3 Sheets—Sheet 1.

D. WHITEFORD.

Lamp.

No. 203,971. **Patented May 21, 1878.**

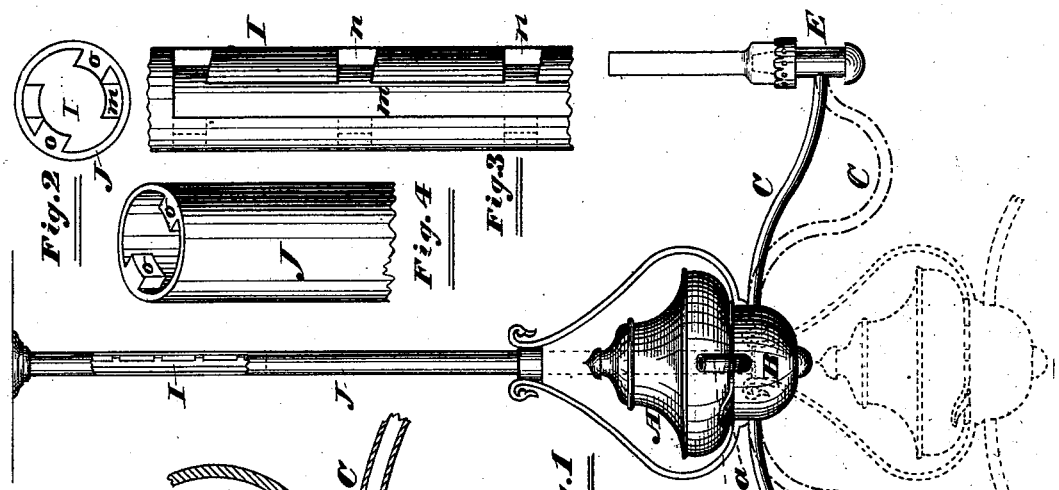

Fig. 1

Fig. 2 Fig. 3 Fig. 4

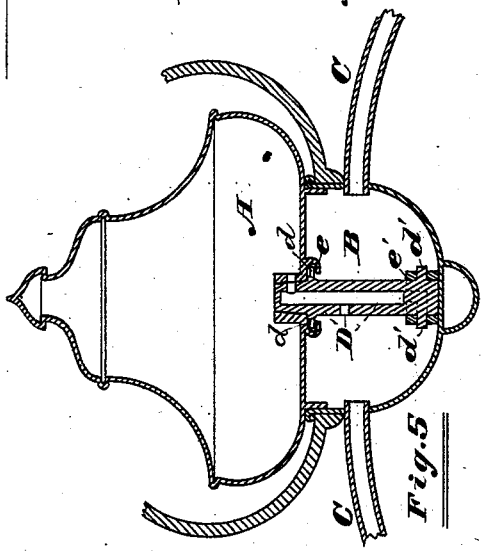

Fig. 5

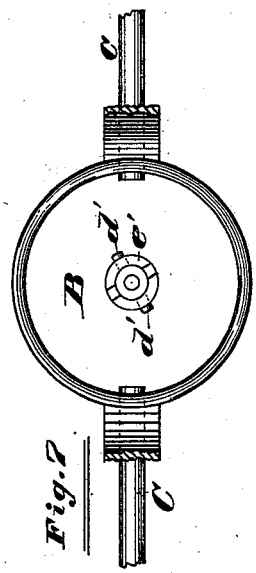

Fig. 7

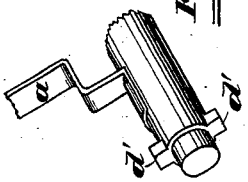

Fig. 8

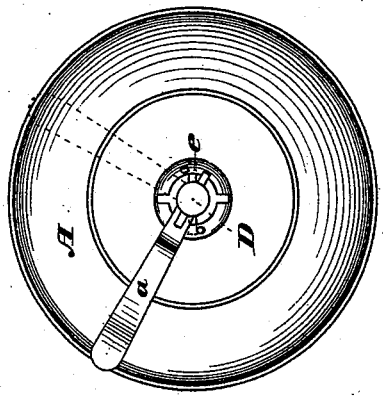

Fig. 6

Fig. 9

Attest:

W. L. Baker

A. R. Ohlman

INVENTOR:

David Whiteford,

By R. L. Dyrenforth,

Attorney.

