

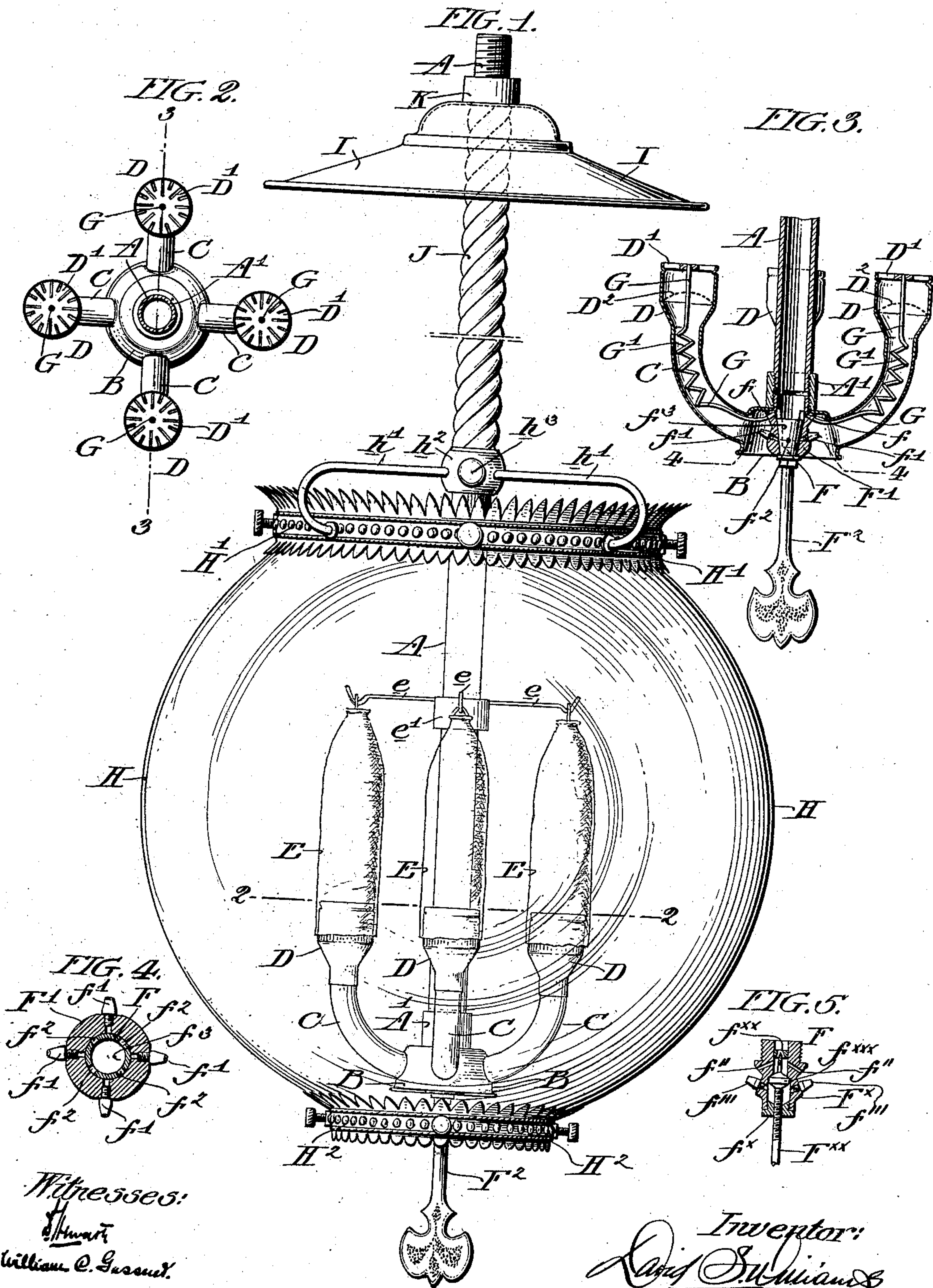
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D. S. WILLIAMS.  
GAS INCANDESCENT LAMP.

Patented Dec. 30, 1902.

(No Model.)

(Application filed Aug. 2, 1902.)



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# UNITED STATES PATENT OFFICE.

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## GAS INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 717,483, dated December 30, 1902.

Application filed August 2, 1902. Serial No. 118,050. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID S. WILLIAMS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Gas Incandescent Lamps, of which the following is a specification.

