J. & G. G. DOORENBOS.

LAMP.

APPLICATION FILED MAR. 12, 1908.

917,421.

Patented Apr. 6, 1909.

3 SHEETS—SHEET 1.

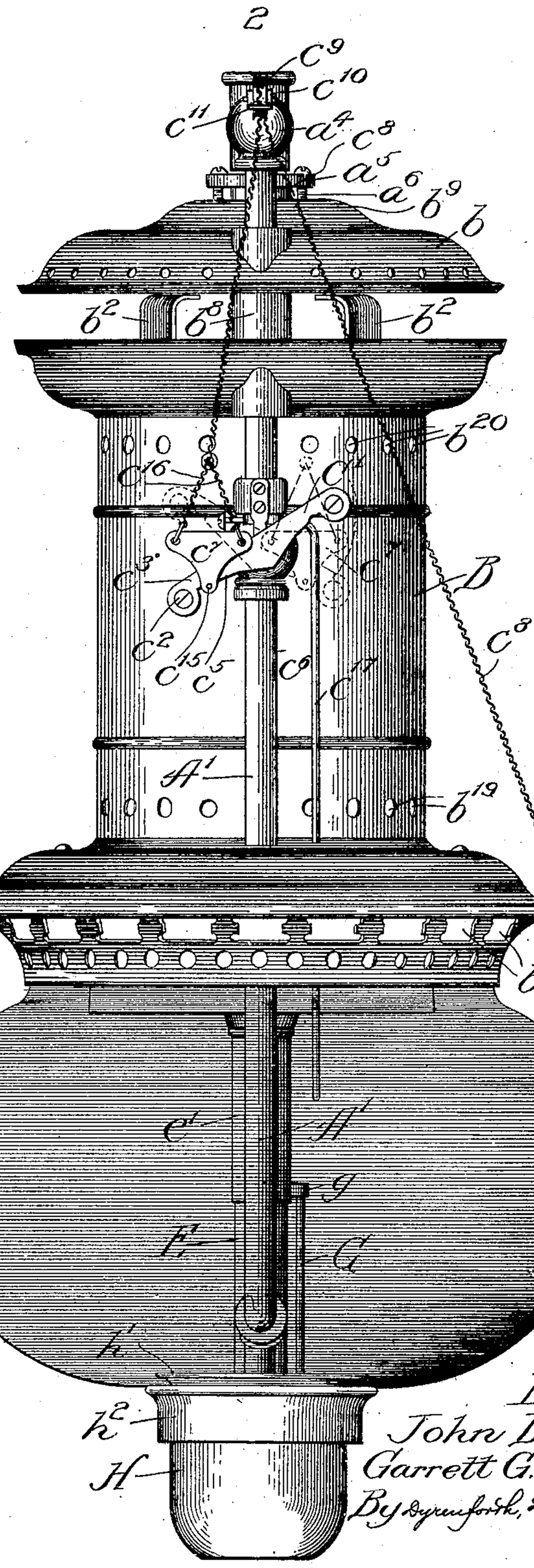

Fig. 1.