3 Sheets—Sheet 2.

D. WHITEFORD.

Lamp.

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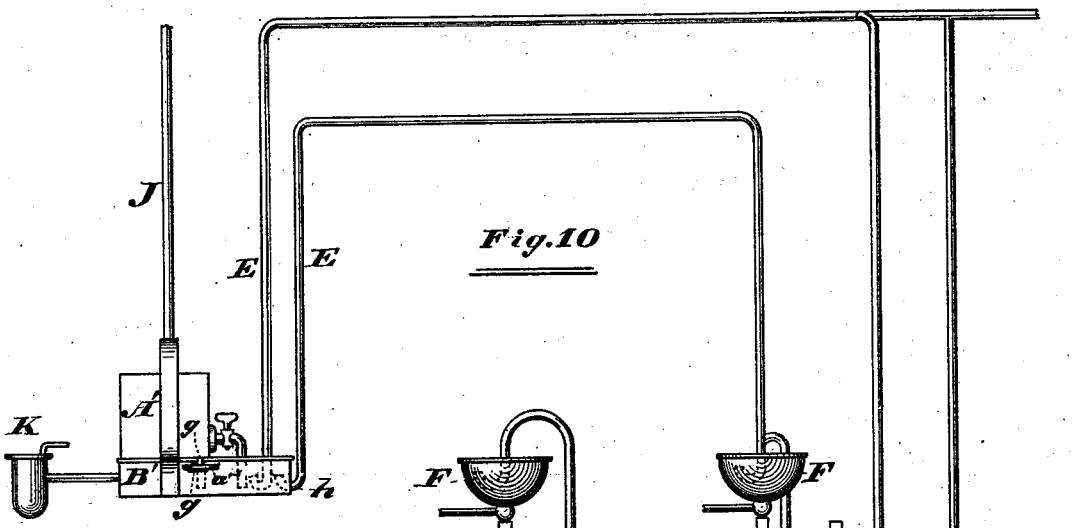

