C. D. P. GIBSON.

GAS-LIGHTING APPARATUS.

No. 174,799. Patented March 14, 1876.

Fig: 1.

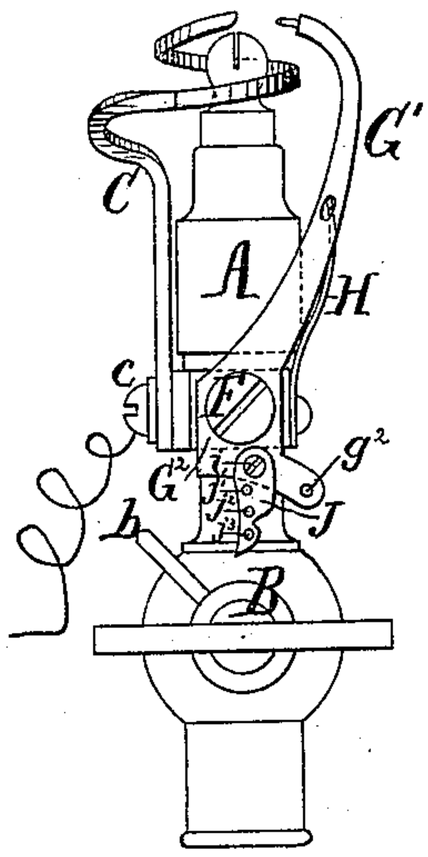


Fig: 3.

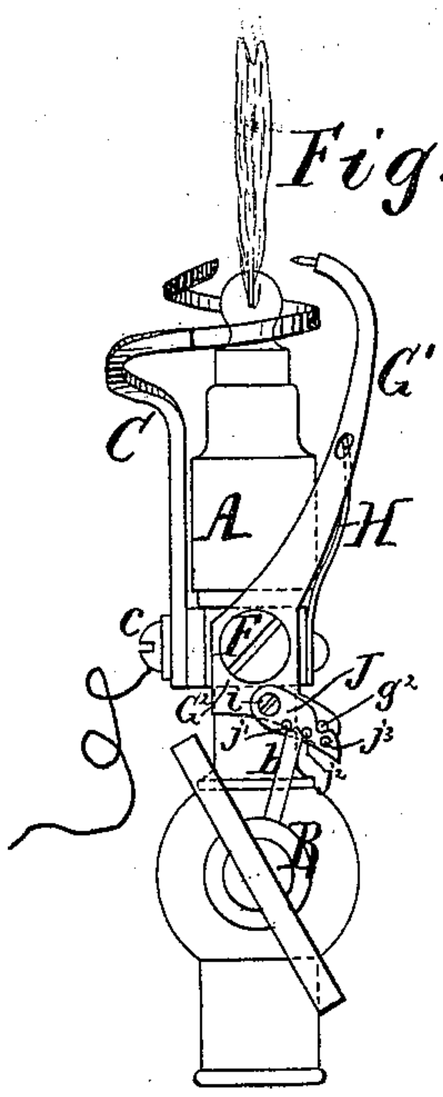


Fig: 2.

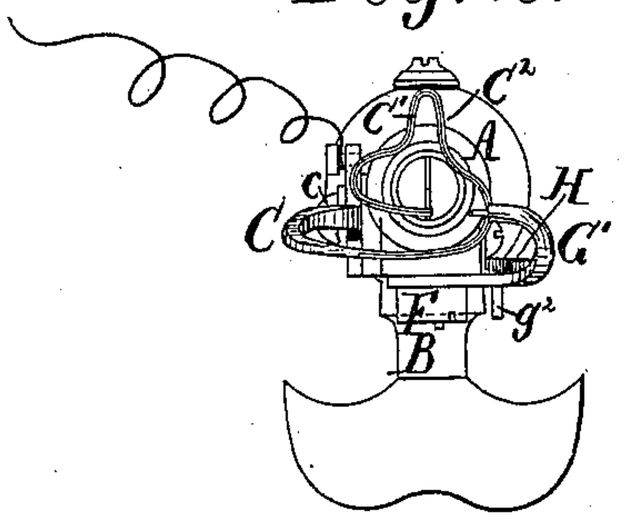
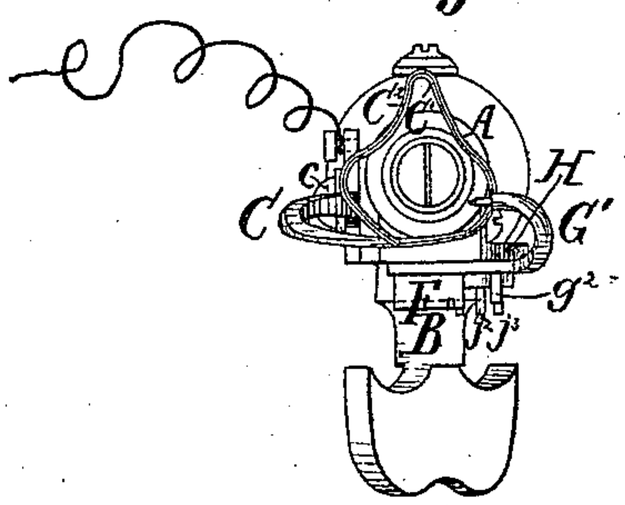


