

No. 717,482.

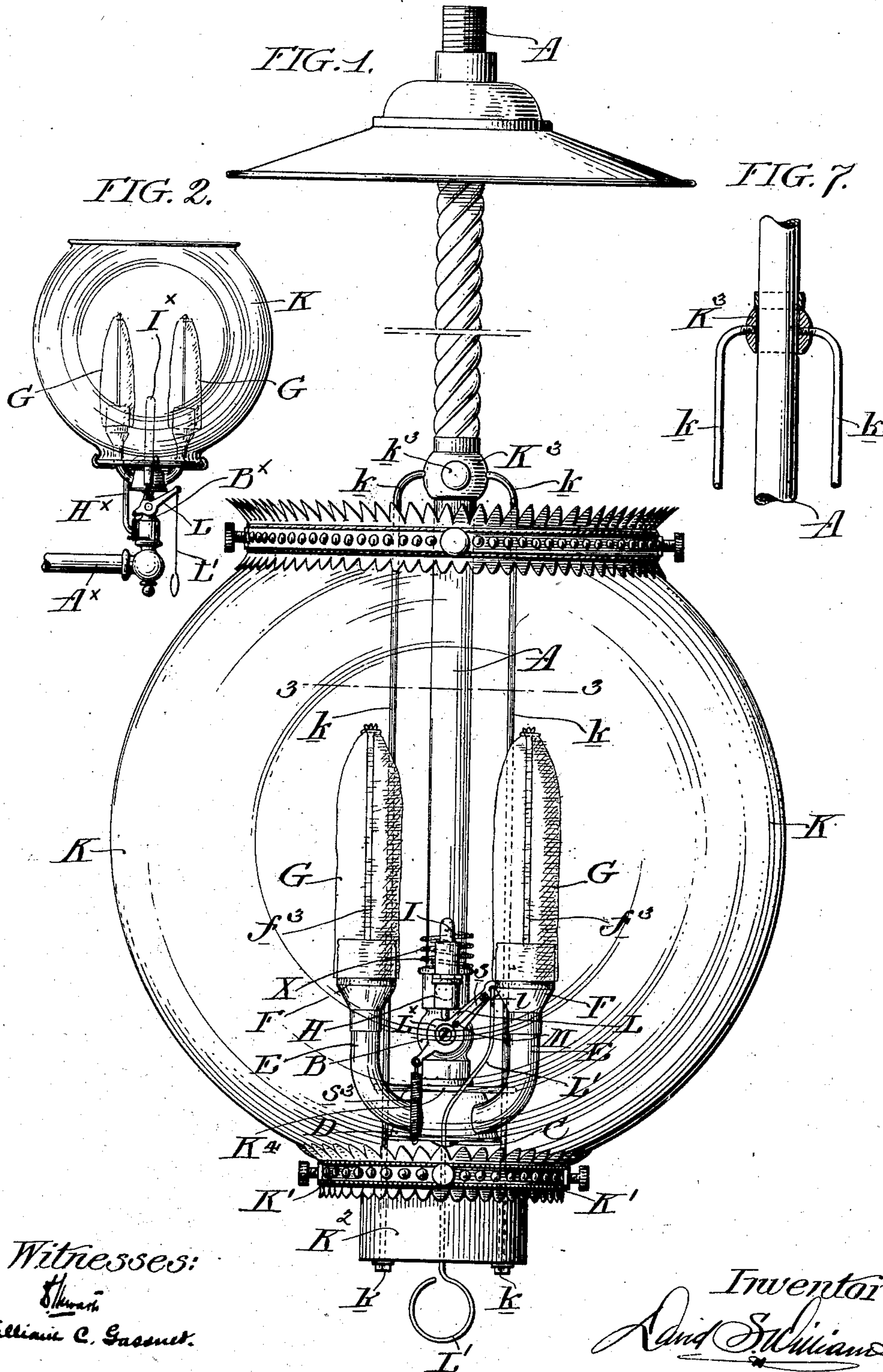
Patented Dec. 30, 1902.

D. S. WILLIAMS.
GAS INCANDESCENT LAMP.

(Application filed July 18, 1902.)

(No Model.)