Fig. 10

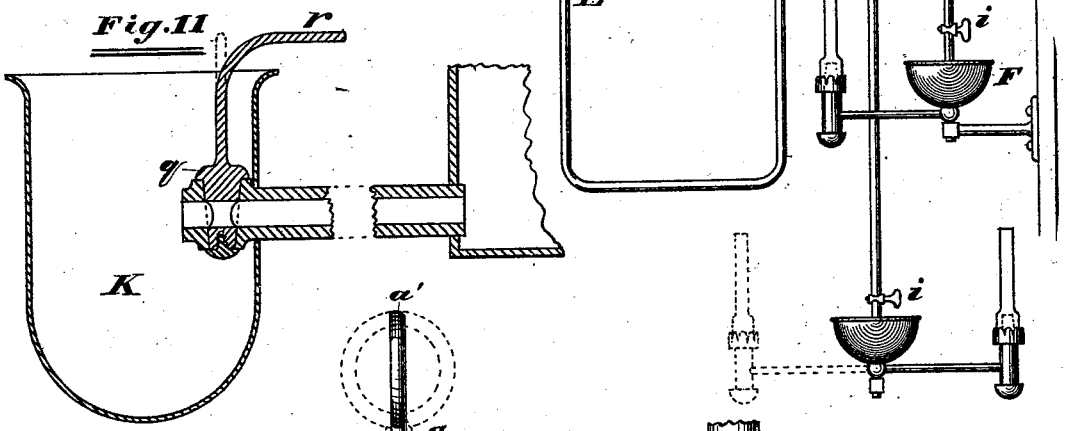

Fig. 11

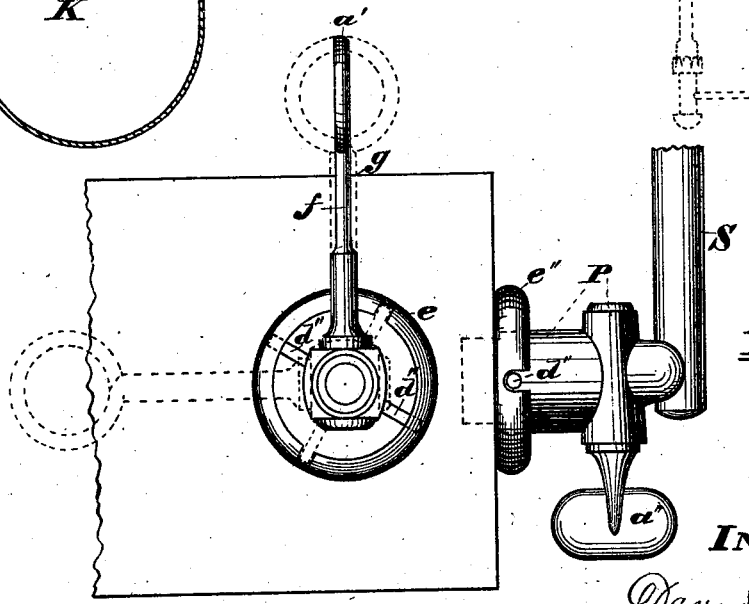

Fig. 12

INVENTOR:

David Whiteford,

By R. C. Dyrenforth,

Attorney.

Attest:

W. L. Baker

A. R. Ohlman

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D. WHITEFORD.

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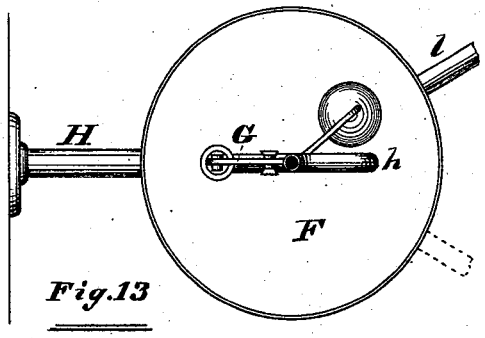

Fig. 13

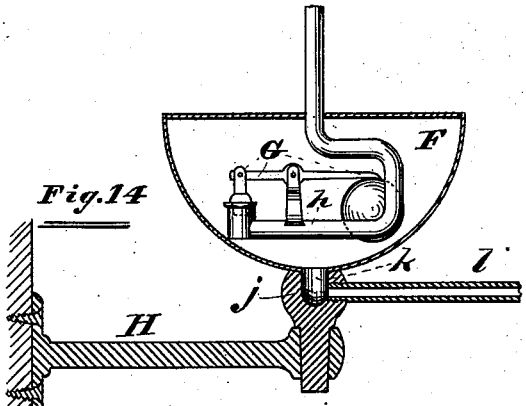

Fig. 14

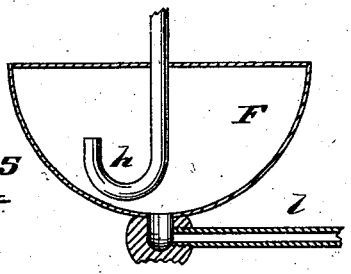

Fig. 15

Attest:

W. L. Baker

A. R. Ohlman

INVENTOR:

David Whiteford,

By P. C. Dyrenforth,

Attorney.

UNITED STATES PATENT OFFICE.

DAVID WHITEFORD, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN LAMPS.

Specification forming part of Letters Patent No. **203,971**, dated May 21, 1878; application filed November 24, 1877.

To all whom it may concern:

Be it known that I, DAVID WHITEFORD, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lamps, together with means for supplying the oil and for controlling the flow; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a chandelier embodying certain of my improvements, and capable of being raised and lowered; Figs. 2, 3, and 4, enlarged detail views of the device by means of which the raising and lowering are effected; Fig. 5, a vertical section, showing the interior construction of the lamp in Fig. 1; Fig. 6, a bottom view of the oil-fount of the lamp in Fig. 1; Fig. 7, a top view of the oil-cup; Figs. 8 and 9, detail views of the cut-off; Fig. 10, the distributing apparatus, showing the siphon devices for conveying the oil from a common reservoir to bracket-lamps at various levels; Fig. 11, an enlarged vertical section of the wick-cup, showing the cut-off for excluding oil from the same, when desired; Fig. 12, two modifications of the cut-off and filling device between the oil-fountain and cup in the lamp, Fig. 1, or between the upper and lower compartments of the oil-reservoir, Fig. 10; Fig. 13, a top view of the bracket-fountain, designed for a level lower than that of the reservoir, and in which the terminus of the siphon is provided with a float-valve to regulate the flow automatically; Fig. 14, a vertical section of the same; Fig. 15, a vertical section of the bracket-fountain and terminus of the supply-siphon, designed for a level equal to that of the reservoir.

