(No Model.)

L. F. BETTS.

GAS LAMP.

No. 364,703. Patented June 14, 1887.

FIG. 1.

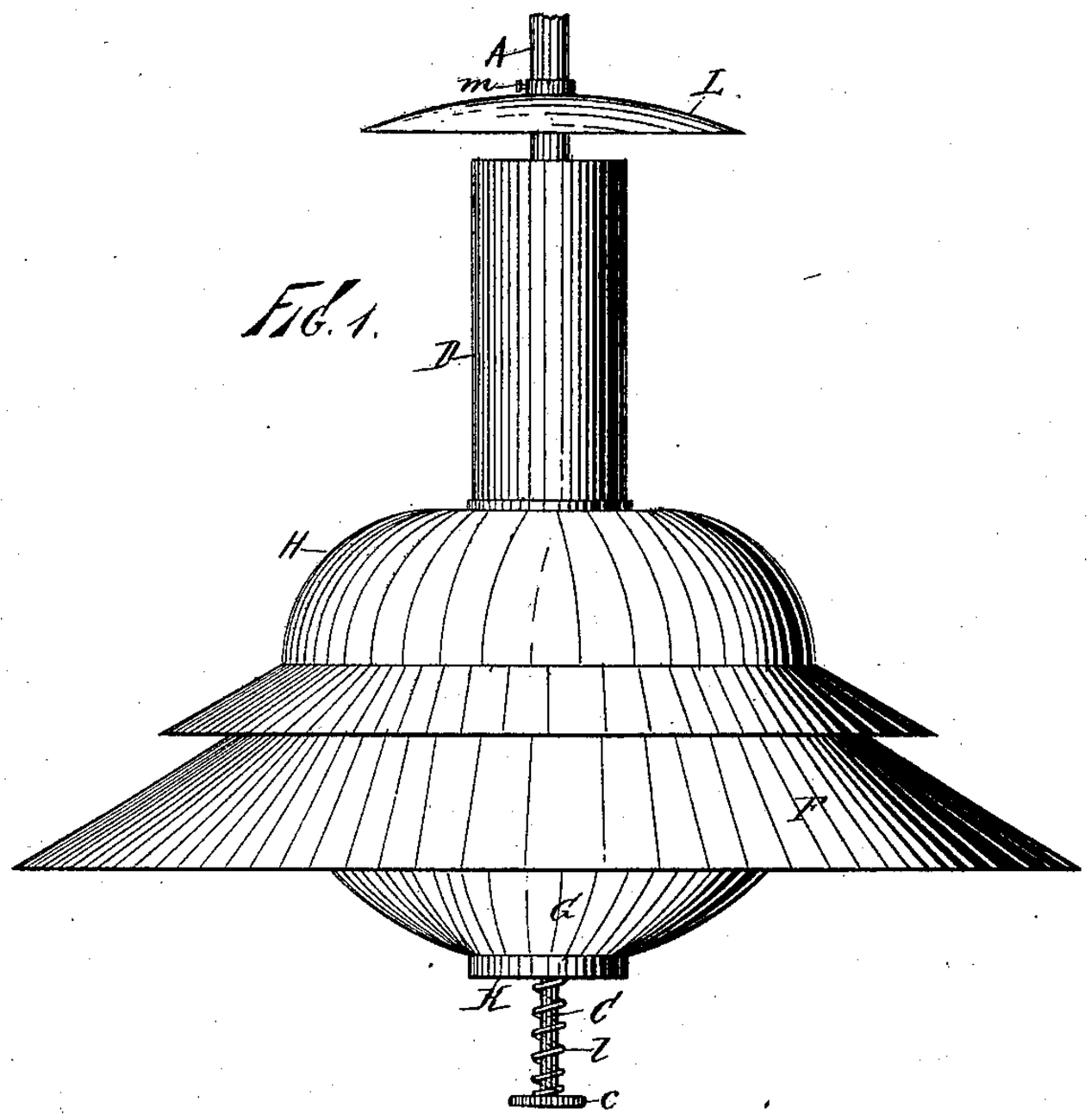


FIG. 3.

