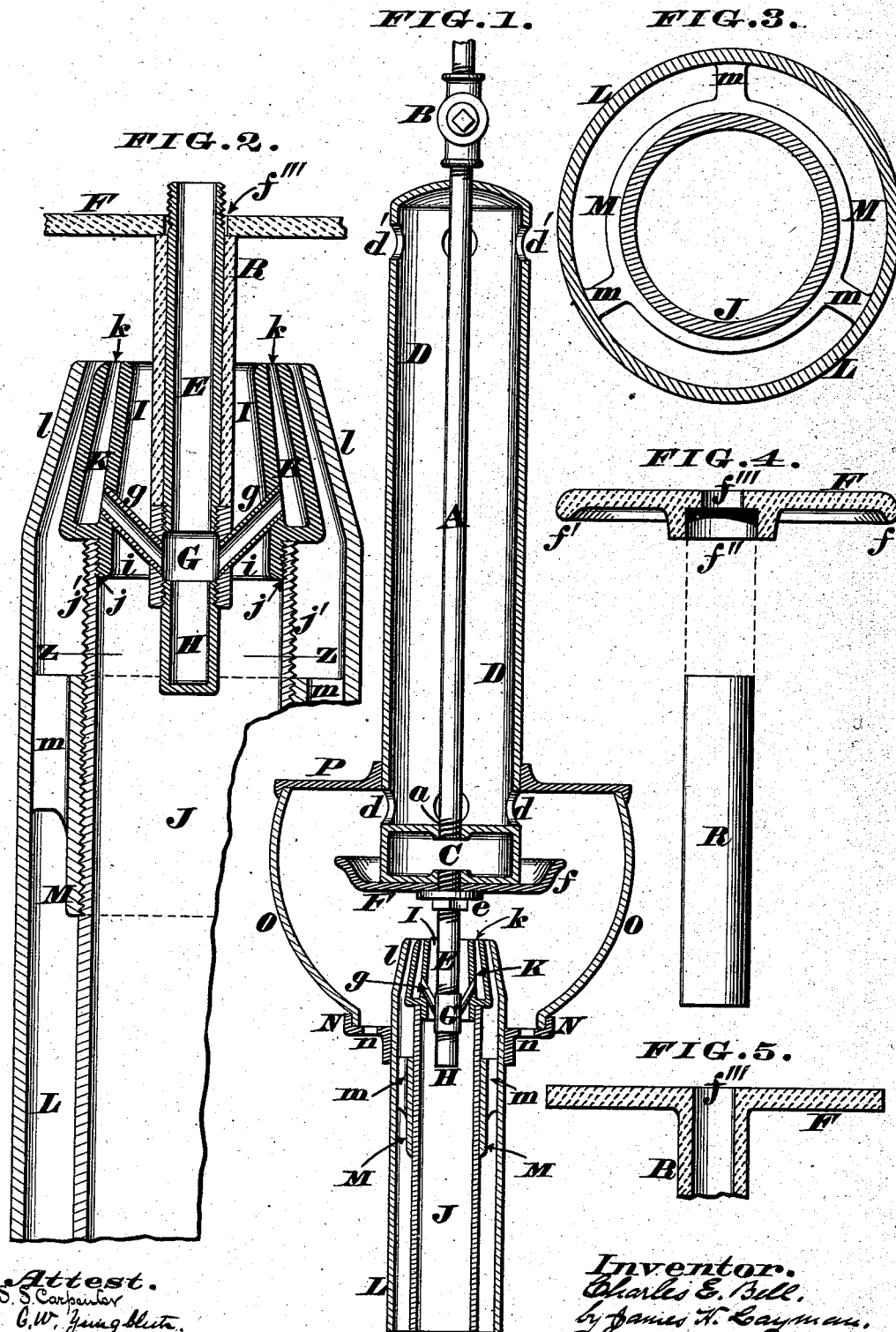


(No Model.)

C. E. BELL.
REGENERATIVE GAS LAMP.

No. 381,205.

Patented Apr. 17, 1888.



Attest.
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UNITED STATES PATENT OFFICE.

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REGENERATIVE GAS-LAMP.

SPECIFICATION forming part of Letters Patent No. 381,205, dated April 17, 1888.

Application filed October 1, 1887. Serial No. 251,185. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BELL, a citizen of the United States of America, residing at Greenfield, in the county of Highland and State of Ohio, have invented certain new and useful Improvements in Regenerative Gas-Lamps, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention comprises certain improvements in the peculiar form of regenerative gas-lamp seen in Letters Patent No. 367,949, granted to me August 9, 1887, the details of the present improvements being hereinafter more fully described, and then pointed out in the claim.

In the annexed drawings, Figure 1 is an axial section of a regenerative gas-lamp embodying my improvements. Fig. 2 is an enlarged axial section of the lamp-nozzle and its accessories. Fig. 3 is a horizontal section of the air-tubes, taken at the line *z z*. Figs. 4 and 5 are axial sections of two different modifications of the deflector or flame-spreader.