My present invention relates chiefly to an amplification of the principles and mechanism involved in my invention in atmospheric lamps, for which Letters Patent of the United States No. 188,199 were granted to me March 27, 1877, and a reissue whereof is now pending, by which amplification or improvement not only may the oil be carried from the fountain to the burners through bent or curved arms, as in that patent provided, but may also, by means of siphon-tubes, be conveyed from a common reservoir, analogous in character and construction to the fountain and cup in my said atmospheric lamp, or from such fountain and cup itself, to an indefinite number of other lamps situated at any desired distance from such source, thus obviating the need of filling at more than one point, the object in using siphon in place of other tubes being both to secure the convenience of having them in the top of a room, as along an upper corner and thence branching downward to the lamps, instead of upon or through the floor and branching upward, and to permit the use of the pivoted bracket-burners, which also constitute an important feature of this invention; and it relates, subordinately, to a device for raising and lowering the reservoir for convenience of filling, and other purposes hereinafter named, or when applied to a chandelier, as in Fig. 1, for graduating the distance of the light as well, all as hereinafter more fully set forth.

In order that my present improvements may be fully and readily understood, a description of some of the features set forth in my previous patent is necessary. This I shall give as briefly as possible, referring to Figs. 1, 5, 6, 7, 8, 9, and 12, some of which figures are simply different forms of device for controlling the flow of oil from the fountain to the burners by way of the cup or intermediate chamber; and all these latter differ more or less from those shown in my said previous patent. The difficulty, then, in using bent or curved arms when connected directly with the sealed fountain is that a trap is formed in the bend or curve, which prevents air from passing into the fountain, and consequently arrests the supply of oil to the burner. To remedy this difficulty, permitting the use of arms of any desired form or configuration, I combine with the fountain A a detachable cup, B, carrying the branching arms C C; or, more strictly speaking, as to the present forms shown, the fountain itself is made detachable from the rest.

Communication between the fountain and the intermediate chamber is controlled by means of a rotary valve or cock, D, having a central passage, and either operated in the manner described in my former patent, or else turned by means of an arm, *a*, projecting out beyond the edge of the fountain. Thus, when the valve is turned to a given degree, the ori-

fices in the valve and seat coincide, and oil flows into the lower chamber or cup through the lower orifice, the flow continuing until the level of the oil in the cup or lower chamber rises above the top of this lower orifice, when it ceases, and the fountain is sealed, and thenceforth oil will flow therefrom only in proportion as it is drawn from the lower chamber B; and, the arms C being attached to the chamber B at points below the lower orifice in the valve D, the oil in the wick-cups E is maintained at very nearly a uniform level. This construction permits the use of arms quite straight, or nearly so, as represented in Fig. 1, or curved or bent to any desired degree, as indicated by the broken lines.

It is obvious that the fountain or upper chamber must be closed air-tight at every part save only at the aperture through which oil escapes into the lower chamber.

My former patent described means for replenishing the fountain from above, the removal of the stopper from the top serving to cut off communication between the fountain and the cup or lower chamber.

The drawings accompanying the present specification show three different devices for effecting substantially the same results with but a single opening, the first of these being the one involving the arm *a*, before referred to, or its equivalent. It operates as follows:

Upon the valve D are four lugs—two, *d d*, near the top, and two others, *d' d'*, near the bottom, in line with the first. At the base of the fountain, and surrounding the valve-seat, is a flanged collar, *e*, slotted on opposite sides to permit the entrance of the lugs *d d*, and at the bottom of the chamber B, upon the inside of the same, is a seat for the base of the valve D, consisting of a second flanged collar, *e'*, with slots on opposite sides for the reception of the lugs *d' d'*. These collars may be of like configuration, though not so shown in the drawing; and they are so secured in their separate positions that when the fountain A is in place the slots in the upper and lower collars will not be vertically in line, as are the lugs, but about one-eighth of a circumference or so from such line, whereby, when the valve is so turned as to bring the lugs *d' d'* into the vertical slots in the lower collar, so that the valve may be disengaged at its base, the upper lugs *d* will still be held by the flange of the upper collar. Moreover, the orifice in the upper part of the valve is directly above one of the lugs *d;* but the orifice in the seat is not in line with either of the slots in the collar, but above a point about midway between the two, measured on the circumference. Thus, when the two orifices coincide, permitting the oil to flow into the chamber B, the fountain A is necessarily firmly attached to the said chamber B; and when the lugs *d'* are (by the turning of the arm *a*) brought into the vertical slots of the lower collar, permitting the removal of the fountain, the valve is necessarily sealed, and the lugs *d* still held by the flange of the upper collar.