Fig: 4.



Witnesses:

W Henry Gentner

Jno L Dibble

Inventor:

Charles D. P. Gibson

by his attorney

Thomas D. Stetson

UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN GAS-LIGHTING APPARATUS.

Specification forming part of Letters Patent No. **174,799**, dated March 14, 1876; application filed February 26, 1876.

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 Improvements relating to Gas-Lighting Mechanism, of which the following is a specification:

The improvements apply to all that class of apparatus in which the gas is lighted by alternately making and breaking contact between conductors, and thereby inducing sparks. I have improved the details and gained several important advantages. The points of the conductors are liable to be left in contact when the gas is turned on, or partially turned on; and in such case a rapid destruction of the battery, and serious derangement of the apparatus results. The points are also liable to be injured by long-continued exposure to the full heat of the gas-flame. I form one or both of the conducting parts of compounded material, as iron and brass, which will expand unequally by heat, and so form and arrange the parts that one conducting-arm is drawn away from contact with the other conducting-arm, and also partially away from the burning jet, by its own action when heated. It follows that, when the gas is burning, the conducting parts, however they may be left by the mechanism, automatically assume positions out of contact with each other, and outside of the intensest heat, it being understood that either the stationary conductor, or the hinged one, or both, may be thus formed, if desired, so as to automatically withdraw itself from the intensest heat while the gas is burning. I will represent the invention as having this feature applied only to the stationary arm or conductor. It has long been practiced to cause the other or hinged arm to approach and recede from the stationary arm several times in succession in the act of turning on the gas, so as to obtain a succession of sparks, instead of a single spark. I obtain this effect by very simple means.

The accompanying drawing represents what I consider the best means for carrying out the invention.

Figure 1 is a side elevation, representing the parts in their ordinary condition, with the gas turned off. Fig. 2 is a plan view of the same. Fig. 3 is an elevation, representing the parts with the gas turned partly on. Fig. 4 is a plan view of the same.

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

I attach to the movable part a pendent arm, provided with a series of pins on its outer face, providing a stop on the movable part, to be struck by the pendent part when it is pressed in one direction, leaving it free to swing as far as may be required in the opposite direction without resistance. I fix on the stop-cock a finger having a double beveled end, which, in turning on the gas, presses the pendent part against the stop, and, in passing the several pins on the pendent part, compels a vibratory movement.

Referring to the drawings, A is the burner. B is the plug of the stop-cock, having a finger, *b*, formed with a double beveled end, as shown. C is the fixed conductor, held firmly between collars of gutta-percha, or the like, by means the screw *c*. The upper portion of the fixed arm C is bent, as shown, so as to nearly encircle the flame, and to stand in such position as to be very near but not exactly in it. The arm C is composed of two layers. The innermost layer C^1, next to the flame, is copper, or other material which is highly expansible by heat. The outermost layer C^2 is of steel, or analogous material, which is less expansible by heat. When the gas is lighted the heat from the flame warms both layers C^1 and C^2, but the superior expansibility of the innermost layer causes the compound conductor to partially straighten out. This straightening takes the end of this conductor out of the path of the other conductor, and also partially out of the gas-jet, as indicated in Fig. 4.

