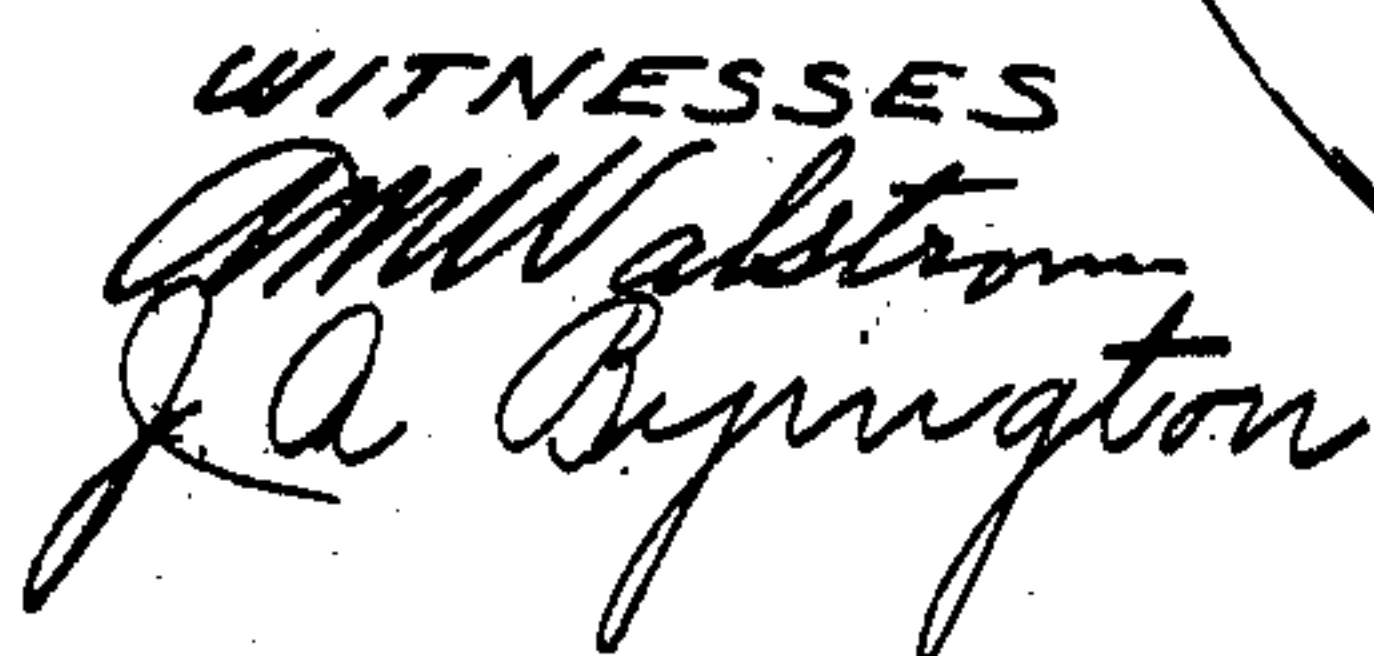


GAS LAMP.