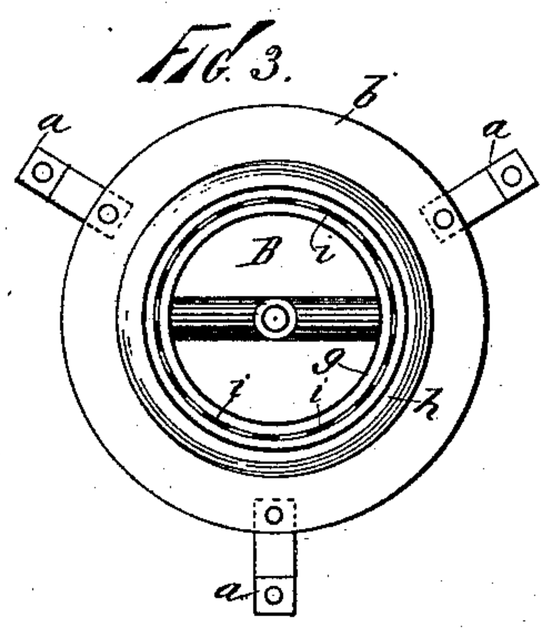
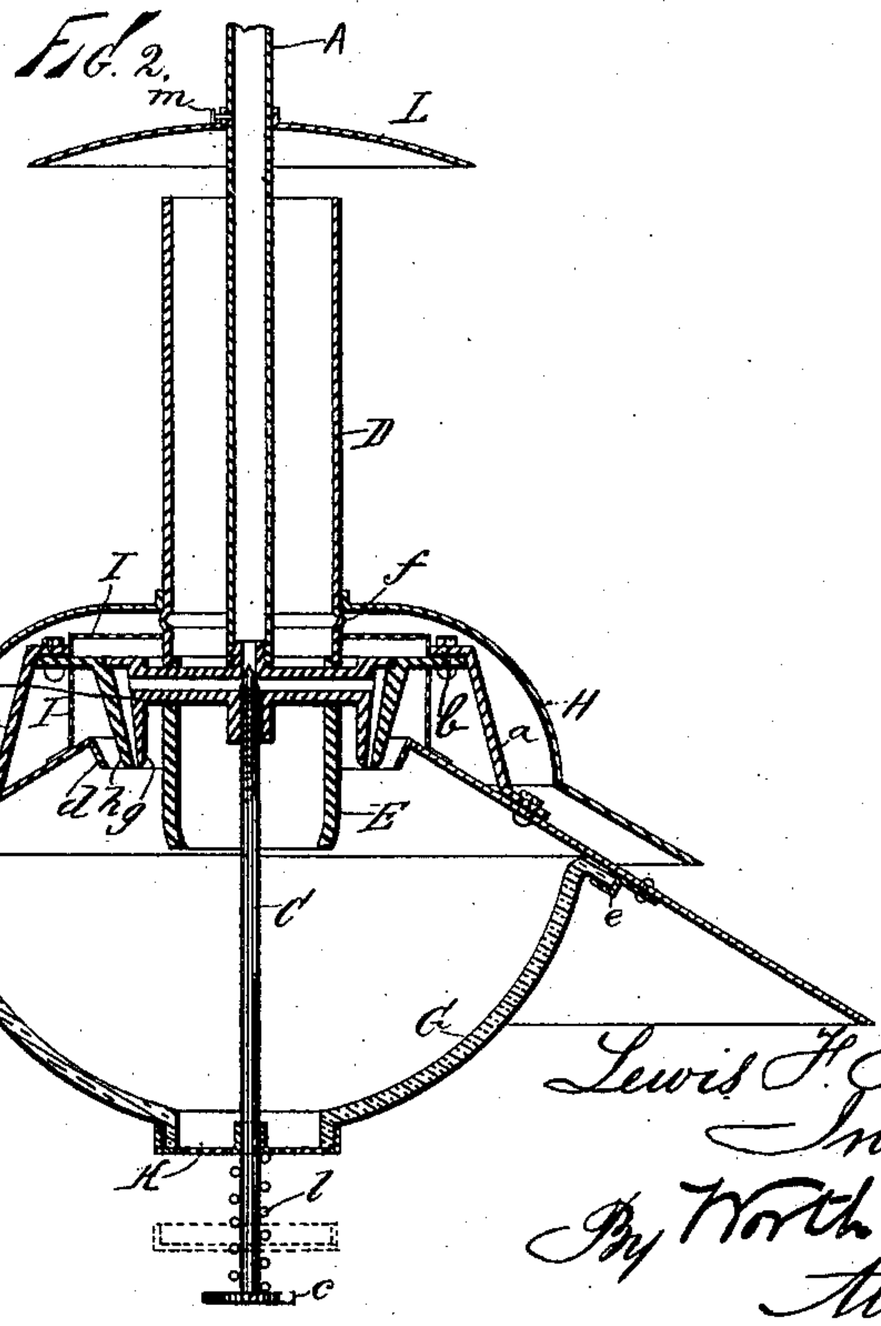


FIG. 2.