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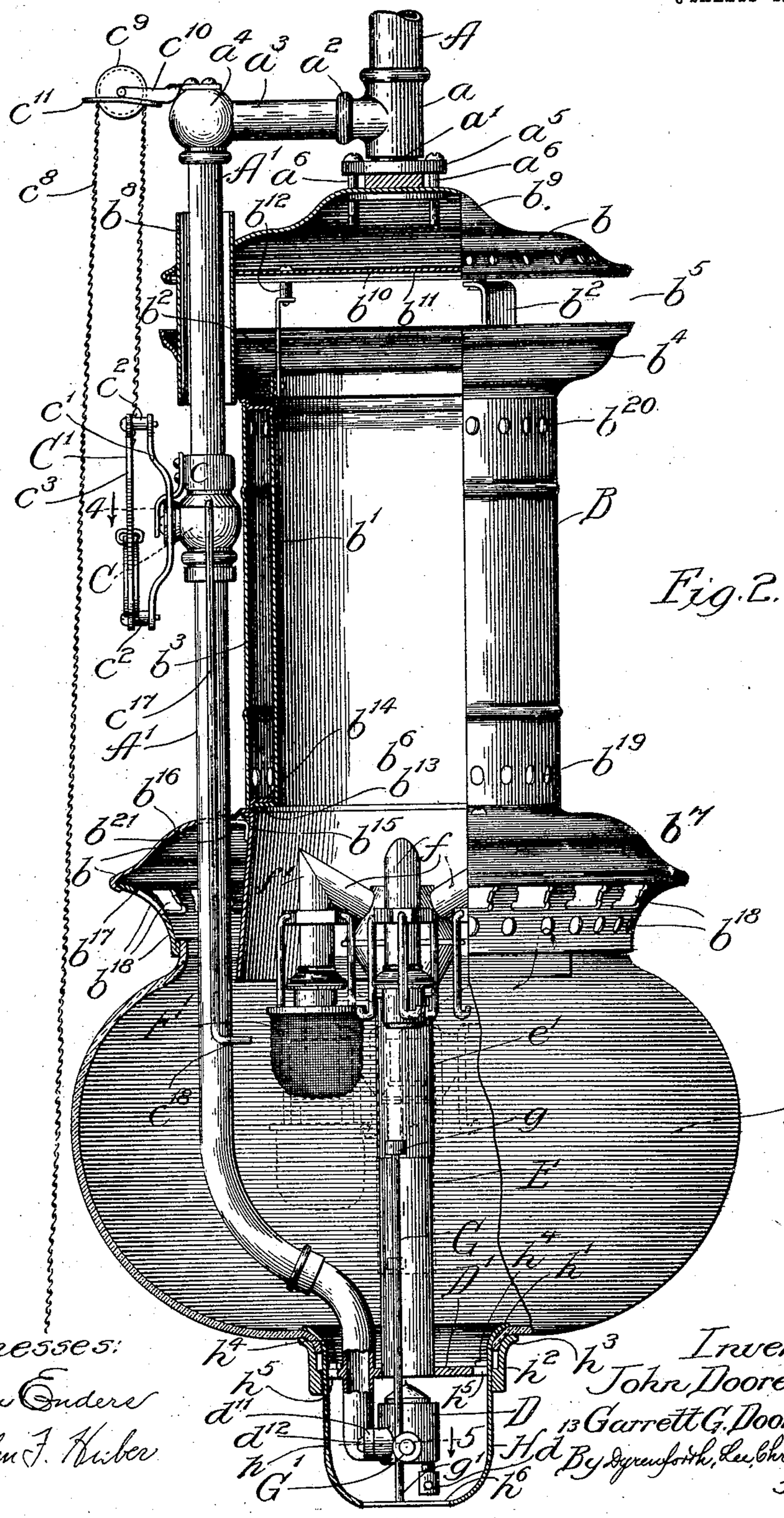

Fig. 2.

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3 SHEETS—SHEET 3.

