

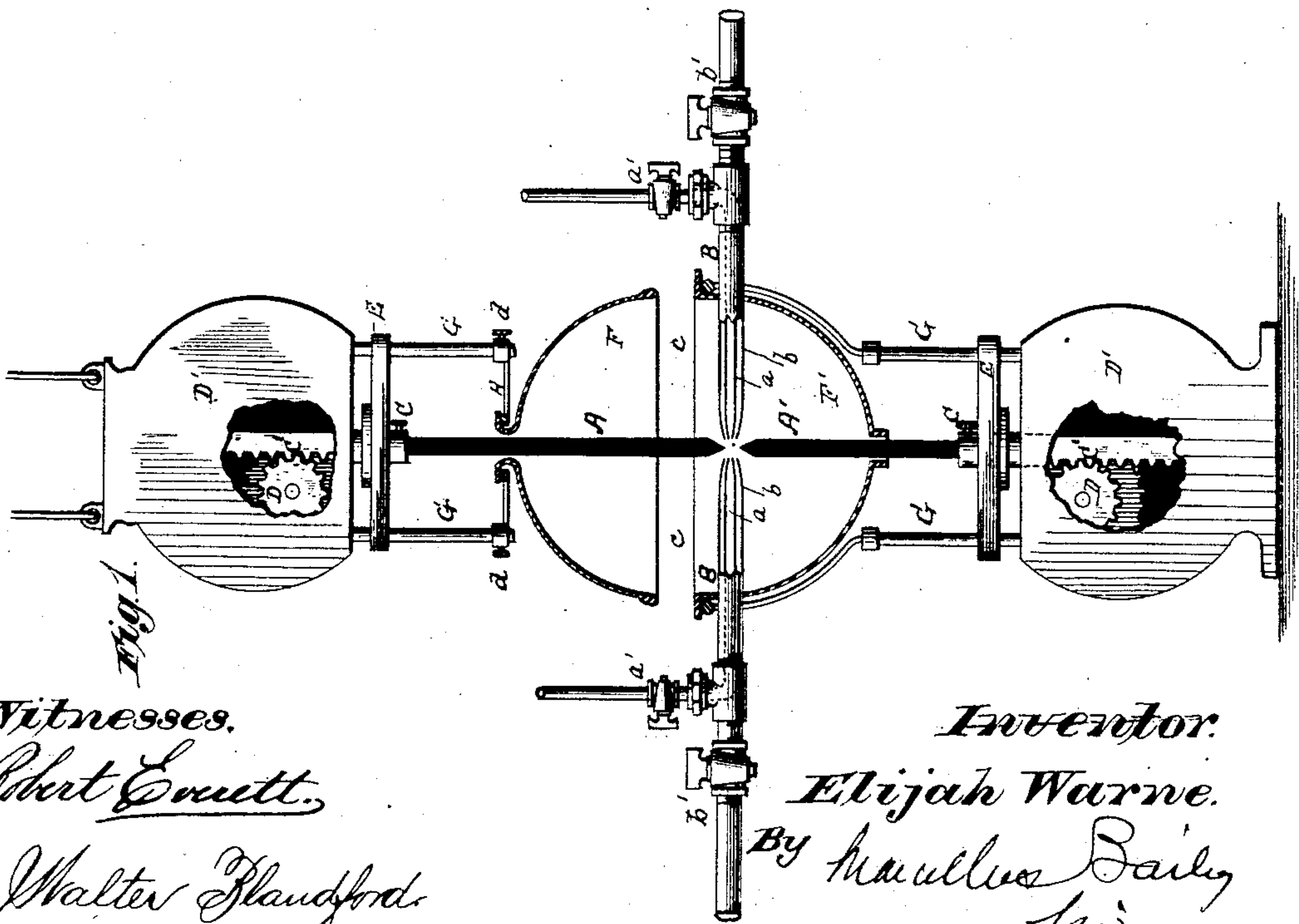
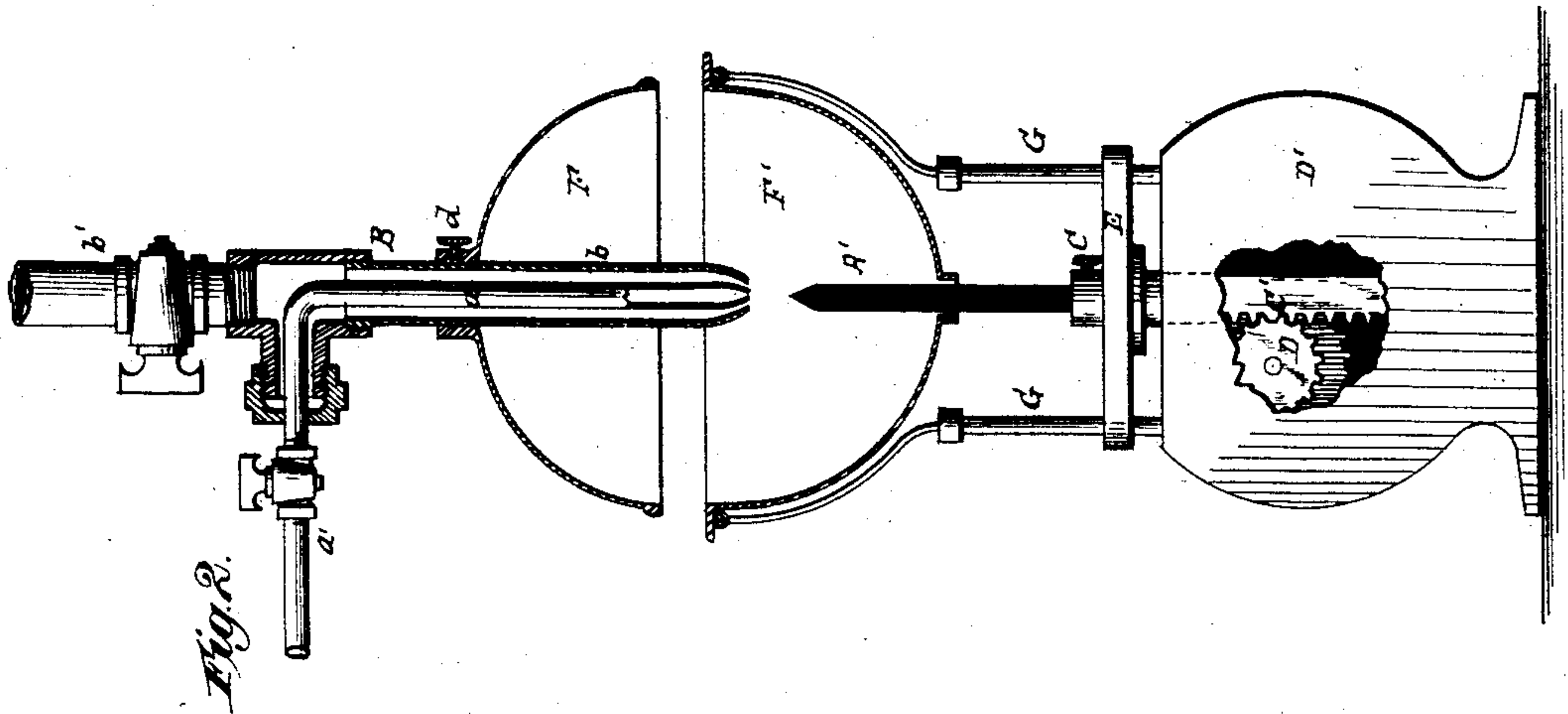
(No Model.)

