and saves a complication of the parts.

While I have thus illustrated and described my invention embodied in a form which I have found to be the most practicable, it is evident that it may be carried out in other ways without varying from my invention, and I therefore do not limit myself to the precise construction described.

What I claim is—

1. In an electric gas-lighter, a movable electrode, in combination with another electrode, with which it makes contact to produce a spark at the burner-tip, mechanism for oper-



ating said movable electrode to make contact in its forward movement, mechanism for preventing such contact on its backward movement, and devices to prevent its movement at each alternate operation, substantially as described.

2. In an electric gas-lighter, a movable electrode, in combination with another electrode, with which it makes contact to create a spark at the burner-tip, a cock for regulating the flow of the gas, means for operating the cock and the movable electrode to make contact in its forward movement, and devices for preventing the movement and contact of the electrodes at each alternate movement of the cock, substantially as described.

3. In an electric gas-lighter, the combination, with the cock, of a lever loosely mounted thereon, a ratchet-wheel having alternately deep and shallow recesses rigidly connected to the cock, an electrode-carrying arm provided with a notch, and a pawl for operating the ratchet-wheel and arm, substantially as described.

4. In an electric gas-burner, the combination, with a lever loosely mounted on the cock, of a ratchet-wheel having alternately deep and shallow recesses rigidly connected to the cock, an electrode-carrying arm having a prac-

tically-cylindrical body and a notch, and a pawl mounted on the lever and adapted to engage the electrode-carrying arm at each alternate reciprocation, substantially as described.

5. In an electric gas-lighter, the combination, with a lever, a ratchet-wheel, an electrode-carrying arm, and a pawl, of a spring connected to the lever and having a re-entrant portion engaging the pawl, substantially as described.

6. In an electric gas-lighter, the combination, with the cock, of a ratchet-wheel connected to the cock, an electrode-carrying arm mounted on the cock, a lever connected to move the cock and the arm, and a washer for the cock having spring-arms bearing on the body of the burner and adjusted so as to prevent the cock turning back when the cock-operating devices and electrode-carrier are returned to their normal positions, substantially as described.

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

JOSEPH H. LEHMAN.

Witnesses:

F. L. FREEMAN,  
J. S. BARKER.