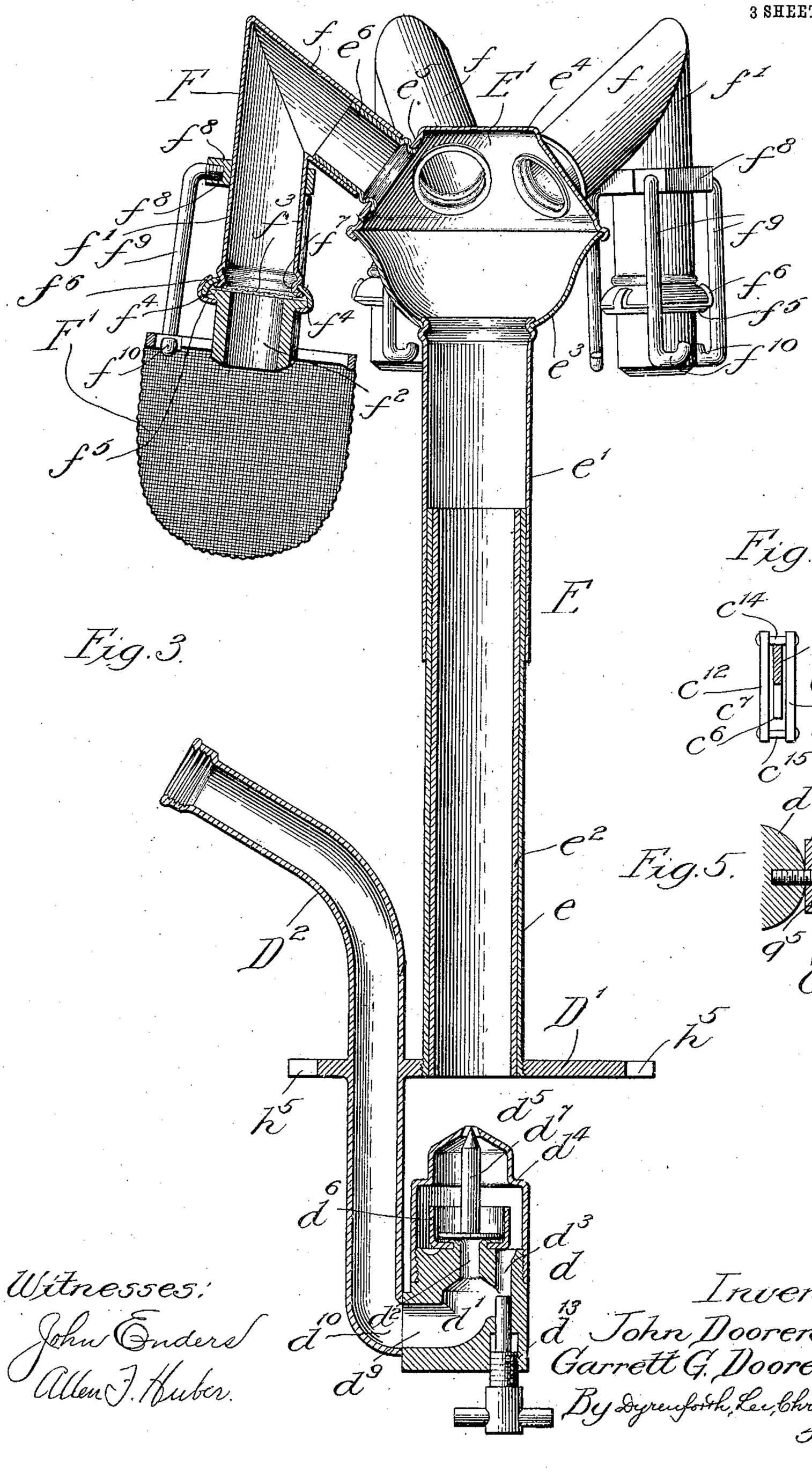

Fig. 3.

Fig. 4.

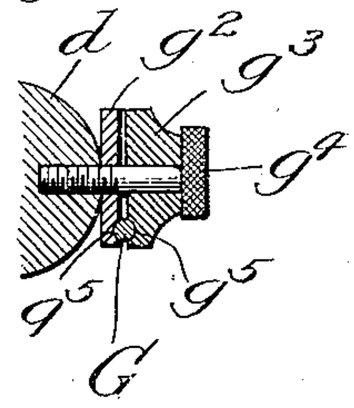

Fig. 5.

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UNITED STATES PATENT OFFICE.

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LAMP.

No. 917,421. Specification of Letters Patent. Patented April 6, 1909.

Application filed March 12, 1908. Serial No. 420,611.

To all whom it may concern:

Be it known that we, JOHN DOORENBOS and GARRETT G. DOORENBOS, citizens of the United States, residing at Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented a new and useful Improvement in Lamps, of which the following is a specification.

Our invention relates particularly to incandescent gas-lamps employing a cluster or group of burners, and mantles therefor; and our primary object is to provide a lamp of the character indicated of improved general construction.

The invention is illustrated in its preferred embodiment in the accompanying drawings, in which—

Figure 1 is a side elevational view of a lamp constructed in accordance with our improvements; Fig. 2, a view partly in section and partly in elevation, the section being taken as indicated at line 2 of Fig. 1; Fig. 3, an enlarged vertical sectional view of the mixing-tube, and the automatic valve controlling the admission of gas thereto, said mixing-tube being surmounted by a mixing-chamber with which are connected the cluster of gas-burners employed; Fig. 4, a section taken as indicated at line 4 of Fig. 2 and showing a detail of the means employed for actuating the valve which controls the admission of gas to the lamp; and Fig. 5, a broken section taken as indicated at line 5 of Fig. 2, and showing a detail of the clamping means employed for securing the actuating rod of the vertically adjustable upper section of the mixer-tube employed.