**980,298.**

2 SHEETS—SHEET 1.



INVENTOR  
WILLIAM S. LEVINGS  
BY *Paul & Paul*  
HIS ATTORNEYS

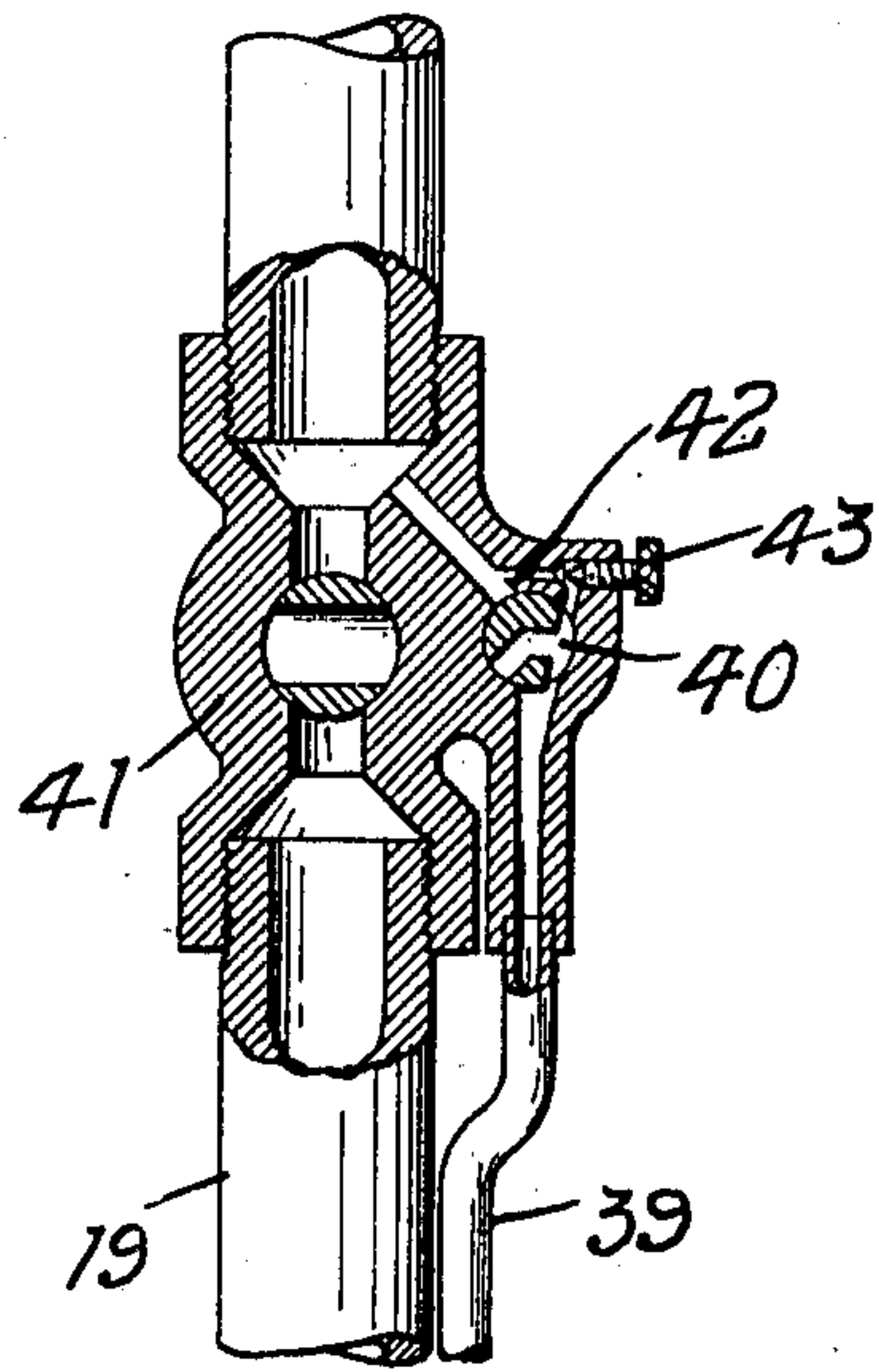
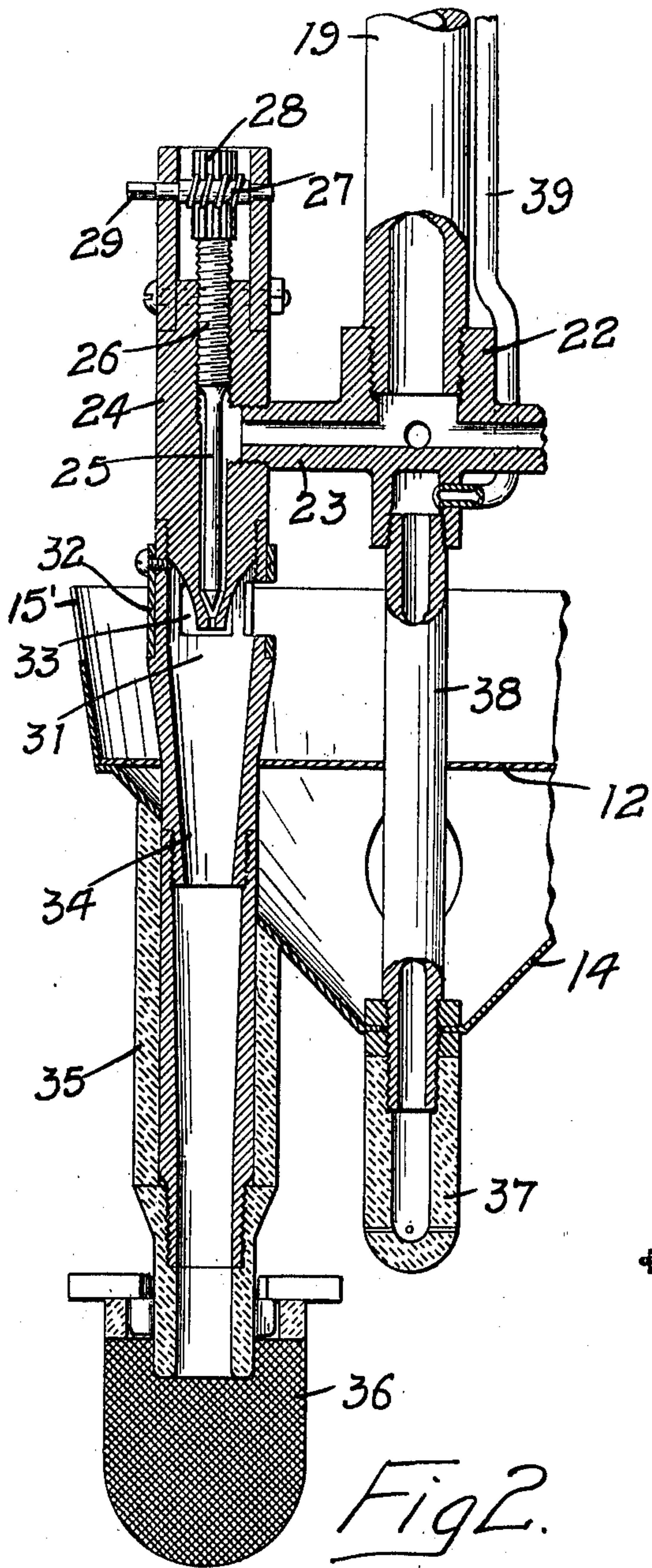
W. S. LEVINGS.  
GAS LAMP.