E. WARNE.

ILLUMINATING APPARATUS.

No. 288,281.

Patented Nov. 13, 1883.



Witnesses.

*Robert Emmett.*

*Walter Glandford.*

Inventor.

*Elijah Warne.*

*By Marshall Bailey*  
*his atty.*

# UNITED STATES PATENT OFFICE.

ELIJAH WARNE, OF EASTON, PENNSYLVANIA.

## ILLUMINATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 288,281, dated November 13, 1883.

Application filed January 4, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, ELIJAH WARNE, of Easton, Northampton county, Pennsylvania, have invented certain new and useful Improvements in Illuminating Apparatus, of which the following is a specification.

My invention is directed to the production of light for illuminating purposes from carbon. I make use of carbon in the form of a pencil or stick, which is acted on at the end by a jet or jets of a hydrocarbon gas or hydrogen gas and oxygen or air, both of these agents being under pressure. The gases, preliminarily heated or not, as desired, are discharged at a point in the immediate vicinity of the end of the carbon, and are lighted. The heat thus produced at this point acts on the carbon and raises it to an intense heat, with the result of producing incandescence and gradual consumption of the carbon, and a consequent brilliant light. The carbon by a feed—such as a clock-work feed—is fed along in proportion to its consumption, so that its end where the light is obtained will maintain substantially the same position continuously with respect to the air or gas jet or jets.

