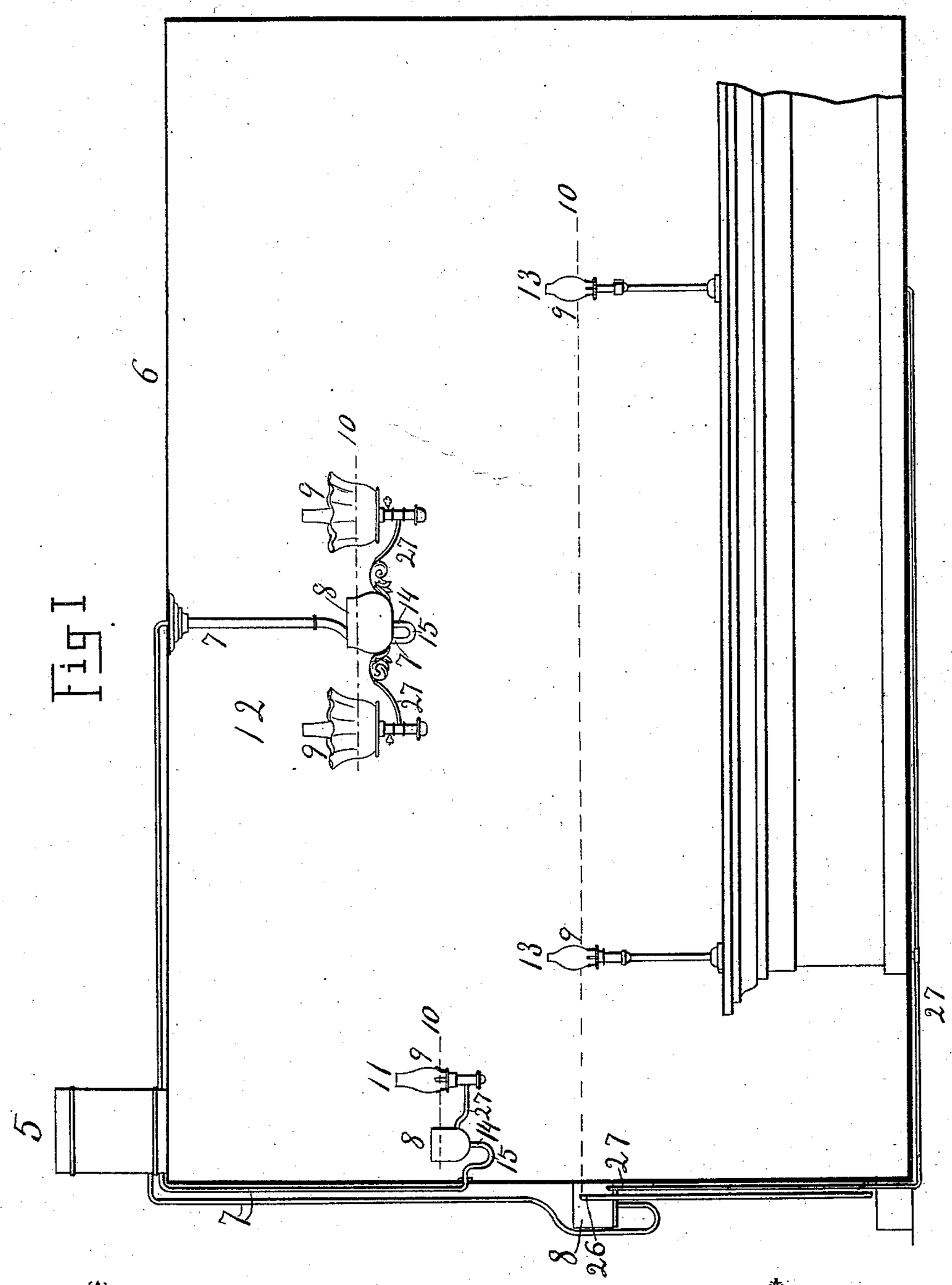
(No Model.) 2 Sheets—Sheet 1.

B. L. LAWTON.

HYDROCARBON LIGHTING SYSTEM.