APPLICATION FILED MAY 28, 1908. RENEWED MAY 17, 1909.

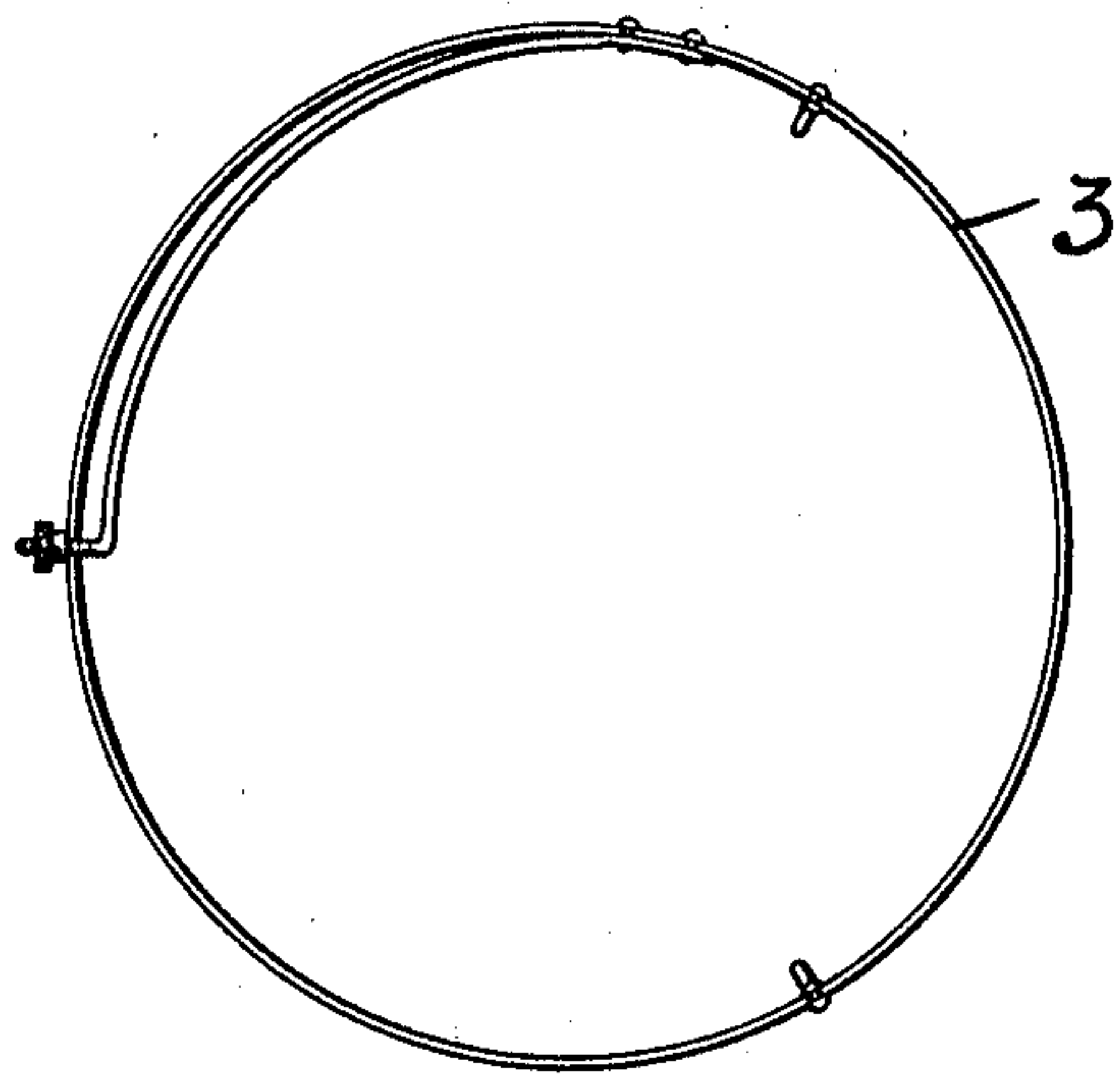
980,298.

Patented Jan. 3, 1911.

2 SHEETS—SHEET 2.



*Fig 4.*



*Fig 3. x-x*

WITNESSES  
*J. A. Byington*

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# UNITED STATES PATENT OFFICE.

WILLIAM S. LEVINGS, OF MINNEAPOLIS, MINNESOTA.

## GAS-LAMP.

980,298.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed May 28, 1908, Serial No. 435,411. Renewed May 17, 1909. Serial No. 496,650.

*To all whom it may concern:*

Be it known that I, WILLIAM S. LEVINGS, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful  
5 Improvements in Gas-Lamps, of which the following is a specification.

My invention relates to gas lamps and particularly to those of the inverted arc type.

10 The object of my invention is to provide a gas lamp of simple durable construction, one which will employ an entirely closed globe and be symmetrical and ornamental in its appearance.

15 A further object is to provide a lamp capable of throwing the rays of light outwardly and downwardly and eliminate all shadows under the lamp.

20 A further object is to provide a lamp that is easily accessible in all its parts for the purpose of cleaning and repairing.

Other objects of the invention will appear from the following detailed description.