Therefore, when it becomes necessary to replenish the fountain, the arm or handle *a* is first turned about one-eighth of the way around, or until it is stopped by the contact of the lugs *d'* with the sides of the slots, or any other stop that may be provided, when the valve is shut and the lugs *d'* disengaged. The fountain A is then lifted off (of course carrying the valve with it) and inverted. The handle *a* is then turned still farther, disengaging the lugs *d* from the flanges of the collar *e* by bringing them into the slots, and the valve withdrawn. After filling the fountain the valve is reinserted, the fountain replaced in position, and communication between the chambers A and B re-established, all by the reversal of the preceding operation.

It will be seen from the foregoing description that this valve device is, in a limited sense, automatic in its operation, for, in order that the lugs *d'* may be brought into the slots, so as to permit the removal of the fountain, the valve is necessarily turned off or shut; and, moreover, the handle *a* cannot be turned sufficiently to allow the valve to be disengaged at the top until it has first been disengaged at the bottom by lifting off the fountain. This avoids all possibility of an escape of oil from the upper chamber at the wrong time.

Similar automatic effects are produced by one of the modifications shown in Fig. 12, as follows: The key or handle *a'* has a flattened shank, *f*. In the edge of the chamber B is a slot, *g*, so narrow at the top as only to admit the shank *f* egdewise, but wide enough below to allow the key to be turned flat, in the manner indicated by the dotted lines. The valve is shut when the flattened part (and likewise the ring) is vertical, and open when it is horizontal. Therefore, when it becomes necessary to replenish the fountain, the ring is first turned to a vertical position, which renders it disengageable, and at the same time shuts the valve. The fountain is then lifted off and inverted as before, the handle swung round until the lugs *d* reach the slots in the collar *e*, as indicated by the second dotted lines, when they may bring up against a suitable stop, the plug withdrawn, the fountain filled, and then the whole operation reversed.

The second form (shown in Fig. 12, and shown also in Fig. 10) is not automatic in its action, but may yet answer sufficiently well for large reservoirs. It is simply a detachable faucet, P, with an elongated spout, S, at the side of the fountain near the bottom. When it becomes necessary to refill, the key *a''* is turned so as to shut off the flow, the fountain removed and turned on its side with the faucet upward, the latter twisted round until the lugs *d''* come into the slots in the collar *e''*, and then the whole withdrawn. It is obvious, however, that, if desired, a slotted guard may be placed over the key in such manner that the fountain can be removed only when the flow is shut off.

Figs. 10, 13, 14, and 15 represent the device

whereby the oil is distributed generally from a single reservoir, by means of siphon-tubes, to any desired number of burners, and also, if necessary, conveyed from one lamp to another; and the purpose of employing these siphons, instead of the ordinary tubes designed simply to carry out the principle of hydrostatic pressure, is, as hereinbefore stated, twofold—first, in order that the said tubes may run along the upper part of the room, out of the way, and, secondly, in order to permit the use of the swinging or pivoted bracket-burners, the construction of which will hereinafter be described.

In these figures, A′ is the supply-fountain, B′ the intermediate chamber, and E E E the siphon. Each siphon may be curved upward, as shown, at the end which dips into the chamber B′, and also at the opposite end, where it dips into a bracket-cup, either on the same level with the chamber B′ or on a lower level. These bends or curves form traps *h h*, which serve to prevent the admission of air to the pipes after it has once been exhausted and the oil passed through, even though the level of the oil in the chamber B′ or the bracket-cup fall below the mouth of the tube.

I do not, however, limit myself to the siphons formed with these traps. If desired, such a trap may be employed at only one instead of at both ends; or the traps may be wholly dispensed with without departing from the spirit of my invention.

When the siphon supplies a cup, F, at a level below that of the chamber B′ it becomes necessary to employ the self-acting float-valve G, in order to cut off the flow when the oil has reached a certain level. When desired, the flow may be excluded absolutely from the lower bracket-cups F by means of the cocks *i i*, This would be done to prevent loss by evap. oration where the lamps are not in frequent use.