The nature of my improvement can best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is a front elevation, partly in section, of an apparatus embodying my improvements in their preferred form. Fig. 2 is a like sectional elevation of a modified form of apparatus, in which only one carbon pencil is employed instead of two, as represented in Fig. 1.

In Fig. 1 there are two carbon sticks or pencils, A A', which are made in substantially the same way as carbons used in electric lamps of the arc type; and they are arranged in line one above the other, with their contiguous ends separated from one another by a short interval, very much as the carbons of arc-lights are arranged. At right angles with them are placed in line two compound jets, B B, whose nozzles or discharge ends approach one another in such manner that they and the carbon ends include between them a space bounded above and below by the carbons and on the sides by the jets. Each jet is composed of a central pipe, a, for supplying

hydrocarbon or hydrogen gas under pressure, and a surrounding pipe, b, for supplying air or oxygen under pressure. Pipe a communicates with its source of gas-supply through a cock-valve-controlled pipe, a', and pipe b communicates with its source of supply through the valve or cock-controlled pipe b'. Each jet thus discharges under pressure a central jet of hydrocarbon or hydrogen gas and an annular surrounding jet of air or oxygen.

When the apparatus is started, the gas and air are turned on and the issuing jets are lighted. By this means the carbon points or ends are heated, become incandescent, and gradually consume, the carbon particles given off mingling with the gases, and the combustion thus effected resulting in a brilliant light. After the lamp or apparatus is once fully started the proportions of gases delivered can be varied, the hydrogen or hydrocarbon gas can be gradually shut off, either wholly or to a great extent, leaving mainly the oxygen or air jet, which can be increased or varied, as desired.

Necessarily there is a gradual wasting away of the ends of the carbons, and they must therefore be fed forward in proportion to their consumption. To this end I mount each carbon in a holder, C, which, by a rack-bar, C', is in communication with a clock-work or train of wheels, D, inclosed in a suitable case, D', whereby the two carbons are fed toward one another gradually. The consumption of the upper carbon will be more rapid than that of the lower carbon, and consequently the upper feed mechanism must move proportionately faster than the lower one, so as to maintain the carbon ends in what may be termed the "focus" of the lamp. Each holder is steadied in its movements by means of a cross-bar, E, with which it is connected, which cross-bar has at its ends eyes, through which pass guide-rods G, extending from the clock-work case D.

In order to measurably shut off the illuminating-points from the direct influence of the surrounding air, I surround them by a globe consisting of two hemispheres, F F', supported by the upper and lower guide-rods, G, respectively. The upper half, F, of the globe is suspended in an adjustable way, so that it



may be raised from or lowered toward the under half, F', with a view to increasing or decreasing the width of the annular air-passage c, which separates them. To this end 5 the upper half, F, is hung in a cross-bar, H, mounted on and adjustable up and down on the upper guide-rods, G, and held thereon in any desired position by means of the set-screws d.

10 In Fig. 2 the lettered parts indicate similarly lettered parts in Fig. 1. The difference between this device and that shown in Fig. 1 consists in the modified arrangement of the light-producing devices; but one carbon and 15 one compound jet are employed, and the jet is arranged above and in line with the carbon.

Having now described my improvements and the manner in which the same are or may be carried into effect, what I claim, and de- 20 sire to secure by Letters Patent, is—

1. The combination, with a compound jet for supplying air or oxygen and hydrogen or a hydrocarbon gas under pressure, of a carbon pencil or stick therefor, and power-driven 25 feed mechanism connected to said holder and

arranged and operating to gradually and continuously advance the same while the lamp is running, whereby the pencil, as it is consumed, is fed toward the jet, under the arrangement and for operation as hereinbefore set forth. 30

2. The combination of the upper and lower carbons, independent feed mechanisms for the same, and the two compound jets for supplying air and gas under pressure, these parts being arranged in relation to one another and 35 being adapted for joint operation substantially as hereinbefore shown and set forth.

3. The combination, with the carbon or carbons and compound jet or jets, of the divided globe having one of its parts adjustable 40 to and from the other, so as to vary the width of the annular space separating their contiguous edges, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set 45 my hand this 29th day of December, 1882.

ELIJAH WARNE.

Witnesses:

J. WALTER BLANDFORD,  
EWELL A. DICK.