25 The invention consists generally in a gas lamp having an inner and an outer casing with a passage between them for the products of combustion, said inner casing having upper air intake ports and lower discharge  
ports into said passage.

30 Further, the invention consists in a deck plate located within said inner casing near said discharge ports, and a conical deflector located below said deck plate and between which cone and deck plate a dead air space  
35 is formed.

Further, the invention consists in improved means for regulating the supply of gas to the burner.

40 Further, the invention consists in an improved by-pass valve, and further, the invention consists in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

45 In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation partially in section of a gas lamp embodying my invention. Fig. 2 is a detail sectional view through the lower portion of the inner casing showing the arrangement  
50 of the burners with respect thereto. Fig. 3 is a horizontal sectional view on the line  $x-x$  of Fig. 1. Fig. 4 is a detail sectional view of the by-pass valve.

In the drawing, 2 represents a globe closed except at the top and carried by a  
holder 3 that is secured to the outer casing  
or jacket 4 of the lamp by a series of straps  
5. Between these straps air intake openings  
6 are provided for the entrance of fresh air  
to the globe and the burner mantles. With-  
in the jacket 4 and depending therefrom is  
an annular shield 7, its lower edge depend-  
ing within the open top of the globe and in-  
closing the burners and tending to direct  
the air entering through the passages 6 to  
the bottom of the globe, thereby keeping its  
wall cool and delivering the pure air to the  
mantles at the proper point. By directing  
the fresh air down to the bottom of the  
globe I am able to prevent settling of the  
products of combustion therein. The shield  
7 also serves to direct the heated products  
of combustion upward. Within the jacket  
4 and held in concentric relation therewith  
by a series of brackets 8, is an inner casing  
or shield 9 separated from said jacket by an  
annular passage 10 through which the prod-  
ucts of combustion ascend and are dis-  
charged through the opening 11 at the top  
of said jacket. A deck plate 12 is provided  
at the lower end of the casing 9 above which  
in the wall of said casing I provide a se-  
ries of air exit ports 13 communicating with  
the passage 10, and below the said deck plate  
is a conical deflector 14 having an annular  
flange 15 at its upper edge which incloses  
the lower portion of the casing 9 and the  
air exit ports therein, a space 16 being  
formed between said flange and the wall of  
said casing through which the air from said  
exit openings may ascend and mingle with  
the products of combustion in the passage 10.

The casing 9 rests upon the deck plate and is provided with a series of pins 9' adapted to enter slots 15' in the upper edge  
of the flange 15 and center the casing 9 and the crown supported thereby so that the  
holes for the insertion of a key through the jacket and casing will always come in line  
with one another. The exit openings 13 are  
of sufficient size to provide proper circula-  
tion through the casing but do not in any  
way interfere with the passage of the prod-  
ucts of combustion up between the jacket  
and the casing. The cone 14 is made pref-  
erably of heavy sheet metal with its outer



surface enameled to deflect as far as possible the heat from the burners and direct the products of combustion up into the passage 10.

5 In the operation of the lamp the ascending products of combustion will create a suction through the exit ports 13 and the passage 16 and siphon the air out of the lower portion of the casing 9 above the deck plate, and I prefer to extend the flange 15  
10 above the exit openings 13 to prevent any reverse action and insure the circulation from the lower portion of the casing 9 outwardly into the products of combustion passage. The casing 9 is surmounted by a crown 17 having near its upper end a series  
15 of air intake ports 18 and slidably mounted upon a pipe 19, a slot 20 being provided in the upper end of the crown to receive a pin 21 on said pipe to support the crown and its attachments in their raised position.

A casting 22 is provided on the lower end of the pipe 19 having a series of arms 23 radiating therefrom and supporting a corresponding series of Bunsen burners 24. Needle valves 25 are provided for regulating the supply of gas to the burners and have threaded shanks 26 and are raised and lowered by means of screws 27 meshing with  
30 gears 28 on the shanks of said valves and having squared ends 29 to receive an operating key inserted through holes 30 in the jacket 4 and the casing 9.

