

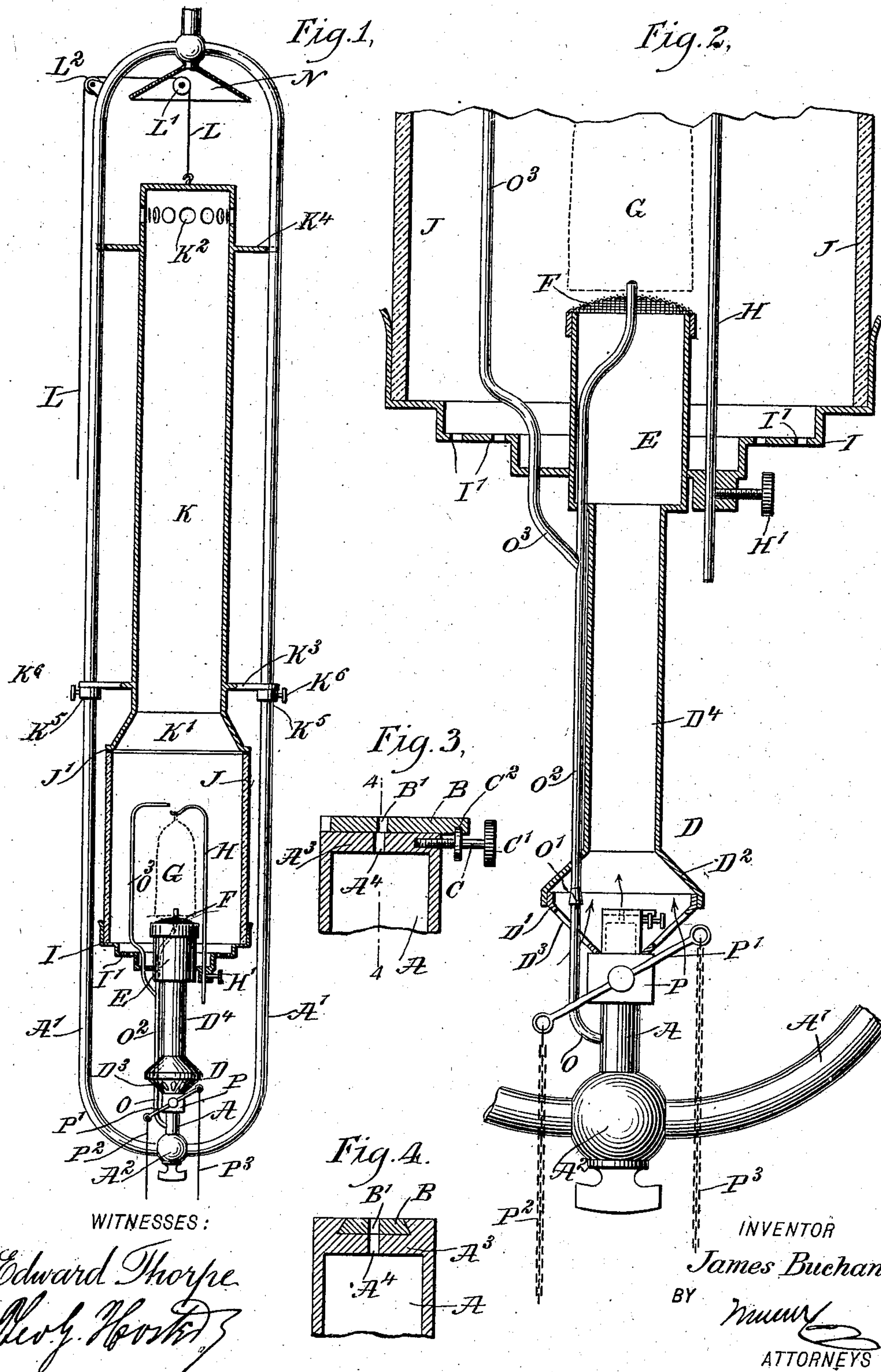
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Patented Sept. 9, 1902.

J. BUCHANAN.  
INCANDESCENT GAS BURNER.

(Application filed Jan. 9, 1902.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## INCANDESCENT GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 708,861, dated September 9, 1902.

Application filed January 9, 1902. Serial No. 88,992. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES BUCHANAN, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Incandescent Gas-Burner, of which the following is a full, clear, and exact description.

The invention relates to incandescent gas-burners in which a mantle is rendered incandescent by burning a mixture of gas and air within the mantle.

The object of the invention is to provide a new and improved incandescent gas-burner, more especially designed for street-lighting, lighting of halls, large rooms, and the like and arranged to insure an intimate mixture of gas and air and a very economical production of a powerful and brilliant light.

The invention consists of novel features and parts and combinations of the same, as will be described hereinafter and then pointed out in the appended claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is an enlarged sectional side elevation of part of the same. Fig. 3 is an enlarged sectional side elevation of the gas-admission valve, and Fig. 4 is a transverse section of the same on the line 4-4 in Fig. 3.