No. 531,543. Patented Dec. 25, 1894.

Fig 1



WITNESSES,
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M. C. Killyard.

INVENTOR.
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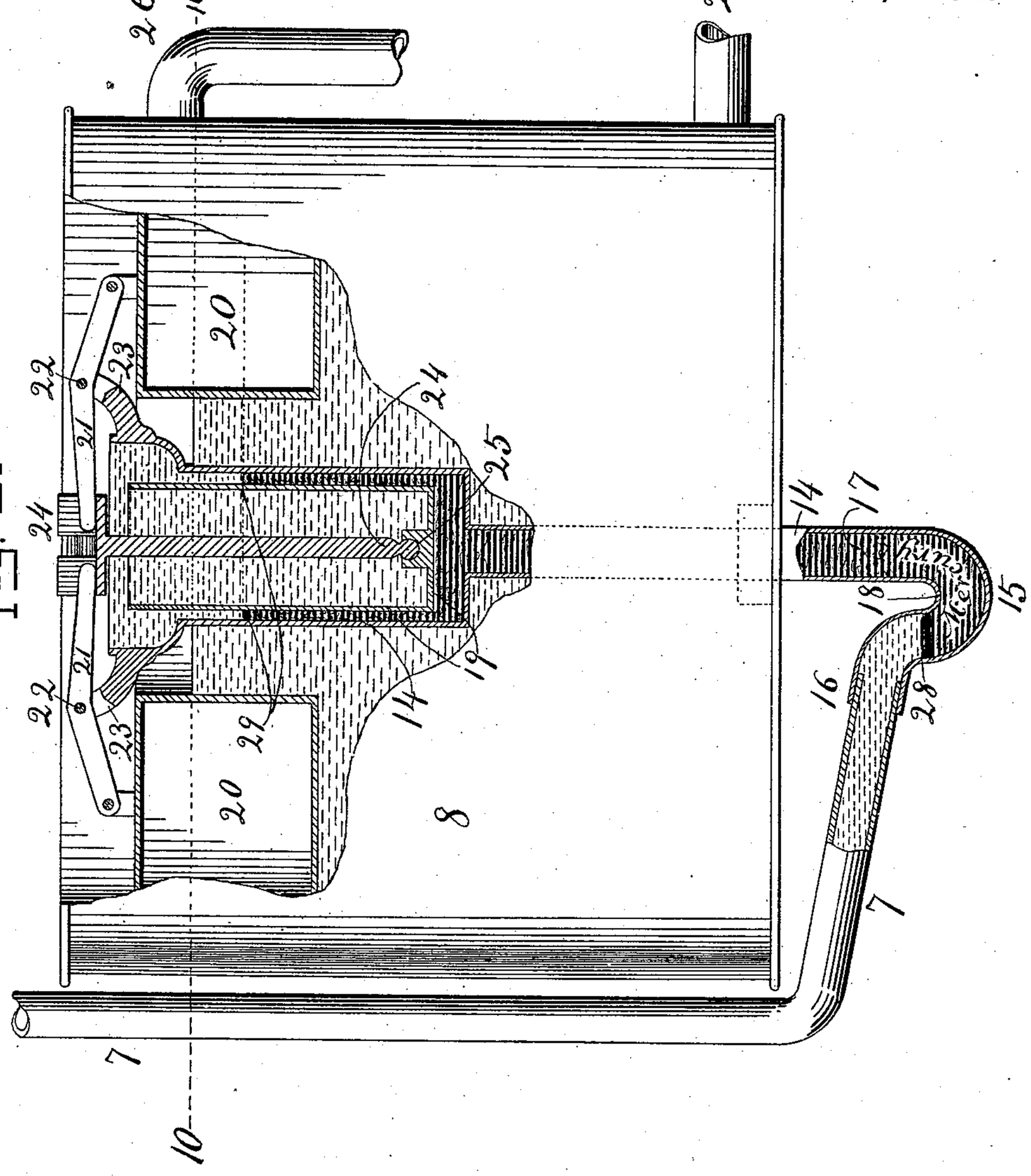
Fig. II.