In the construction shown, A represents a gas-pipe from which the lamp is suspended and with which communicates a branch-pipe A^1; B, a chimney suspended from the pipe A; C, a valve controlling the passage of gas through the branch-pipe A^1 and equipped with actuating means C^1; D, an automatic valve regulating the passage of gas from the branch-pipe A^1 to the mixer-tube; D^1, a disk supported by a pipe D^2 connected with the lower end of the branch-pipe A^1, said pipe D^2 serving also to support the automatic valve D; E, a mixer-tube supported by the disk D^1 and comprising telescoping sections, the upper section being surmounted by a mixer-chamber E^1; F, a plurality of burner-tubes having down-turned orifices, said burner-tubes being carried by the chamber E^1 with the interior of which they communicate; F^1, mantles carried by the burner-tubes; G, an adjusting rod connected with the upper tube-section of the mixer-tube; G^1, clamping means for the rod G; H, a globe-support connected with the disk D^1; and H^1, a globe supported at its lower portion by the globe-support H and having its upper portion housed by the lower portion of the chimney B.

The lower end of the pipe A is equipped with a fitting *a* whose upper end has screw connection with the pipe and whose lower end is closed by a plug a^1. The fitting *a* is provided with a branch a^2 with which connects a laterally extending pipe-section a^3 which is joined by an elbow a^4 with the vertically disposed pipe A^1. The plug a^1 is flanged at its lower end and is fitted with a ring a^5 which is connected by screws a^6 with the cap of the chimney.

The chimney B, in the form shown, comprises a hollow cap, or top, *b*, suspended from the pipe A by means of the screws a^6; an inner chimney-pipe b^1 suspended from the chimney-top by means of brackets or hangers b^2; an outer chimney-pipe b^3 surmounted by an upwardly flaring bell b^4 separated from the cap *b* by a space b^5; an air-shield b^6 connected with the lower end of the inner chimney-pipe b^1; a hood or bell b^7 connected with the lower end of the outer chimney-pipe b^3; and a tube b^8 extending parallel with the axis of the chimney through the chimney-top *b* and the bell b^4, and affording a passage for the branch-pipe A^1.

The chimney-top *b* preferably comprises a dished or obtusely conical sheet-metal member b^9, a flat sheet-metal disk b^{10} connected with the lower edge thereof, and an asbestos disk b^{11} shielding the lower surface of the disk b^{10}. The brackets b^2 are supported by studs b^{12} depending from the disk b^{10}. The inner chimney-pipe b^1 is equipped at its lower end with an out-turned flange b^{13} upon which rests an inturned flange b^{14} with which the air-shield b^6 is provided at its upper end. The shield b^6 is equipped externally a short distance beneath the flange b^{14} with a flange b^{15} upon which the hood or bell b^7 is carried, and the lower end of the outer chimney-pipe b^3 fits over the upper end of the shield b^6 and bears upon the adjacent portion of the hood b^7. The hood b^7 comprises a downwardly and outwardly flaring upper member b^{16} and a downwardly and inwardly converging

lower member b^{17} whose upper margin is connected with the outer periphery of the member b^{16}, the member b^{17} being provided with air-inlets b^{18}. The lower end of the member b^{18} is of suitable size to receive the upper end of the globe H^1. The outer chimney-pipe b^3 is provided with a circular row of perforations b^{19} at its lower end and with a similar row of perforations b^{20} at its upper end, thus providing for the circulation of air between the inner and outer pipes of the chimney. The shield b^6 is equipped externally with brackets b^{21} whose outer or free ends are connected with the upper member b^{16} of the hood b^7. The member b^{16} is provided with a perforation through which the pipe A^1 extends.