2 Sheets—Sheet 1.



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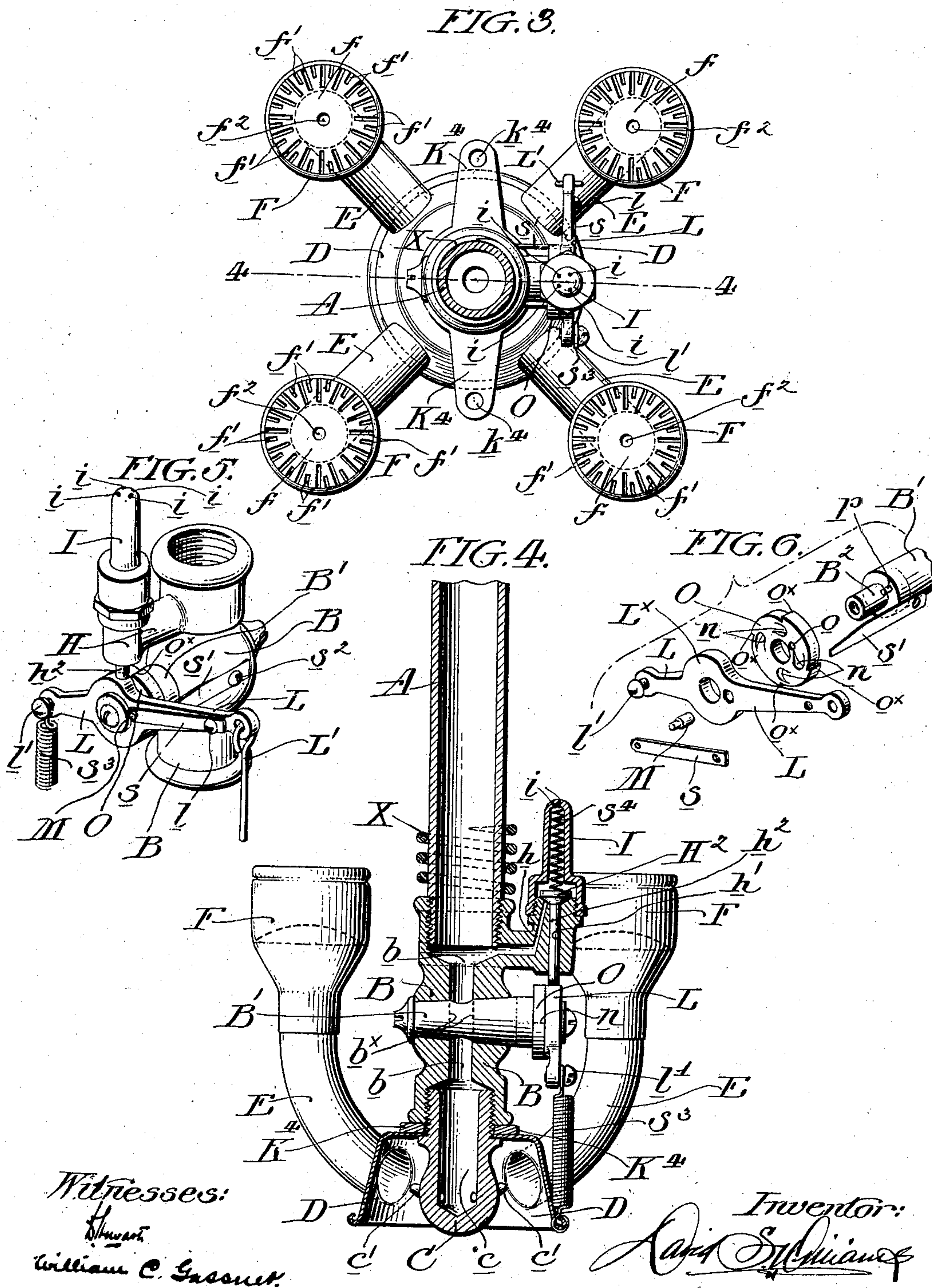
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UNITED STATES PATENT OFFICE.

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GAS INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 717,482, dated December 30, 1902.

Application filed July 18, 1902. Serial No. 116,028. (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 more specifically consists of an improved form of lamp in which a cluster of burners is employed using a mixture of air and gas and provided with filamentary baskets or mantles capable of becoming incandescent.