My invention relates to improvements in gas-lamps; and it consists of a device whereby a small jet or pilot may be kept constantly burning and shielded by the mantles which cover the burner-heads, in means for causing a more thorough admixture of air and gas, in means for regulating the flow of gas to the burners and to the pilot-light, and in other details of construction, all of which will be hereinafter fully described.

Referring to the accompanying drawings, which fully illustrate the novel features of my device, Figure 1 illustrates a side elevation of the lamp in its entirety. Fig. 2 represents a plan view of the burners with the globe and mantles removed and the gas-pipe in section as shown, taken on line 2 2 of Fig. 1. Fig. 3 illustrates a vertical section of the burners and connecting parts as shown, taken on a line 3 3 of Fig. 2. Fig. 4 represents an enlarged horizontal section taken on line 4 4 of Fig. 3, and Fig. 5 illustrates a detached vertical section of a modified form of regulating-valve.

Referring to the reference-letters of the drawings, A represents the gas-supply pipe; B, the support or bell; C C, &c., the mixing-tubes; D D, &c., the burners; E E, &c., the mantles; F, the valve, and G G, &c., the pilot-light tubes.

The gas-supply pipe A is united to the casing or valve-seat F' of the valve F by a threaded coupling A', which also serves to secure the bell in position by securing it against a flanged portion f, formed at the top of said casing.

The support B is preferably in the form of a bell, as best shown in Figs. 1 and 3. It is open at its latter end to permit the free ingress of air, and its vertical side walls are provided at diametrically opposite points with openings communicating with the mixing-tubes above referred to, which tubes pro-

ject radially from the bell in a nearly horizontal direction and are then curved upwardly until their upper ends and the burners and mantles which they carry project in a vertical direction.

The valve-casing F' is provided with a number of small nozzles f' f', &c., which are detachable and which are adapted to register with opening f<sup>2</sup> in the valve F, so that by turning the valve-stem F<sup>2</sup> to the position shown in Fig. 3 gas will enter through the opening f<sup>3</sup> in the valve F and pass through the nozzles f' to the mixing-tubes C. The valve-casing F' is provided with openings arranged above the valve to receive the tubes G. These tubes, which are in direct communication with the gas-pipe A, pass through the mixing-tubes C and through central openings in caps D', secured to the top of the burner-heads D. The tubes G are of small internal diameter, permitting a minute quantity of gas to pass from the pipe A, which being ignited at the burner-heads produces a small jet which it is desired to keep constantly burning, so that as the mixed air and gas emerge from the burner-caps D' it will be at once ignited by these jets, which constitute pilot-lights. For the purpose of producing a more thorough admixture of air and gas in the mixing-tubes, especially where large quantities are used to produce a light of high candle-power, it is desirable to make the tubes G in the form of a steep pitched spiral, as indicated at G' in Fig. 3, so that the air and gas will pass through the tube with a whirling motion, which has a tendency to produce a more thorough mechanical mixture. In addition to the burner-caps D' the heads D are provided with fine-wire-gauze screens D<sup>2</sup>, which, as is well known, will diminish the tendency to back-firing in the mixing-tubes when the valve is operated to turn on or shut off the supply of gas.

It may be desirable in some instances to cut off the supply of gas to the tubes G after the gas has been allowed to pass through the nozzles f', and, moreover, it may be found preferable by some consumers to employ a valve having a slow and more delicate means of adjustment. With this end in view I have illustrated in Fig. 5 a valve somewhat modi-



fied by which both the main and pilot burners may be shut off and in which the opening of the main supply is comparatively slow to afford ample time for the mixed air and gas to reach the burner-heads before the supply to the pilot-lights is cut off. To accomplish this, the casing  $F^x$  is provided with a valve-stem  $F^{xx}$ , threaded to a cap  $f^x$ , which is fitted to said casing, and the valve-stem has two valves  $f^{xx}$  and  $f^{xxx}$ , the former controlling the passages  $f''$ , leading to the pilot-burners, and the latter controlling the supply to the nozzles  $f'''$ . In this type of valve a tight joint is established to prevent leakage around the valve-stem by the lowered tapered side of the valve  $f^{xxx}$ , abutting against a corresponding taper on the upper side of the cap  $f^x$  when the valve is full open.

The mantles E surrounding the burner-heads are supported by rods  $e$ , which are detachably secured to a collar  $e'$ , fastened to the gas-pipe A. The burner-heads and mantles are inclosed in a globe H, the open ends of which are provided with rings  $H'$  and  $H^2$ , the former being provided with supports  $h'$   $h'$ , which are connected to a collar  $h^2$ , fastened to the gas-pipe A by a set-screw  $h^3$ . Above the globe is a hood I, which may be of any shape or size desired. This hood is held in place by being confined between the covering or casing J, surrounding the gas-pipe A, and the nut K, adapted to the upper portion of the gas-pipe, as illustrated in Fig. 1.