My lamp is suspended by the main gas-pipe A, having an external cock or valve, B, controlled in the usual manner, the lower end of said pipe being screw-threaded at *a* to engage with the gas-heating chamber C, which chamber is a continuation of the outer casing or jacket, D, that surrounds said pipe A. This chamber is separated from said jacket by a top plate, into which pipe A is screwed, and the jacket has a series of apertures, *d*, at bottom and similar openings, *d'*, at or near its upper end, for a purpose that will presently appear.

Screwed into the bottom of chamber C is the secondary gas-pipe, E, carrying a nut or collar, *e*, that maintains the flame spreader or deflector F in contact with said chamber. This deflector is made of any clay, earth, or other material or composition of materials capable of being brought into a plastic condition, and then molded to the desired shape before being baked or burned in the same manner as ordinary pottery or ceramic ware. Furthermore, care must be taken in the selection of materials to use only such clay or earth as will insure a very light-colored plate or disk, pure

white being preferred for obvious reasons. As seen in Fig. 1, the deflector is a disk with an upturned ogee rim, *f*; but in Fig. 4 the deflector has a downturned rim, *f'*, while in Fig. 5 the rim is dispensed with. Hence it follows that the construction of the flame spreader may be varied to suit circumstances. *f'''* is a central aperture in said disk to permit the passage of the gas-pipe E, as more clearly seen in Fig. 2.

The lower end of secondary gas-pipe E carries a coupling, G, to which a drip-cup, H, is screwed, the object of said cup being to collect any impurities or sediment that may fall down within said pipe.

g g represent a series of branch pipes proceeding laterally from the coupling G and sloping up to the nozzle I, which nozzle has a screw-threaded neck, *i*, that engages with an internal thread, *j*, at the top of the central air-tube, J. Nozzle I has an annular receiving-chamber, K, into which the gas is conducted before escaping at the jet-orifice *k*, which latter may be simply a very narrow annular slot, or it may consist of a series of small holes quite close together.

L is the outer air-tube, having a series of radial arms, *m*, united to a ring, M, which latter is a nut engaging with the external thread, *j'*, of the central air-tube, J. The upper end of tube L is contracted at *l*, for a purpose that will presently appear. Applied to this outer tube is a support, N, perforated at *n* and carrying the glass globe O, whose top is closed by a cap, P, attached to the casing D.

The operation of my improved lamp is as follows: Cock B is first opened to allow the gas or illuminating-vapor to flow through the main pipe A and fill the chamber C, from whence it escapes down the secondary pipe E into the branches *g g*. These branches conduct the gas to the receiving-chamber K, and as soon as the latter is filled the vapor escapes therefrom through the jet-orifices *k*, and is at once ignited by means of a light or otherwise. As soon as the gas begins to burn, a draft is created up the air-tubes J L, the current from the inner tube, J, escaping through the nozzle I, while the current from the outer tube, L, escapes through the contracted end *l* of the same. Consequently the two currents of air

minge with the flames at the orifice *k*, thereby producing a perfect combustion of the gas and affording a very clear and brilliant light, which is intensified by reflection from the white deflector *F*. This deflector spreads the flames and soon becomes very highly heated, which heat is transmitted directly to chamber *C*. Therefore the gas in this chamber is highly heated on its way to the secondary gas-pipe *E*, while the main gas-pipe *A* is heated by the vapors that pass through the openings *d* and traverse the casing *D*, the vapors finally escaping from said casing through the upper perforations, *d'*. While the lamp is thus operating the currents of air entering at the openings *n* of the support *N* keep the globe *O* sufficiently cool to prevent it cracking.

In the modification of my invention seen in Fig. 4 the under side of the deflector has a central circular socket, *f''*, to admit the upper end of a ceramic cylinder, *R*, adapted to surround the secondary gas-tube *E* and to rest upon the coupling *G* of the same, as represented in Fig. 2; but in this last illustration the socket is omitted, and the disk *F* rests directly upon the top of said cylinder *R*. Another change is seen in Fig. 5, wherein the cylinder is integral with the disk or deflector.

By thus enveloping the secondary gas-tube within a ceramic cylinder the exposed portion of the latter serves to reflect light from the lamp, it being understood that said cylinder is perfectly white, or as near that color as can be obtained. This ceramic cylinder and the ceramic deflector preserve their light color for an indefinite length of time, and never tarnish nor become black with soot and other deposits, as do the ordinary metallic deflectors used in lamps of this character.

I claim as my invention—

The combination, in a regenerative gas-lamp, of inner air-tube, *J*, screw-threaded at *j j'*, a screw-threaded nozzle, *I K k*, engaged with the thread *j*, a gas-tube, *E*, having branches *g*, connecting with said nozzle, and an outer air-tube, *L*, having a contracted upper end, *l*, and a series of arms, *m*, provided with a nut, *M*, that engages with the thread *j'* of said inner air-tube, as herein described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. BELL.

Witnesses:

P. K. DAVIS,

A. M. MACKEELEY.