Beneath the tube b^8, the pipe A^1 is equipped with a valve-casing c and valve C. The valve is an ordinary plug valve whose outer end is equipped with a double-arm actuating lever c^1 whose extremities are equipped with outwardly extending studs c^2 upon which is mounted a guide c^3 which has a straight upper edge c^4 and a double-incline lower edge c^5 forming a central down-turned apex c^6. Upon the guide c^3 is mounted a slide c^7 with which is connected a chain c^8 which extends over a pulley c^9 journaled in a bracket c^{10} carried by the elbow or fitting a^4. The bracket c^{10} carries a guard c^{11} which serves to prevent the chain from getting off the pulley c^9. The slide c^7 preferably comprises two triangular plates c^{12}, c^{13} embracing the guide c^3, studs c^{14} connecting the plates above the member c^3, and a stud c^{15} connecting the apex of the plates c^{12}, c^{13} beneath the member c^{14}. The chain c^8 is equipped with branches c^{16} which connect with the extremities of the slide c^7. The free end of the chain c^8 extends to any convenient distance beneath the lamp, the chain being shown broken in Fig. 1. When the valve C is in either the fully closed or fully opened position, the guide c^3 occupies an inclined position, and the slide c^7 rests at the lower end of the guide. By pulling upon the chain, the valve may be operated either to close or open the valve. After actuation of the valve in one direction and release of the chain, the slide automatically shifts its position to the opposite end of the guide or lever upon which it is mounted, so as to be in readiness to turn the valve in the opposite direction, when desired.

Connected with the valve-casing c above the valve C is the tube c^{17} of the pilot-burner c^{18} which serves as a means for lighting the lamp. The tube c^{17} lies adjacent to the pipe A^1 and extends through the opening in the hood b^7 which is provided for said pipe. The lower portion of the pipe A^1 is contained within the globe H^1, as plainly appears from Fig. 2.

The automatic valve D is of the general construction shown in Doorenbos's patent No. 840,831 of January 8, 1907. It comprises a hollow body d with which the pipe D^2 communicates, said body having a chamber d^1 with a central outlet d^2 and a by-pass d^3; a removable cap d^4 having an orifice d^5; a cylinder d^6 having an opening in its bottom communicating with the passage d^2; and a needle-valve d^7 carried by a piston d^8 contained in the cylinder d^6. The member d has a lateral inlet d^9 leading to the chamber d^1; and the pipe d^2 has a laterally turned outlet d^{10} registering with the passage d^9. The lower end of the pipe D^2 has lugs d^{11} cast thereon, which are connected by screws d^{12} with the member d. The by-pass d^3 is regulated by a vertically disposed screw d^{13} which passes through the lower wall of the member d.

The disk D^1 preferably is cast integrally with the pipe d^2 which extends through the disk some distance from the axis thereof. At the axis of the disk is a threaded perforation which receives the lower end of the mixer-tube.

The mixer-tube E comprises a lower section e having its lower end threaded and screwed into the disk D^1, and an upper tube e^1, of larger diameter, telescopically connected with the tube e. Preferably, the tube e contains an inner tube e^2 which may be slipped out, when desired, to leave a larger passage. The chamber E^1 preferably comprises an upwardly flaring bell-shaped member e^3 through whose bottom the tube e^1 extends; and a cap-piece e^4 having a frusto-conical wall e^5 with which are connected nipples, or stub-tubes, e^6 upon which the burner-tubes F are removably mounted.

Each burner-tube F is of angular form, comprising an inclined tube-section f telescopically connected with one of the stub-tubes e^6; and a down-turned tube f^1 carried by the tube f. Each tube F is equipped at its lower end with a burner-tip f^2 of refractory material, back of which is located a gauze or screen f^3. By preference, the burner-tip f^2 has its upper edge equipped with a flange f^4 embraced by a ring f^5 provided with up-turned lugs f^6 which engage a flange f^7 provided at the lower end of the tube f^1. Each tube f^1 is equipped with a ring or flange f^8 from which depend mantle-supporting arms f^9, whose lower ends are equipped with hooks f^{10} adapted to engage the supporting arms or lugs of the mantle b^1.

As shown in Fig. 2, the rod G is connected at its upper end with the lug g carried by the lower end of the tube e^1, and said rod G passes through the clamping device G^1 and may be equipped at its lower end with any suitable handle (not shown). The clamping device G^1 is shown in detail in Fig. 5. It comprises an inner clamping washer g^2 bearing against the member d, an outer clamping washer g^3, and an adjusting screw g^4 which passes through said washers and into the perforation in the member d.