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

1. A gas incandescent lamp, comprising a bell having an opening for the ingress of air, a central gas-pipe projecting into and terminating in the bell and having gas-discharge orifices, a series of curved mixing-tubes projecting outwardly and upwardly from openings in the side walls of the bell in alinement with the gas-discharge orifices, and burner-heads mounted on the mixing-tubes, substantially as described.

2. A gas incandescent lamp, comprising a bell having an opening for the ingress of air, a central gas-pipe projecting into and terminating in a cap in the bell, radial gas-discharge nozzles in said cap, openings in the side walls of the bell opposite the nozzles, curved mixing-tubes leading outward and upward from said openings, and reticulated burner-heads mounted on the mixing-tubes, substantially as described.

3. A gas incandescent lamp, comprising a gas-supply pipe, a cap secured thereto having gas-discharge orifices, a bell secured between the gas-pipe and cap and surrounding the cap, curved mixing-tubes projecting upwardly from the bell, and burner-heads adapted to the mixing-tubes provided with reticulated plates, substantially as specified.

4. A gas incandescent lamp, comprising a bell having an opening for the ingress of air, a gas-pipe projecting into and terminating in

a cap inclosed by the bell, a discharge-nozzle projecting from the cap, an opening in the side wall of the bell opposite said nozzle, a curved mixing-tube leading outwardly and upwardly from said opening, a valve in the cap controlling the discharge-nozzle, and a small pilot-light tube leading from the gas-tube and extending through the mixing-tube to the burner-head, substantially as described.

5. A gas incandescent lamp, comprising a gas-supply pipe provided at one end with a discharge-nozzle, a valve to regulate the flow of gas to said nozzle, a bell inclosing the nozzle and valve and having an opening for the ingress of air, a mixing-tube projecting upwardly from the bell, an incandescent burner-head mounted upon said mixing-tube, and a coiled tube of small diameter connected to the gas-pipe and extending through the mixing-tube to the top of the burner-head, substantially as specified.

6. A gas incandescent lamp, comprising a gas-supply pipe provided with a discharge-nozzle, a mixing-tube, a burner-head mounted thereon, a coiled tube of small diameter connected to the gas-pipe and extending through the mixing-tube and burner-head, and a valve to regulate the flow of gas to said tubes, substantially as specified.

7. A gas incandescent lamp comprising a gas-supply pipe, a valve mounted thereon provided with a discharge-opening, a mixing-tube, an incandescent burner-head mounted upon said mixing-tube, a coiled tube in said mixing-tube one end of which is connected to the valve and the other to the top of the burner, and means to close communication between the coiled tube and the gas-supply pipe when the main supply of gas is open, substantially as specified.

8. A gas incandescent lamp, comprising a gas-supply pipe, provided with a discharge-nozzle, a mixing-tube, an incandescent burner mounted thereon, a pilot-light comprising a coiled tube connected at one end to the gas-pipe and at the other to the burner-head and a valve adapted to shut off the supply of gas to the pilot-light when a supply of gas is admitted to the burners and to open the supply to the pilot-light when the supply to the burner is cut off, substantially as specified.

9. A gas incandescent lamp, comprising a gas-supply pipe, having a number of discharge-orifices, a bell surrounding the same having an air-inlet opening, a series of curved mixing-tubes projecting upwardly from the bell, incandescent burner-heads mounted upon said mixing-tubes, a pilot-light in each of the burners comprising a spiral tube of small diameter in communication with the gas-pipe at one end and with the burner-head at the other, and a valve in said gas-pipe adapted to alternately cut off the supply of gas to the pilot-light and burners, substantially as specified.

10. A gas incandescent lamp, comprising a



bell having an open mouth providing a valve-  
less opening for the ingress of air, a central  
gas-pipe projecting into and terminating in  
and inclosed by the bell, a series of openings  
5 in the side walls of the bell, gas-discharge  
nozzles projecting radially from the central  
pipe in line with the openings, a series of  
mixing-tubes leading from the openings in  
the walls of the bell, said tubes extending  
10 radially outward and curving upward in a

vertical direction, burner-heads carried at the  
upper ends of said tubes, and reticulated  
plates in said heads.

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

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Witnesses:

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