Witnesses:
John Buckler,
L. D. C. Osgood.

Lewis F. Betts,
Inventor:
By Wm. C. Osgood
Attorney.

UNITED STATES PATENT OFFICE.

LEWIS F. BETTS, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO THE R. E. DIETZ COMPANY, OF SAME PLACE.

GAS-LAMP.

SPECIFICATION forming part of Letters Patent No. 364,703, dated June 14, 1887.

Application filed December 13, 1886. Serial No. 221,354. (No model.)

To all whom it may concern:

Be it known that I, LEWIS F. BETTS, of New York city, county and State of New York, have invented certain new and useful Improvements in Gas-Lamps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention has relation to that class of apparatus wherein gas is burned for illuminating purposes and ordinarily known as "gas-lamps."

The object of my invention is to produce a gas-lamp which is simple, cheap, and durable in all its parts, wherein the illuminating effects are produced under an economical consumption of gas, wherein the air for support of combustion is brought to a high degree of heat before coming in contact with the flame, wherein the gas is heated before issuing from the burner, and wherein the parts are easily accessible, which lamp or apparatus may be employed for indoor or outdoor illumination, and embody other points of advantage, as will hereinafter appear. To accomplish all of this my improvements involve certain new and useful peculiarities of construction, relative arrangements or combinations of parts, and principles of operation, all of which will be herein first fully described, and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is an elevation, and Fig. 2 a central vertical section, of my improved device. Fig. 3 is a plan view of the burner disconnected from the other parts.

In all these figures like letters of reference, wherever they occur, indicate corresponding parts.

A is the gas supply pipe which conducts the gaseous fuel to the burner, and on which or by which the lamp or apparatus is sustained. This pipe, as will be readily understood, may depend from the ceiling of a room or may lead from any side or other source of supply, either indoors or outdoors, and may be joined with the source of supply in any desired manner.

B is a circular burner of Argand pattern, but in which the gas-jet orifices open downwardly. This burner is secured to the lower end of pipe A and sustains the main portions of the lamp, which are directly or indirectly connected therewith. The flow of gas to the burner is regulated or arrested by a screw-valve, C, of which the finger-piece *c* at the end is located at a point within easy reach and outside the globe.

D is the upper portion of the draft-chimney, which rests upon the burner, and E is the lower portion of said chimney, which is secured to the part D in any suitable way. The upper portion, D, may be made of any material—as metal—and enameled, if required, so that it will better withstand the effects of heat to which it is subjected when the lamp is in use. The lower portion, E, is preferably made of better heat-resisting material—as lava or any suitable compound—and it may be made somewhat thicker than the upper part, as shown, so that it will not be liable to split or crack. The diameter of the chimney is smaller than the diameter of the ring of gas-jet orifices, and the lower mouth of the chimney is located at a considerable distance below the plane of said orifices.

Upon the upper part of the burner is a flange or rim, *b*, upon which are mounted and secured two, three, or more connecting pieces, as *a a*, which sustain an opaque or other shade, F, in proper relation with respect to the burner. This flange or rim *b* also divides the feed-air into two currents—one to the interior and one to the exterior of the flame.

The shade F is of general conical form, and has a downwardly-projecting neck, *d*, which surrounds the burner but leaves an air-passage between it and the burner, the neck terminating about on a level with the gas-jet orifices, so that the incoming air may strike the flame near to the base of the latter.

G is a globe of transparent or translucent material, which is connected with the shade or reflector F by turn-buttons, as at *e e*, so that it may be easily detached at any time. The globe is of any suitable size and the shade or reflector is made to project beyond it, so that all the light from the burner may be reflected downwardly. Covering the burner and extending down for a short distance over the shade or reflector is an air-director, H, sustained at a distance above the reflector sufficient to admit all the

required air for the support of combustion. This shade is shown as mounted upon the chimney, its neck resting on a bead, as *f*, formed on the chimney; but any means of support might be adopted.