35 A mixing chamber 31 has a ring 32 provided with ports 33 and capable of rotary adjustment for the purpose of regulating the admission of air to the burners. A tube 34 extends downwardly through the deck plate 12 and the deflector 14 and carries a sleeve 35 of refractory material to protect the tube from the heat of the burner. A mantle 36 is suspended at the lower end of the tube in the usual way.

45 I have illustrated in detail in Fig. 2 but one of the depending tubes and mantles, but it will be understood that a series of them are employed, provision being made for four in this lamp, arranged around a central pilot burner 37 connected by a tube 38 with  
50 the casting 22 and having a small pipe connection 39 with a by-pass valve 40 arranged in the valve 41 which controls the admission of gas to the supply pipe 19. The valve 40 has a duct 42 through which a small supply  
55 of gas is conducted around the valve 40 and a thumb screw 43 controls the flow of gas through this passage. The valves 40 and 41 are simultaneously opened to admit gas to the main supply pipe and to increase the  
60 flow to the pilot burner by means of an arm 44 mounted on the stem of the valve 41 and having a longitudinal slot 45 with which the arm 46 of the valve 40 has a sliding connection. A spring 47 normally holds the arm  
65 44 in its raised position with both valves

closed. When the arm is drawn down against the tension of its spring the valves will be opened and gas admitted to the burners.

The operation of the lamp is as follows:— 70  
Gas having been admitted to the burners and ignited the products of combustion will pass upwardly through the passage 10 between the jacket and the inner casing, the air above the deck 12 in the lower part of  
75 the casing 9 will be siphoned out through the exit openings 13 and fresh pure air will rush in through the ports 18 in the top of the crown 17 and flow downwardly within the casing 9 to the mixing chambers of the burners. A circulation will thus be established through the casing 9 and the crown 17 and the downward draft of cool air will protect the inner surface of the casing and prevent decomposition through the action of the  
85 heat from the burners. The circulation established through the inner casing will prevent stagnation of the air above the deck plate, and the presence of gas which might pass into and interfere with the proper action of the mixers. As stated, a dead air space is formed between the cone and deck plate, the temperature of which is kept sufficiently low to prevent all danger of disintegration of the cone. By means of this  
95 circulation of pure cool air the parts of the lamp are effectually preserved from overheating, an ample supply of air necessary for combustion is always present and the highest degree of efficiency from the burners  
100 is obtained.

I claim as my invention:

1. In a gas lamp, a jacket, a casing inclosed thereby and spaced therefrom, a supply pipe and mixers inclosed by said casing  
105 and burners depending below said casing, the passage between said casing and jacket forming an exit for the products of combustion from said burners and the upper portion of said casing having air intake  
110 openings and the lower portion of said casing having exit openings into said products of combustion passage, whereby a circulation of air will be established downwardly within said casing and outwardly from the  
115 lower portion thereof into said passage, substantially as described.

2. In a gas lamp, a jacket, a casing inclosed thereby and spaced therefrom and forming therewith a passage for the prod-  
120 uct of combustion, a gas supply pipe having mixers and burners, the upper portion of said casing extending above said jacket, and the exit of said products of combustion passage and having a series of  
125 air intake ports, and the lower portion of said casing having a series of exit ports communicating with said products of combustion passage, and the upward movement of said products of combustion through said  
130



passage having the effect of siphoning the heated and foul air from the lower portion of said casing and inducing a down draft of pure air within said casing, substantially as described.

3. A gas lamp comprising a jacket, a casing inclosed thereby and spaced therefrom and forming therewith a passage for the products of combustion, burners depending below said casing and having mixers therein, the upper portion of said casing having a series of air intake openings and the lower portion of said casing having exit openings communicating with said products of combustion passage, and a conical deflector arranged below said casing and having an annular flange inclosing said exit openings and extending above the same, for the purpose specified.

