C. D. P. GIBSON.
Gas Lighting.

No. 202,018. Patented April 2, 1878.

Fig. 1.

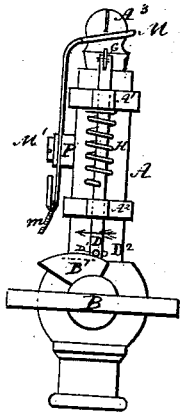


Fig. 2

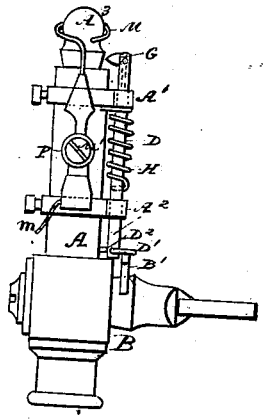


Fig. 4.

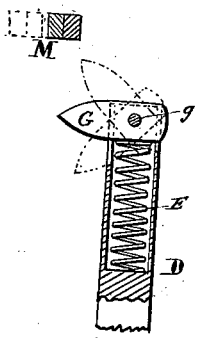


Fig. 3.

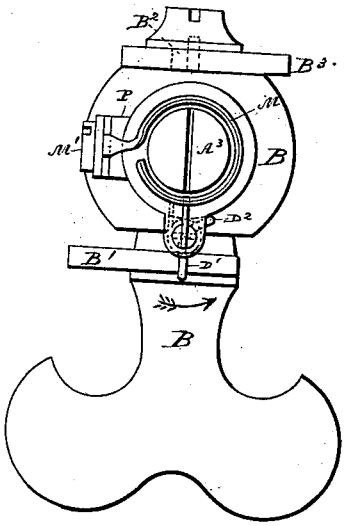
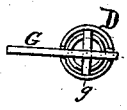


Fig. 5.



Witnesses :-
A. H. Gentner
H. A. Johnstone

Inventor :-
C. D. P. Gibson
by his attorney
T. S. Sutton
New York

UNITED STATES PATENT OFFICE.

CHARLES D. P. GIBSON, OF NEW YORK, N. Y.

IMPROVEMENT IN GAS-LIGHTING.

Specification forming part of Letters Patent No. **202,018**, dated April 2, 1878; application filed February 13, 1878.

To all whom it may concern:

Be it known that I, CHARLES D. P. GIBSON, of New York city, in the State of New York, have invented certain new and useful Improvements relating to Gas-Lighting, of which the following is a specification:

My invention is of that class in which a spark is induced by making and breaking electrical contact in the current of gas, and in which the motion to operate is derived from the turning of the cock.

One set of my apparatus may be applied for each burner, or, in case of lighting large buildings, and the like, one lighter thus operated may ignite, by the meeting of the streams, a large number of burners, as will be obvious.

I have devised and successfully wrought out a combination of parts which presents a neat appearance, and is so effectually self-contained and compact that it may be vigorously dusted with a strong feather-duster without danger of derangement.

My device insures the production of two sparks at each operation, and the contact is made by a frictional motion, which insures a clean and bright condition of the metal, so that the spark is unusually reliable.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention as applied to a single burner.

Figure 1 is an elevation in the line of the cock. Fig. 2 is an elevation at right angles thereto. Fig. 3 is a plan view on a larger scale. Figs. 4 and 5 show detailed views, on a still larger scale, of part of the rod D.

Similar letters of reference indicate like parts in all the figures.

A is the gas-pipe in connection with the positive pole of a battery. (Not represented.) B is the cock, having the ordinary provisions for tightening, &c., and having also a cam or wiper, B^1, the use of which will presently appear. A^1 A^2 are guides or eyes, which may be formed, as shown, in rings secured by pinching-screws, but which may ordinarily be formed as permanently-attached parts. A^3 is a tip of lava or other non-conductor, having a proper orifice for the delivery of a bat-wing jet, one edge of which is presented toward the rod D, which stands in the eyes A^1 A^2, and is capable of vertical motion therein. M is a ring, or nearly complete ring, which loosely incloses the lava tip A^3. Its support M′ is mounted on rubber or other insulating material, P, below, and is connected by a wire, *m*, with the negative pole of a battery. (Not represented.) The ring M is preferably supported in a recess or slight groove around the lava tip; but it should be allowed to project enough outside to form a prominent object on the side of the device. There should be room for it to contract considerably, as will be explained below.