My invention consists in a novel arrangement of the burners by which they are supported and supplied with a proper volume of mixed air and gas from a common receptacle or bell.

My invention further consists in means for regulating the flow of gas to the burners, together with a mechanism for lighting the burners after the gas and air has been admitted thereto, and in other details of construction incident to a lamp of this character, all of which will be hereinafter fully illustrated and described.

Referring to the accompanying drawings, illustrating the novel features of my invention, Figure 1 illustrates a side elevation of a pendent lamp, showing the manner in which the parts are arranged in a cluster around the gas-pipe. Fig. 2 illustrates a similar view of a bracket-lamp in which the gas-supply pipe enters from below. Fig. 3 represents a vertical section taken on the line 3 3 of Fig. 1, showing the relative position of the lighting mechanism and burner-heads, the globe and its supporting-frame being removed. Fig. 4 illustrates a vertical section of the type of lamp shown in Fig. 1, the section being taken on line 4 4 of Fig. 3, with the globe and upper portions of the lamp broken away. Fig. 5 shows a perspective view of the valve and lighting attachment as applied to the form of lamp illustrated in Fig. 1. Fig. 6 illustrates a perspective view of the movable parts controlling the valve and lighting attachment detached from the body of the valve. Fig. 7 represents a detached vertical section of the

upper portion of the sliding frame, showing the manner of uniting the depending rods to the ring surrounding the gas-supply pipe.

Referring to the letters of reference, A represents the gas-supply pipe, which, as shown in Figs. 1, 3, and 4, is brought down from above and threaded to a valve B, which in turn is secured to a plug C, provided with discharge-nozzles c' . Firmly secured at the junction of the valve B and plug C is a support or bell D, which is open at the bottom and has secured to its periphery a number of curved mixing-tubes E, each of which has a burner-head F, provided with a reticulated top f . The top portion f' of the burner-heads is constructed in the form of a circular metal plate, the rim being milled out, forming a number of radial slots f' for the discharge of mixed air and gas.

The center of the plate f is provided with a hole f^2 to receive a rod of refractory material f^3 , which is forked at the top to receive a loop by which the mantles G are suspended.

The gas which is supplied to the burners passes through the pipe A, thence through the passage b in the valve B, and through the opening c in the plug C to the nozzles c' .

The nozzles c' are so arranged that as the small streams of gas enter the mixing-tubes E a current of air is induced and carried with the gas into the mixing-tubes in the ordinary way, except that the proper admixture in the present case is determined by the area of the bell and relative size of the jets or streams of gas, so that no shutters or regulating device for the air is required.

Where the pressure ranges above or below what may be taken as standard city pressure, the nozzles c' , which are detachable, can be replaced by others adapted to meet the requirements. By the employment of this arrangement of the parts the speed of the gas, as well as the speed of the mixture of gas and air, is not curtailed in its passage to the burners, and a sufficient mechanical mixing of the gas and air is afforded by the curvature of the mixing-tubes, which is not sufficient to offer more than the necessary resistance required to cause the gas and air to properly commingle. On the valve B is an extension H, having a channel h , com-

municating with the passage b , and upon this extension is threaded a cap I, having a series of radial openings or jets i , corresponding in number to the burner-heads. This construction constitutes a pilot-burner, which is designed to be kept constantly burning with a small flame, but which may be increased for the purpose of lighting the main burners, as will be presently shown.

10 The supply of gas to the burners F is controlled by a tapered plug or key B', provided with an opening b^x , which is turned by a lever L through the medium of a depending rod L'. The lever L is loosely journaled on
15 the reduced end B² of the plug B' and has a leaf-spring S fastened to it at one end by a screw l , the other end of the spring being provided with an opening to receive the reduced end of a pawl M, which engages inclines or depressions n in the face of a ratchet-wheel O. The ratchet-wheel alluded to fits snugly upon the reduced end B² of the plug B' and is caused to turn with the plug by a pin p , which is driven tightly into the
25 plug and projects into an opening o in the ratchet-wheel. In short, the pin constitutes a key which causes the ratchet-wheel to turn with the plug. The periphery of the ratchet-wheel is provided with teeth o^x , to which is adapted a leaf-spring S', fitted to the body of the valve and held by a screw S². The lever L is normally held in the position shown in Fig. 1 by a spiral spring S³, one end of which is fastened to the short arm of the lever L by
35 a screw l' , the other end being fastened to the bell D.