The gas-supply pipe A is connected with the service-pipe A', preferably made in the shape of an elongated loop, as is plainly shown in Fig. 1, and in said pipe A' is arranged a shut-off valve A<sup>2</sup> for shutting off the gas from the supply-pipe A whenever it is desired to do so. In the top A<sup>3</sup> of the supply-pipe A is formed a small outlet-opening A<sup>4</sup> in register with an opening B', formed in a slide-valve B, mounted to slide in a suitable bearing arranged in the top A<sup>3</sup>. (See Figs. 3 and 4.) In one side of the top A<sup>3</sup> screws a screw-rod C, having a knob C' and a collar C<sup>2</sup>, engaging a recess in the under side of the slide-valve B, so that when the operator turns the knob C' said collar C<sup>2</sup>

moves the slide-valve B inward or outward to bring the opening B' in more or less registration with the opening A<sup>4</sup>. Thus by the arrangement described the escape of gas from the supply-pipe A through the registering openings A<sup>4</sup> and B' can be regulated to a nicety. The gas passing through the opening B' mixes with air in the mixing-chamber D, preferably made of a lower section D' and an upper removable section D<sup>2</sup>, the sections being in the shape of frustums of a cone and the lower section D' being provided with air-inlet openings D<sup>3</sup>, so that air can readily pass into the chamber to mix with the gas issuing through the opening B'. From the upper section D<sup>2</sup> of the mixing-chamber extends integrally upward a conducting-tube D<sup>4</sup>, carrying at its upper end an enlarged chamber E, covered at the top by a convex screen F, so that the mixture of air and gas passing from the chamber E through the said-screen is minutely divided and mixed to properly burn in the mantle G, held above the screen F and sustained in a suitable supporting-rod H, adapted to be vertically adjusted and fastened by a set-screw H' in position in the chimney-carrier I, concentric with and secured to the chamber E. The chimney-carrier I supports the chimney J and is provided in its bottom with air-inlet openings I' to admit air to the inside of the chimney and to the mantle G, so as to insure high incandescence of the said mantle. The upper end of the chimney J connects with the flaring bottom K' of a tube K of suitable height and provided in its upper end with outlet-openings K<sup>2</sup> for the products of combustion, said tube K being provided with lugs K<sup>3</sup> and K<sup>4</sup>, mounted to slide on the side arms of the service-pipe A', as is plainly indicated in Fig. 1. The lower set of lugs K<sup>3</sup> is adapted to be seated on collars K<sup>5</sup>, held adjustably on the side arms of the supply-pipe A' and adapted to be fastened thereto by set-screws K<sup>6</sup>, so as to support the tube K in proper position relatively to the chimney J. A washer J' may be introduced between the upper edge of the chimney and the lower edge of the bottom K'. The top of the tube K is connected with one end of a rope or chain L,



extending over pulleys L' L<sup>2</sup> to then hang downward to be within convenient reach of the operator for lifting the tube K upward out of engagement with the washer J' and chimney J whenever it is desired to remove the chimney J for gaining access to the mantle G and the burner proper. A hood N is arranged above the tube K, so as to deflect the rising gases into the room.

10 A pilot-pipe O extends from the supply-pipe A' between the shut-off valve A<sup>2</sup> and the valve P, located below the regulating slide-valve B, as is plainly shown in the drawings, and said pilot-pipe O is engaged by a coupling O' on the lower end of the pipe O<sup>2</sup>, attached to the section D<sup>2</sup> and the chamber E, the upper end of said pipe O<sup>2</sup> extending through the chamber and the center of the screen F, so as to ignite the gaseous mixture  
20 passing through the screen F. The connection between the pipes O and O<sup>2</sup> is in about the same horizontal plane as the junction between the sections D' and D<sup>2</sup>, so that when said sections are separated the pipe O<sup>2</sup> goes  
25 with the section D<sup>2</sup>. By this arrangement convenient access can be had to the regulating slide-valve B and the parts can be readily connected again—that is, the section D<sup>2</sup> when fitted into the section D' brings the coupling  
30 O' into engagement with the pipe O. A branch pilot-pipe O<sup>3</sup> leads from the pipe O<sup>2</sup> and extends through the bottom of the chimney-carrier I to the top of the mantle G, so as to insure at all times proper ignition of the  
35 gaseous mixture in the mantle G both from the top and bottom thereof.

The valve P, previously mentioned, carries on its valve-stem the usual lever P', from the ends of which depend the operating-chains  
40 P<sup>2</sup> P<sup>3</sup>, adapted to be manipulated by the operator for opening and closing the valve P whenever it is desired to cut off the supply of gas to the slide-valve B. It is understood that when the valve P is closed the gas can  
45 still pass through the pilot-pipes O O<sup>2</sup> O<sup>3</sup> to the ends thereof, and the gas issuing from the pilot-pipes remains burning while the valve P is shut off, and when the valve P is again opened then the gaseous mixture is ignited  
50 by the burning gas from the pilot-pipes, both from the top and bottom of the mantle.