4. In a gas lamp, the combination, with a gas supply pipe, of a casing inclosing the same, burners suspended from said pipe and having mixing chambers within said casing, said casing having air intake openings in its upper walls leading to said mixing chambers and exit openings in its lower walls leading from said mixing chambers.

5. A gas lamp comprising a jacket, a casing inclosed thereby and spaced therefrom and forming therewith a passage, burners depending within said jacket, a deck plate closing the lower end of said casing, said casing having air intake openings in its upper walls and exit openings into said passage near said deck plate and a conical deflector interposed between said deck plate and said burners.

6. In a gas lamp, a jacket, a casing inclosed thereby and spaced therefrom, a passage for the products of combustion being formed between said jacket and casing, burners having mixing chambers inclosed by said casing, and a gas pipe communicating therewith, said casing having intake openings in its upper walls and exit openings into said passage in its lower walls, a deck plate below said exit openings and a conical deflector interposed between said deck plate and said burners and adapted to deflect the heat and products of combustion upwardly into said passage.

7. The combination, with a gas supply pipe and the burners suspended therefrom, of a casing inclosing said pipe, and vertically slidable thereon, a conical deflector supported below said pipe and above said burners and having an upwardly extending flange provided with a series of slots, and the lower portion of said casing fitting within said flange and having pins to enter said slots for the purpose specified.

8. In a gas lamp, the combination, with the gas supply pipe, of a jacket, a casing suspended from said pipe within said jacket and spaced therefrom and forming there-

with a passage for the products of combustion, a globe carried by said jacket below said casing, burners depending from said casing within said globe and connected with said pipe, a cone shaped deflector interposed between said burners and said casing, a horizontal deck plate provided above said deflector, a dead air space being formed between said deflector and said deck plate and mixing chambers inclosed by said casing above said deck plate and shielded thereby and by said dead air space from the heat of the burners.

9. A gas lamp comprising a jacket, a casing inclosed thereby, a passage being formed between said jacket and casing for the products of combustion, a gas supply pipe and burners depending therefrom below said casing and having mixed chambers within said casing and said casing having intake openings in its upper walls above the exit opening of said products of combustion passage, substantially as described.

10. In a gas lamp, the combination with a gas supply pipe, of a casing inclosing the same, burners depending from said pipe and having mixing chambers within said casing, a deflector having a dead-air space interposed between said mixing chambers and said burners, and said casing having air intake openings in its upper walls leading to said mixing chambers, substantially as described.

11. In a gas lamp, a jacket, a casing inclosed thereby and spaced therefrom and forming therewith a passage for the products of combustion, burners depending below said casing and having mixing chambers inclosed by said casing, a deck plate arranged below said mixing chambers, a conical deflector interposed between said burners and said deck plate and there being a dead-air space formed between said deflector and said deck plate for the purpose specified.

12. In a gas lamp, the combination, with a gas supply pipe, of a casing inclosing the same, a burner carried by said pipe having a mixing chamber within said casing, a jacket inclosing said casing and spaced therefrom, the passage between said jacket and casing forming an exit for the products of combustion, said casing having an air intake opening in its upper walls leading to said mixing chamber and an exit opening in its lower walls leading from said mixing chamber.

13. In a gas lamp, a jacket, a casing inclosed thereby and spaced therefrom, a supply pipe, a mixer inclosed by said casing, a burner depending below said casing, the upper portion of said casing having an air intake opening and the lower portion of said casing having an exit opening, whereby a circulation of air will be established downwardly within said casing and outwardly



from the lower portion thereof, substantially as described.

14. A gas lamp comprising a jacket, a casing inclosed thereby, an exhaust passage being formed between said jacket and casing, a  
5 gas supply pipe and a burner having a mixing chamber within said casing, said casing having intake openings in its upper walls

above the exit opening of said exhaust passage, substantially as described. 10

In witness whereof, I have hereunto set my hand this 25th day of May 1908.

WILLIAM S. LEVINGS.

Witnesses:

J. A. BYINGTON,

J. H. BALDWIN.