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UNITED STATES PATENT OFFICE.

BURTON L. LAWTON, OF MERIDEN, CONNECTICUT.

HYDROCARBON-LIGHTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 531,543, dated December 25, 1894.

Application filed November 23, 1893. Serial No. 491,789. (No model.)

To all whom it may concern:

Be it known that I, BURTON L. LAWTON, a citizen of the United States, residing at Meriden, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Hydrocarbon-Lighting Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of lighting systems in which a hydrocarbon of some kind, such as kerosene oil, is held in a reservoir at some convenient point above the level of the burners and connected therewith by distributing-pipes, and its object is to provide means whereby any number of lamps located at different levels may be connected with and safely supplied by a reservoir located on a higher level. The principal obstacle to this method of supplying burners with oil is the tendency of oil to overflow at the lamps and burners by gravity when the reservoir or source of supply is located at a higher level. I overcome this obstacle by interposing between the reservoir and each burner a distributing tank about at the level of the burner, and an automatic liquid valve therefor, as will be hereinafter more fully described.

To this end my invention consists in the construction and combination of parts forming "hydrocarbon lighting systems" hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure I represents a room provided with a hydrocarbon lighting system according to my invention, showing burners in various forms such as hanging chandeliers, bracket and standing lamps, located at different levels. Fig. II represents partly in side elevation and partly in vertical section a distributing tank according to my invention.

5 represents a reservoir which for convenience sake may be located upon the floor 6 above the room in which the burners are located though any other position above the level of the burners would serve the purpose.

7 represents supply pipes running from the reservoir 5 downward to the various distributing tanks 8, which are located each on a level with its respective burners 9.

10 represents the proper levels for the oil in the different burners, and each respective distributing tank 8 is so arranged as to maintain its supply of oil at the same level. While there may be such a distributing tank for each individual lamp, as shown by the bracket lamp 11, yet one tank 8 may supply two or more lamps upon the same level, as in the chandelier 12, or any number of standing lamps 13 might be located at the level 10 of that distributing tank 8, to be supplied thereby.

14 represents a stand pipe located within and extending below each tank 8 and provided at its lower end with a U-shaped trap 15 which makes a short curve and is joined at its opposite end 16 with a supply pipe 7.

17 represents mercury or some similar very dense or heavy liquid in the stand pipe, and the column of the stand pipe is to be proportioned in height to the height of the supply pipe 7 in the same ratio that the specific gravity of mercury, or whatever liquid is used in the place thereof, bears to the specific gravity of the oil or other hydrocarbon in service; that is to say, the stand pipe supplying the lamps 13 of the lower level are proportionately longer than the stand pipe supplying amps at a higher level 12.

The lower end 28 of the column of mercury will rise a little above the apex 18 of the trap on the side of the supply pipe 7 when balancing the oil in the same pipe and when pressed upon by a plunger 19.

The stand pipe 14 is enlarged in its upper portion so that its cross-section is much greater than the cross-section of the same pipe lower down in order that a large plunger 19 may be admitted and yet leave an opening surrounding the plunger about equal to the bore of the stand pipe below.

20 is a float which for convenience sake is made annular to freely surround the upper portion of the stand pipe and rest upon the oil within the tank 8. It is connected with the plunger 19 by means of levers 21, which

are pivoted at 22 to some fixture such as the brackets 23 which are secured to the stand pipe 14, and a pitman 24 which is connected with the plunger 19 by a ball socket joint 25 in the lower end thereof.

26 represents an overflow or discharge pipe for the distributing tank, at the level 10, to prevent the oil from ever rising materially above that level. When a separate tank is provided for each individual lamp, as at 11, this overflow pipe is not necessary, but where a number of lamps are supplied by one distributing tank so that the movement of oil therein is comparatively rapid such a pipe may be necessary to render the action thereof more even.

27 represents a distributing pipe to deliver oil from the distributing tank to a lamp or burner. There may be a number of such pipes connected with one tank, or one pipe leading from the tank may branch off to communicate with a number of burners all upon the same level. After locating the reservoir 5 and the lamps of one level, the distributing tank for that level should be located at the proper height, and the connections should be made between it and the tank, and with the burners.