From the above description and by reference to Fig. 4 of the drawings, which shows the passage of the valve open, it will be seen
40 that by pulling the rod L' down to the full extent of its movement the passage will be closed and that by releasing the rod and again pulling it down the passage in the valve will be opened, as illustrated in the figure
45 above referred to.

The lever L, in addition to operating the main valve in the manner just described, also controls a valve in the pilot-burner, so that for a time when the main valve is full
50 open the jets of the pilot-burner are burning with a full head of gas; but as the rod controlling the lever L is released the spring controlling it returns it to its normal position and cuts off the full supply of gas to the pilot-burner. This is accomplished by the following mechanism: In the extension H, apart from the channel h , is a central opening h' , in which is guided the stem h^2 of a valve H². This valve is seated in the extension and
60 acted upon by a spiral spring S⁴, which normally tends to close the open end of the channel h . The valve-stem h^2 rests upon the central portion or hub L^x of the lever L, which is constructed in the form of a cam, so that
65 in the position that the valve-stem occupies, as indicated in Figs. 1 and 4, the valve H² nearly closes the top of the channel h , and

consequently a very small flame would be produced at the top of the cap I. When, however, the lever is moved to the position
70 shown in Fig. 5, the valve-stem h^2 would be brought into engagement with the higher portion of the hub L^x and the jets in the cap I would burn with a full head of gas and cause tongues of flame of sufficient length to ignite
75 all of the main burners.

The burner-heads and mantles surrounding the same are inclosed in a globe K, which is supported from the bottom by a ring K', the central depending portion K² of which is
80 connected to rods k k , which project upward and are joined to a ring K³. The ring K³ loosely surrounds the gas-pipe A and is normally held in close contact therewith by a set-screw k^3 . The rods k k are guided and
85 held against turning by a plate K⁴, which has projecting arms provided with openings k^4 k^4 to receive the rods and is firmly held in place between the valve B and plug C.

When the globe K and its connecting parts
90 comprising the supporting-frame are lowered, the ring K³ will rest upon the spring X, which, surrounding the lower part of the gas-pipe A, serves as a cushion to check such vibration as might occur in lowering the globe too
95 hastily.

In Fig. 2 of the drawings I have illustrated a modification in which the gas is admitted from below, as would be preferable in all forms of bracket-lamps in use where gas cannot be conveniently admitted from above.
100 In this type of lamp the principal parts are the same, and they have been designated by similar letters of reference. One of the principal points of difference between the preferred form shown in Fig. 1 and the modified structure of Fig. 2 is the location of the pilot-burner, which in Fig. 2 is located centrally between the burners, thus occupying the same position as the gas-pipe A in Fig. 1. In
110 addition to this the pilot-light in Fig. 2 is supplied with gas from the pipe A^x by means of a branch pipe H^x, which passes from the lower side of the valve B^x to the pipe I^x, arranged above the valve, the pipe I^x being
115 provided with a regulating-valve and other parts similar to those pointed out in Fig. 1.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—
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1. In a gas-lamp, the combination of gas-pipe, burners and their connections, a pilot-burner in open connection with the gas-pipe, a valve adapted to supply and cut off the flow of gas to the burners, and a valve to vary
125 the flow of gas to the pilot-burner simultaneously with the opening of the valve to the burners, substantially as specified.

2. In a gas-lamp, the combination of a gas-supply pipe and burners, a pilot-burner connected to the gas-pipe, a valve to open and cut off the flow of gas to the burners, a valve to vary the flow of gas to the pilot-burner and a connection between the valves to increase
130

the supply of gas to the pilot-burner as the valve is opened to the main burners.

3. In a gas-lamp, the combination of a gas-supply pipe and burners, a pilot-burner, in open connection with the gas-supply pipe and having a series of radial openings or jets corresponding with the number of burners, a valve adapted to increase the flow of gas to the pilot-burner as the main valve is opened and to diminish the flow to the pilot-burner after the burner has been lighted, substantially as specified.