What I have termed the "rod D" performs important functions. Its upper end is hollow or tubular, and incloses a spring, E, which presses upward with constant force against the under side of a hinged beak, G, which is pivoted at the point *g*, and is adapted to make and break connection with the ring M at each movement past it. H is a spring of hard brass wire coiled around the rod D, and engaging in a hole therein. It finds an abutment against the upper eye A^2, and exerts a constant force to depress the rod D. Its upper end is extended and bears against the body of the tip, and the spring being partially uncoiled, after its formation, it exerts a constant effort to coil itself farther, and thus to turn the rod D around in the direction indicated by the arrow in Fig. 3.

A pin or arm, D^2, projecting from the rod D near the base, meets the side of the burner A, and prevents the rod D from turning beyond a certain amount in the direction in which it is urged by the spring H.

Another arm, D^1, extends outward from the rod D near the base, and is in position to be acted on by the wiper B^1.

When the cock B is turned in the direction to open the passage and let on the gas, the wiper B^1 acts under the pin D^1 and elevates it, and with it the rod D and the flexible beak G. As soon as the gas is let on with full force the wiper B^1 passes the pin D^1, and allows it and its connections to drop, by the force of the spring H, to its first position. The two movements up and down of the rod D induce two sparks by making and breaking connection twice with the ring M—that is to say, on the

elevation of the rod D and its connections by the action of the wiper B^1, the beak G is first brought into contact with the ring M, and thereby deflected downward in opposition to the tension of the delicate spring E concealed within the rod D. The upward motion being continued, the contact of the beak G with the ring M is broken and a strong spark is produced. This is followed by the dropping of the rod D and its connections, during which dropping motion the beak G comes again in contact with the ring M, and is deflected upward thereby, and, on passing the ring M, induces another strong spark on its breaking contact during its downward motion. These sparks being both produced in or immediately below the current of gas, the gases ignite with certainty. The spark on the upward motion is most favorable for igniting the gas, because it is produced on the upper side of the ring M.

After the gas has been thus let on and ignited, any turning backward of the cock B to entirely or partially shut off the gas brings the vertical side of the wiper B^1 against the pin D^1 in such a manner as not to lift the rod D, but only to turn it horizontally around in opposition to the turning tension of the spring H. The spring H is adapted to yield readily to this force, and to allow the rod D and its connections to thus turn.

I make the nearly-complete ring M of two metals. The outside is brass, the inside iron. Brass has a greater expansion with a given degree of heat than iron. The compound partial ring is so formed that when cold it will stand off a little from the tip. Thus conditioned, it will stand directly in the path of the point of the beak G, and will be certain to be touched by the latter in its rising motion, and induce the spark; but so soon as the gas is ignited, and the heat therefrom has sufficiently raised the temperature of the nearly complete ring M, the expansion of the brass causes the partial ring M to contract and hug more tightly to the lava tip A^3. This motion tends to bring it out of the path of the beak G. It follows that if, by any possible derangement or mismanagement, the slide D and its connections are left in their highest position in or near the base of the flame, the battery will not be short-circuited, because the beak G will not remain in contact with the ring M. The latter will be drawn inward by the expansion of the metals of which it is composed so far as to be out of contact with the beak. The friction induced by the rubbing contact of the beak G with the partial ring M keeps the metal bright and insures an efficient spark with a moderate battery-power.

Many modifications may be made. Thus the ring M may be made not a complete ring, but only a little more than a half-circle. It is only useful on the side where it is touched by the flexible beak G. But by completely or partially embracing the lava tip A^3, it is braced and supported in position. I esteem this a very important point in practice. It overcomes one of the great objections to this class of devices—their liability to get out of order by being slightly displaced or bent in dusting or otherwise cleaning them.

The stops B^2 B^3 may be omitted from the cock B, and the cock may be allowed to turn quite around; but I prefer all the parts, as here shown.

I claim as my invention—

1. The slide D with a beak or arm, G, in combination with the cock B, wiper B^1, and with suitable electrical connections to itself and to an insulated piece, M, so as to break and make connections by a direct rising and sinking motion, as herein specified.

2. The turning pivot *g*, in combination with the beak G, slide D, and spring E, adapted to allow the beak to yield in both directions in rubbing past the piece M, as specified.

3. In an electrical gas-lighter, the slide D and its arm D^1, capable of both sliding axially and turning on its axis, in combination with the cock B and wiper B^1, and with means for inducing a prompt return after the turning and axial motion, as specified.

4. In a gas-lighting apparatus, the electrode D, provided with the spring H, adapted to perform the double functions of returning the electrode D to its position after either a turning or an endwise motion, as herein specified.

In testimony whereof I have hereunto set my name in presence of two subscribing witnesses.

CHAS. D. P. GIBSON.

Witnesses:

G. W. REYNOLDS,

O. H. MAYNARD.