The movable arm is marked G^1 G^2, the upper portion G^1 being the longest, the whole turning easily on the screw-pin F, as will be understood. A spring, H, secured on the side of the burner, engages in a hole in the slot in the arm G^1, and tends to hold one end of this arm at a middle distance from the gas-jet. In the side of the lower arm G^2 is fixed a screw-pin, *i*, which carries a freely-pendent piece or pawl, J, having pins j^1 j^2 j^3 set in the side. The pin g^2 set in the arm G^2 serves as a stop to prevent the pawl J from swinging beyond it.

When the plug B, and consequently the fin-

ger *b*, is turned to the right in the act of turning on the gas, the double beveled end of the finger *b* strikes the first pin j^1, and, after swinging the pawl J to the right until it strikes the stop g^2, acts forcibly against the latter and turns the lever G^1 G^2 so as to bring the upper end of the lever G^1 into contact with the upper end of the compound fixed conductor C. The moment the beveled end of the finger *b* passes the first pin j^1, and is presented to the space between it and the second, the spring H draws away the arm G^1 out of contact with C, and induces a spark, and the movement of the finger *b* past the second pin j^2 induces a second approach of the conductors together, and a second separation, resulting in a second spark, and the same in passing the third. The length of the swinging pawl J may be increased, and the number of pins j^1 j^2 may be increased, but usually three will be sufficient. If the gas is turned full on and the finger *b* passes the last pin j^1, the pawl J will drop down by gravity and the lever G^1 G^2 will assume the position called for by the elasticity of the spring H, which should be set so as to hold one end of G^1 a little out of the flame. When the gas is turned off, the finger *b*, in moving to the left, swings the pawl J to the left without resistance, after which the pawl again drops and stands, as shown in the figures, ready to again serve when the gas is turned on. If, as sometimes will be the case, the gas is but partly turned on and is again turned off, the end of the finger *b* is formed with such bevel that it can be moved to the left past the one or more pins j^1 j^2.

It is important that the apex of the double bevel at the end of the finger *b* should have but a small bearing against the successive pins j^1 j^2, so as to reduce the liability that the parts will be left with the end of the finger presented centrally against one of the pins. In the rare case that the finger is left presented thus centrally, it will result that the end of the arm G^1 will be left in contact with the end of the compound arm C^1 C^2, and consequently in the flame. In such event the mutual expansion of the two metals in the compound arm C^1 C^2 will not only be of advantage by automatically withdrawing from the hottest part of the flame the said arm, but will also, by moving it laterally, take it out of contact with the arm G^1, and will prevent the battery from being idly worked.

It will be understood that the end of each of the conductors should, under all circumstances, be tipped with platinum. The ends may be quite small, if care is taken to confine the path of the movable arm G^1 so that it is certain to move in the proper plane, and, so long as the parts are cold, to make contact with the fixed arm when it is farthest inward.

Many modifications may be made in the details without detracting from the principle of the invention. Thus, the spring H may be coiled to increase its range of motion, and it may be adapted to induce the holding of the upper end of the lever farther from or nearer to the flame than is here represented. The pins j^1 j^2 may be formed in one with the piece J, and the stop-pin g^2 may be formed in one with the arm G^2; but I esteem it important that the parts corresponding to the pins j^1 j^2 j^3 be of hard steel, and, that the end of the finger *b* should be of the same material.

My improvement reduces the apparatus to what I esteem the smallest number of parts, the only moving parts, with the exception of the plug B, being the lever G^1 G^2 and the pawl J.

I claim as my invention—

1. In combination with a gas-burner, A, and suitable electrical conductors, the compound construction C^1 C^2 of one of the conductors, whereby it is, when the gas is lighted, automatically insured against a liability of contact with the other conductor, as herein set forth.

2. The pawl J j^1 j^2 and stop g^2, in combination with the finger *b* on the plug of the stop-cock, and with the burner A and suitable electrical conductors, as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand this 24th day of February, 1876, in the presence of two subscribing witnesses.

CHAS. D. P. GIBSON.

Witnesses:

JOS. FROHLICH,

G. W. SCHRAMM.