To adjust the device ready for operation, the plunger 19 and the float 20 should be balanced and held in the required position. Then enough mercury should be poured into the stand-pipe 14 to counterbalance the oil in the supply pipe 7, the lower end of the mercury coming to a level at 28 a little above the level of the apex 18 of the trap 15, and the top of the mercury rising around the plunger 19, as shown at 29. The action would be as follows: When the oil being consumed is gradually drawn out from the distributing tank 8, the float 20 resting thereon, will settle down and the levers 21 and pitman 24 will raise the plunger 19, permitting the mercury at its sides to settle beneath the plunger thus reducing the head or height of mercury below the line 29, and permitting the column of oil in supply pipe 7 to press the lower end of the mercury from its normal level 28 down below the apex 18 of the trap, and then the oil passing this apex will quickly rise like bubbles up through the denser mercury and overflow the stand pipe 14, until the float is raised by the oil of this overflow sufficiently to depress the plunger 19. The mercury is thereby again raised to its normal level, 29 at the top and 28 at the bottom, thus closing the trap and preventing the inlet of oil.

It may thus be seen that the mercury acts as a liquid valve. The stand-pipe 14 and the plunger 19 should be made of or coated with some material which will not amalgamate with the mercury nor be injured thereby. It will now be understood why a longer stand-pipe is required for the lower lamps than for the upper lamps connected with the same reservoir, to wit: in order that the mercury therein may be proportionate to the columns of standing oil in the different supply pipes 7.

Traps have before been used to intercept the passage of gases by the interposition of liquid, such as water filling the passage in the trap and serving as a valve, but in such cases the trap is S-shaped with an upward inlet and a downward outlet and the water stood at an equal level at both sides of the apex of the trap until more water being added at one side of the trap this valve-water in the trap was pushed through and passed out, when the water in the trap again settled to a normal level at both sides, forming a valve to always stop the passage of the lighter fluid such as gas; while in this case the liquid which acts in the valve never passes out, but is merely moved along enough to open the valve and permit the passage of the lighter liquid directly through its standing column. The fluid remaining in the trap was a portion of the fluid passing through it, and of the density. It is evident that the pipe 27 may be so short as to bring the burner almost in contact with the tank 8, so that this tank may be the lamp body for the burner.

Having thus described my invention, what I believe to be new, and desire to secure by Letters Patent, is the following:

1. The combination in a hydrocarbon lighting system, of burners; a reservoir located above the level thereof; a distributing tank at the level of the burners; a supply pipe depending from the reservoir to a point below the level of the said distributing tank; a stand-pipe rising into the distributing tank and enlarged at its upper end and connected at its lower end with the supply pipe by a U-shaped trap; a plunger located within the enlarged end of the stand-pipe and leaving an annular space around it about equal in area to the cross-sectional area of the smaller portion of the stand-pipe; an annular float surrounding the stand-pipe within the distributing tank; a pitman connected with the plunger, and levers each pivoted to a fixture and communicating between the float and pitman and mercury in the stand-pipe, and communicating pipes between the distributing tank and burners, substantially as described.

2. The combination in a hydrocarbon lighting device, of a distributing tank; a supply pipe rising into the same and provided with a mercurial trap; a plunger freely floating in the mercury in the supply pipe; a float in the tank beside the supply pipe; a pitman within the said plunger and connected therewith by a ball and socket joint near the lower end of the plunger; and one or more levers pivoted to a fixture and communicating between the said plunger and float, substantially as described.

3. The combination in a hydrocarbon lighting device of a distributing tank; a supply

pipe rising into the same and provided with a mercurial trap; a plunger freely floating in the mercury in the supply pipe; a float in the tank surrounding the supply pipe; a pitman connected to the interior bottom of the plunger by a ball-and-socket joint and a series of levers located around the pitman and each pivoted at one end to the float; and pivoted midway to a fixture and freely connected at the other end with the said pitman.

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

BURTON L. LAWTON.

Witnesses:
OSCAR O. SCHMELZER,
E. E. SCHMELZER.