A perforated air distributer and regulator, as I I, is located beneath the director H, and so arranged that all the air which passes to the burner both inside and outside must first pass through the regulator, which insures a steady flame. The regulator is located near to the burner, so that it will not interfere with the inflow of air, and so that fluctuating currents cannot be generated in the air after it leaves the regulator.

The burner is of peculiar construction. The inner ring, *g*, is connected with the central cross-pipe, and the outer ring, *h*, is crowded to place over *g*, leaving a passage for gas between the two. The orifices of course may be formed in any suitable way; but in the burner shown these orifices are formed by crowding the two rings *g h* over a slitted or indented strip of thin sheet metal. (Represented at *i*, Fig. 3.) This mode of forming the orifices is preferred, because it makes them thin and uniform, giving a thin uniform flame, which is best adapted for use in this kind of a lamp. This construction of burner is made a part of a separate application (Serial No. 221,353, filed December 13, 1886,) for patent, and is therefore not claimed herein.

The parts of the lamp being assembled as above described, and the gas being ignited, the heat from the flame raises the temperature of the reflector or shade and the air-director to a high degree. Air for the support of combustion enters between these two elements, and is highly heated by contact therewith before it reaches the flame, and thus aids in the production of light from the fact that it does not sensibly cool the flame upon touching it. The heat thus utilized to elevate the temperature of the feed-air is only that which would otherwise be wasted, and therefore necessitates no extra consumption of gas. The channel through which the feed-air enters is inclined upwardly and offers little resistance to the ingoing currents. The whole current after passing the regulator is divided so that a portion passes outside the burner to the flame, and the other portion to the interior of the flame through the channel between the burner and chimney, being further heated by contact with the chimney. The flame under the influence of the chimney-draft is turned in toward the center of the chimney and up around the lower margin thereof. The lower mouth of the chimney depends far enough so that all the valuable parts of the flame may be utilized for illuminating purposes, and the inner current of air above referred to passes between the lower mouth of the chimney and the flame, thus preventing contact of the flame and chimney and thereby avoiding the deposition of soot and unnecessary damage to the lower mouth. The supply-pipe A, being located within the chimney, the contents thereof become highly heated, so the gas issues in a heated condition and is immediately surrounded by heated air, so that it may be utilized in an economical manner and without undue loss. The lower portion of the globe is protected by a perforated plate, K, which is made movable upon the stem C, being held to its seat by any suitable spring, as *l*. This admits a small quantity of air which passes directly to the chimney and prevents overheating of the globe and chimney; but the lamp will operate in the same way and with equal advantages if this plate were solid. Its main purpose is to afford access to the burner for lighting without dismounting the globe. The plate K can be pulled down with the hand, the gas ignited, and the plate released, when it will automatically assume its proper position. The globe may be easily dismounted for cleaning or for gaining access to the burner by turning the buttons *e* and allowing the globe to move down upon the stem C; or, if desired to detach the globe, the finger-piece *e* may be removed, or the stem C and globe removed together, after unscrewing the stem and turning the buttons *e*.

L is a smoke-bell independent of the lamp and secured at any height above the chimney and upon the pipe A, if desired, as by means of a simple set-screw, as *m*. This prevents the heat and products of combustion from contact with surrounding objects.

The improved lamp may be used in any situation, and is found to afford a brilliant, steady, and intense light, and generally to admirably answer all the purposes or objects of the invention, as previously set forth.

Having now fully described my invention, what I claim as new herein, and desire to secure by Letters Patent, is—

1. The combination, with the burner having the horizontal flange and shade supported upon the said flange, of the globe removably connected with said shade and the draft chimney, substantially as shown, and for the purposes set forth.

2. The combination, with the burner and central draft-chimney, of the shade, the globe, the valve-stem, the bottom piece, and the returning-spring, substantially as and for the purposes set forth.

3. In combination with the central pipe, the ring burner having the horizontal flange, the chimney projecting below the burner and leaving an air-passage between it and the burner, the shade attached to the flange and having the neck surrounding the burner, the air director, and the air distributer and regulator, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

LEWIS F. BETTS.

Witnesses:
JOHN BUCKLER,
WORTH OSGOOD.