The washers are provided near one edge with complemental grooves g^5 through which the rod G extends.

The globe-support H preferably comprises a cup-shaped member h having an outwardly curved flange h^1 at its upper end; and a ring h^2 having threaded connection with the member h and provided with a flange h^3 curved to correspond with the curve of the flange h^1. The globe has a curved flange adapted to be confined between the flanges h^1 and h^3. The member h is equipped internally with lugs h^4 adapted to pass through slots h^3 with which the disk D^1 is provided. The cup-shaped member h is of large enough diameter to slip over the disk D^1, as shown. The lugs h^4 and slots h^5 afford a bayonet-joint connection between the member h and the disk D^1. The bottom of the cup-shaped member h is cut away to afford an opening h^6 which affords access to the rod G and the valve or screw d^{13}.

The manner of use will be readily understood from the foregoing detailed description. When the lamp parts are properly assembled and gas is admitted to the pipe A, gas will pass through the pilot burner c^{18}, so that a small flame may be maintained for lighting the burners. When it is desired to light the burners, it is only necessary to pull the chain c^8, which will operate to throw the valve C to the open position. Upon release of the chain, the slide c^7 will shift its position to the other end of its guide so as to be in readiness to close the valve when the chain is again pulled. With the valve C open, gas will be supplied through the automatically acting valve D to the mixer-tube; and air will be drawn through the opening h^6 of the globe-support in the mixer-tube, from whence the mixture will pass to the chamber E^1 and thence to the burners. Air will be drawn in through the openings b^{18} of the hood b^7 and deflected by the shield b^6, where the air will serve to complete the combustion. Experience has shown that the construction provides against the formation of carbon or soot upon the mantles. When it is desired to replace the mantles, the vertically adjustable mixer-tube e^1 which carries the chamber E^1 and the burners mounted thereon, may be lowered through the medium of the actuating-rod, and the burners may be removed from the stub-tubes e^6 upon which they are mounted and the mantles replaced. Afterward the tube e^1 may be elevated to its normal position where the burners and mantles will be shielded from direct access of air entering through the openings b^{18} of the hood b^7.

It is to be observed that the provision of the apex c^6 at the lower edge of the guide c^3 and the stud c^{15} adapted to engage the lower edge of the guide c^3 obviates any danger of the slide c^7 stopping at a dead center, even though the valve C should be carelessly actuated, since the slide would always slip from the apex in one direction or the other, even though the guide c^3 should occupy a horizontal position when the pull upon the chain is exerted.

The foregoing detailed description has been given for clearness of understanding only, and no undue limitation is to be understood therefrom.

What we regard as new, and desire to secure by Letters Patent, is—

1. In a lamp, the combination with a burner and a supply pipe, of a valve equipped with an actuating lever, and an automatically shifting actuating member connected with said lever and through the medium of which said valve may be turned in either direction.

2. The combination with the supply pipe of a lamp, of a valve equipped with an actuating lever, a shiftable slide mounted on said lever, and a flexible member connected with said slide and serving to actuate said valve through the medium of said slide.

3. The combination with the supply-pipe of a lamp, of a valve, a guide connected therewith having a substantially straight upper surface and a double-incline lower surface, a slide mounted on said guide and a flexible member serving to actuate said slide.

4. The combination with the supply-pipe of a lamp, of a valve equipped with a two-arm lever, a guide member connected with said lever and having a straight upper edge and a double-incline lower edge, a slide mounted on said guide provided with a small bearing adapted to engage the lower edge of said guide, and a flexible member connected with said slide.

5. The combination with the supply-pipe of a lamp, of a valve equipped with a guide extending on opposite sides of the valve, a slide mounted on said guide, a wheel journaled above said valve, and a chain connected with said slide and passing about said wheel.

6. In a lamp, the combination with a pipe, a chimney located beneath said pipe, a branch-pipe located at one side of the chimney and equipped with a valve disposed in axial alinement with the chimney, a mixer-tube above said valve, burners supplied by said mixer-tube, a globe-support carried by said branch-pipe, and a globe carried by said globe-support and removable therewith, said globe and globe-support inclosing the lower portion of said branch-pipe.