4. In a gas-lamp, the combination with the gas-supply pipe and burners, a main valve controlling the gas-supply to the burners, a pilot-burner, a valve adapted to vary the supply of gas to the pilot-burner, a pawl-and-ratchet mechanism to open and close the main valve, and a cam controlled by said mechanism to operate the pilot-burner valve, substantially as specified.

5. In a gas-lamp, the combination with the gas-supply pipe and burners, a main valve controlling the same adapted to turn, a pilot-burner comprising a pipe in open connection with the gas-pipe, having at the end a series of radial openings or jets, a valve in said pipe adapted to slide and to vary the flow of gas to the pilot-burner, and a mechanism to cause the valve of the pilot-burner to open as the main valve is opened, and return to position after the main valve has been fully opened, substantially as specified.

6. In a gas-lamp, the combination with the gas-supply pipe and burners in line of connection therewith, a main valve controlling the supply of gas to the burners, a pawl-and-ratchet mechanism to operate the valve, a pilot-burner, a valve adapted to vary the flow of gas to the pilot-burner, and a cam on the ratchet-lever of the main valve adapted to operate the valve of the pilot-burner, substantially as specified.

7. In a gas-lamp, the combination of the gas-pipe provided with discharge-orifices, a main valve in said pipe, a bell connected to said gas-pipe, a plurality of mixing-tubes projecting therefrom, reticulated burner-heads mounted on the ends of the mixing-tubes, a pilot-burner comprising a pipe having an end provided with radial openings or jets, a valve to vary the flow of gas to the pilot-burner, a ratchet mechanism, controlling the main valve, and a cam-lever adapted to operate the main valve and simultaneously move the valve controlling the pilot-burner, substantially as specified.

8. In a gas-lamp, the combination of the gas-supply pipe provided with discharge-orifices, a hollow bell connected thereto, a plurality of curved mixing-tubes projecting upwardly from the bell, reticulated burner-heads mounted upon said mixing-tubes, a globe surrounding the burner-heads and mixing-tubes, a slidable frame guided upon the gas-pipe to support the globe, and means to

hold said frame normally in position, substantially as specified.

9. In a gas-lamp the combination of the gas-supply pipe, detachable nozzles arranged upon the discharge end thereof, a hollow bell connected to the gas-pipe, a plurality of curved mixing-tubes projecting upwardly therefrom, reticulated burner-heads mounted upon the mixing-tubes, a valve controlling the supply of gas to the burners, a pilot-burner comprising a tube having at its end a series of radial openings or jets corresponding in number with the burner-heads, a valve controlling the gas to the pilot-burner and a lever adapted to operate simultaneously the main valve, and valve controlling the pilot-burner, substantially as specified.

10. In a gas-lamp, the combination of the gas-supply pipe provided with discharge-orifices, a hollow bell connected thereto, a plurality of curved mixing-tubes projecting upwardly from the bell, reticulated burner-heads mounted upon the mixing-tubes, a main valve controlling the gas to the burners, a pilot-burner and comprising a tube in line with the gas-supply pipe provided at its end with a series of radial openings or jets corresponding in number with the burner-heads, a valve to control the supply of gas to the pilot-burner and a mechanism to simultaneously operate both of said valves in the manner described.

11. In a gas-lamp, the combination of the burners and gas-supply pipe, the globe surrounding the burners, the globe-supporting frame comprising two or more rods united to a ring slidable upon the gas-pipe, fixed guides for said rods connected to the gas-pipe, and means for holding the frame in position, substantially as specified.

12. In a gas-lamp, the combination of the burners and gas-supply pipe, the globe surrounding the burners, a ring supporting said globe, upright rods connected at one end to the ring, and at the other end to another ring embracing the gas-pipe, a guiding-plate for said rods secured at the bottom of the gas-pipe, and a thumb-screw for securing the upper ring to the gas-pipe, substantially as specified.

13. In a gas-lamp, the combination of the burners and gas-supply pipe, the globe surrounding the burners, a ring supporting said globe, a slidable frame carrying said ring guided and supported upon the gas-supply pipe, means for holding said frame in position, and a spring surrounding the gas-pipe and adapted to support the frame when the globe is lowered, substantially as specified.

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

DAVID S. WILLIAMS.

Witnesses:

WILLIAM C. GASSNER,
D. STEWART,