By the arrangement described the mixture of gas and air travels a considerable distance from the mixing-chamber D<sup>2</sup> to the screen F, so that a very intimate mixture of gas and  
55 air takes place, and consequently it requires but a small percentage of gas to insure perfect combustion of the mixture in the mantle G. A very powerful and brilliant light is  
60 obtained, so that the device is readily applicable for street-lighting purposes, as well as for lighting halls, large rooms, and the like. By means of the tube K a draft is created which brings the gas from the openings A<sup>4</sup>  
65 and B' with an additional pressure and also adds to the force of the current of mixed air and gas through the tube D<sup>4</sup>.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An incandescent gas-burner, comprising a gas-supply pipe, a mixing-chamber having an air-inlet and into which said supply-pipe opens, a slide-valve on the supply-pipe to regulate the amount of gas passing from the  
75 supply-pipe into the mixing-chamber, said slide-valve being mounted to slide in a bearing on the supply-pipe and having an aperture adapted to register with the outlet-opening in the supply-pipe and a recess in its under side, and a screw-rod screwing into said  
80 supply-pipe and having a collar engaging the recess in said slide-valve, as set forth.

2. An incandescent gas-burner having a valved gas-supply pipe, a mixing-chamber  
85 into which projects said supply-pipe, said mixing-chamber comprising an upper and lower section, the lower section being provided with air-inlets and the upper section separable from the lower section and formed with a  
90 conducting-tube projecting from its top, an enlarged chamber at the upper end of the conducting-tube, a screen over the top of said enlarged chamber, and a pilot-pipe made in  
95 separable parts, the lower part being attached to the supply-pipe and extending into the mixing-chamber and the upper part carried by the conducting-tube with its lower end  
100 projecting into the mixing-chamber and coupled with the lower part, the upper end extending into the enlarged chamber, as set forth.

3. An incandescent gas-burner having a valved gas-supply pipe, a mixing-chamber formed of separable parts in the shape of  
105 frustums of a cone and into which projects said supply-pipe, said mixing-chamber having its lower portion provided with air-inlets and its upper portion formed with a conducting-tube projecting from its upper end, an  
110 enlarged chamber at the upper end of the conducting-tube, a screen over the top of said enlarged chamber, and a pilot-pipe made in separable parts, and extending from the supply-pipe through the mixing-chamber up into  
115 the enlarged chamber and through said screen, as set forth.

4. An incandescent gas-burner having a mixing-chamber formed of separable sections in the form of frustums of a cone, the lower  
120 section being perforated and the upper section having a conducting-tube projecting from its top, an enlarged chamber at the upper end of the conducting-tube and provided with a screen at its upper end, a supply-pipe  
125 projecting into the mixing-chamber, a valve in the supply-pipe within the mixing-chamber, a valve in the supply-pipe below the chamber, and a pilot-pipe leading from the supply-pipe below the valve outside of the  
130 mixing-chamber and extending up through the said chamber along the outside of the conducting-tube and into the enlarged chamber and through the screen thereof, said pilot-



pipe being in sections coupled together in the mixing-chamber, as set forth.

5 An incandescent gas-burner, having a mixing-chamber formed of separable sections, the lower section being perforated and the upper one having a conducting-tube projecting from its top, an enlarged chamber at the upper end of the conducting-tube and provided with a screen at its upper end, a service-pipe 10 provided with a valve, a supply-pipe leading from the service-pipe and extending into the mixing-chamber and provided with a regulating-valve at its end within the said chamber and with a valve below the chamber, and 15 a pilot-pipe made in sections coupled together within the mixing-chamber, the lower section being connected with the supply-pipe below the valve therein that is outside of the mixing-chamber and the upper section extending 20 out through the mixing-chamber, along the outside of the conducting-tube and into the enlarged chamber and through the screen thereof, as set forth.

6. An incandescent gas-burner having a 25 valved gas-supply pipe, a mixing-chamber into which opens said supply-pipe, said mixing-chamber having its lower portion provided with air-inlets and its upper portion separable from the lower portion and formed 30 with a conducting-tube, an enlarged chamber at the upper end of the conducting-tube, a screen over the top of said enlarged chamber, a pilot-pipe made in separable parts, of which the lower part is attached to the supply-pipe

and the upper part to the conducting-tube 35 and the enlarged chamber, said pilot-pipe extending to the top of the screen, and a branch pilot-pipe extending from said pilot-pipe to the top of the mantle located above the screen, as set forth. 40

7. In an incandescent gas-burner, the combination with a burner proper, and a chimney therefor, of a guideway extending up above the top of the chimney, a tube having a flaring lower end adapted to rest upon the upper 45 end of the chimney, and with laterally-projecting lugs sliding on the guideway, and means connected with the upper end of the tube for raising the same, as set forth.

8. In an incandescent gas-burner, the combination with a burner proper, and a chimney 50 therefor, of a loop-shaped service-pipe extending above the chimney, of a tube of less diameter than the chimney and having a flaring lower end adapted to rest upon the upper 55 end of the chimney and provided with laterally-projecting lugs adapted to slide upon the looped service-pipe, and with outlet-openings in its upper end, and adjustable stops on the looped service-pipe with which a pair of the 60 lugs of the tube engage, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES BUCHANAN.

Witnesses:

THEO. G. HOSTER,  
EVERARD B. MARSHALL.