7. In a lamp, the combination of a pipe, a chimney suspended therefrom and provided at its upper portion with a cap having an opening therethrough near one edge thereof, a branch-pipe extending through said opening, a valve connected with said branch-pipe and located adjacent to one side of the chimney beneath said opening, a hood connected with the lower portion of said chimney through which said branch-pipe

extends, a disk connected with said branch-pipe and equipped with a mixer-tube rising therefrom, a valve disposed beneath said mixer-tube and controlling the passage of gas from the branch-pipe to the mixer-tube, a globe-support detachably connected with said disk, and a globe carried by said globe-support.

8. In a lamp, the combination with a chimney provided with an air-shield, of a mixer-tube located beneath said chimney, means for supporting said chimney and mixer-tube, burners carried by and supplied from said mixer-tube, and means for lowering said mixer-tube with relation to the chimney.

9. In a lamp, the combination with a chimney, of a mixer-tube section, means for supporting said chimney and mixer-tube, means for raising and lowering the same, a chamber surmounting said mixer-tube section, burner-tubes detachably connected with said chamber, and mantles carried by said burner-tubes.

10. In a lamp, the combination of a pipe, a disk carried thereby, a mixer-tube section rising from said disk, a valve disposed beneath said mixer-tube section and communicating with said pipe, and a vertically slidable mixer-tube section connected with said first-named mixer-tube section and equipped with a plurality of burners.

11. In means of the character set forth, the combination with a lower mixer-tube section of a vertically slidable upper mixer-tube section, a surmounting mixer chamber equipped with a plurality of inclined tube-stubs, and angular burner-tubes telescopically mounted on said tube-stubs.

12. In a lamp, the combination of a pipe, a chimney suspended therefrom, a branch-pipe connected with said first-named pipe above said chimney and disposed at the side of said chimney, a valve connected with said branch-pipe equipped with an actuating lever, a shiftable slide connected with said actuating lever, a bracket carried by said branch-pipe above said valve, a wheel journaled in said bracket, a chain connected with said slide and passed about said wheel, an automatic valve controlling the passage from said branch-pipe, a mixer-tube disposed above said automatic valve, burners supplied by said mixer-tube, means carried by said branch-pipe supporting said automatic valve and said mixer-tube, and a globe inclosing the lower portion of said branch-pipe and said mixer-tube.

13. In a lamp, the combination of a pipe, a disk carried thereby, a mixer-tube carried by said disk, a valve controlling the passage from said pipe to said mixer-tube, said valve being carried by said pipe, and a globe-support detachably connected with said disk.

14. In a lamp, a mixer-tube section, a surmounting mixer-chamber having a frusto-conical surface equipped with inclined tube-stubs, angular burner-tubes having inclined portions telescopically connected with said tube-stubs, and having down-turned portions, and mantles mounted on the down-turned portions of said burner-tubes.

15. In a lamp, the combination of a pipe, a chimney-top suspended therefrom, a chimney-body suspended from said top, a hood connected with the base-portion of the chimney-body, said chimney-top and hood having a passage therethrough, a branch-pipe connected with said first-named pipe above said chimney-top and extending through the passage in the chimney-top and hood, a valve carried by said branch-pipe, a mixer-tube carried by said branch-pipe and disposed above said valve, and burners carried by said mixer-tube.

16. In means of the character set forth, the combination of a pipe, a disk carried thereby, a mixer-tube carried by said disk, a valve carried by said pipe and disposed beneath said mixer-tube, a globe-support carried by said disk, and a removable ring connected with the exterior of said globe-support, for the purpose set forth.

17. In a lamp, the combination of a chimney provided at its base with a hood supplied with air inlets, a shield located beneath said hood and depending beneath said air inlets, a supply-pipe, a mixer-tube carried thereby, and burners mounted on said mixer-tube adjacent to the lower end of said shield.

18. In means of the character set forth, the combination of a pipe, a disk carried thereby, a mixer-tube carried by said disk and having an adjustable section, a valve carried by said pipe and disposed beneath said mixer-tube, a globe-support connected with said disk and having an opening at its lower end, and means for actuating the adjustable section of the mixer-tube, said means accessible through said opening at the lower end of said globe-support.

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In presence of—
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