In order that the bracket-burner may be swung from side to side it is constructed as follows: The stem *j* of the cup F is hollow for a short distance down, forming a recess, *k*, which the oil enters through a hole in the bottom of the cup, flowing to the wick-cup through the pipe *l*. The stem *j* is pivoted vertically into the bracket-arm H, so that the pipe *l* may be readily turned from side to side, the cup F turning freely with it. It will be seen that this could not be accomplished without the the employment of siphon-tubes of some form or other, (except where the fountain is immediately above the cup, operating as in Fig. 1,) since it is necessary that the supply-pipe enter the cup F from above and be wholly disconnected from it.

The raising and lowering device serves several purposes, as will hereinafter be explained, and is constructed as follows: I is a shaft, having two longitudinal grooves, *m*, on opposite sides, and short branch recesses *n n*, inclining slightly downward from the grooves *m*, on corresponding sides of the same. These recessses may be formed as close together as desired along the length of the shaft I, and are, of course, formed only along one side of each groove *m*.

J is a sleeve, within which the shaft I slides; and *o o* are lugs on its inner surface, adapted to slide in the grooves *m* and enter the recesses *n*. Thus the fountain may be readily raised or lowered to any desired level, it being for this purpose only necessary slightly to lift and turn it, so as to bring the lugs out of the recesses *n* and into the grooves *m*, slide it up or down, as requirement shall dictate, and then turn it back, bringing the lugs into other recesses.

Not only does this arrangement afford facilities for filling, (and, when applied to a chandelier, also for graduating the distance of the light,) but it also affords a simple and spontaneous means for graduating the height of the oil in those cups F which are on an equal level with the chamber B′ of the reservoir; for it is obvious that the surface of the oil in these cups must always be in the same plane with the surface of that in the chamber B′, wherefore, (the cups F and the siphons being fixed,) if the reservoir is lowered and raised within certain narrow limits, the oil will correspondingly rise and fall in the cups F. This is turned to valuable account in the way of limited loss by evaporation, by having the termini of the siphons sit low in the cups, and, when not in use, lowering the reservoir by means of the device above described, when the oil in each cup must, of course, recede to a level with the mouth of the trap, when a trap is employed. Thus, if not used for a considerable time, the quantity so lost is limited and ascertained.

It may, in some cases, become desirable to have other lamps supplied by means of a siphon from a hanging lamp, such as is represented in Fig. 1, or to have such a lamp without a fountain, itself supplied by means of a siphon leading from a reservoir, while yet, in either event, preserving its capability of being raised and lowered. This may readily be accomplished as follows: If the lamp is without a fountain of its own, and is to be supplied from elsewhere, (when it is analogous to the bracket-lamps already described,) the supply-pipe may extend down the side of the sliding device, terminating at a point where it will dip into the cup when the latter is at its highest level, and provided, as in the case of those which enter the lower bracket-cups, with a cock. Before lowering the lamp the cock is turned off, thus stopping the flow, and as soon as the supply in the cup shows signs of failing, the whole may be raised, replenished, and again lowered. Substantially the same idea is carried out in the first case named above, viz., where the lamp is itself the reservoir; but here the end of the siphon, instead of entering the cup from the top direct, enters through a spout, *p*, projecting from the side of the cup. The fountain-lamp being lowered,

the supply is, of course, here cut off from the branch lamps; but at proper intervals they may be simultaneously replenished by raising the fountain-lamp for a brief period to the requisite level.

It often becomes desirable to cut off the supply from the wick-cups K separately. For this purpose I employ the cock *q*, in the end of the supply-pipe, and operated by means of the handle *r*, Fig. 11, whereby the drip, if there be any, falls within the cup instead of upon the floor.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an atmospheric lamp or oil-reservoir, the device for preventing the flow of oil from the fountain to the intermediate chamber or cup during the process of filling, and also for holding the said fountain and cup together when communication has been established between them, consisting of a connecting-valve operated by a key, handle, or any equivalent means, and detachable from both the fountain and cup, but not from both simultaneously, and detachable from the cup, moreover, only when, by the turning of the said key or other agent, the valve has been shut and the flow stopped, and from the fountain only after it has been lifted away from the cup, substantially as specified.

2. The combination consisting of the valve D, provided with the lugs *d d* and *d′ d′*, slotted and flanged collars *e* and *e′*, and handle *a*, constructed and arranged to operate substantially as described, for the purpose set forth.

3. The oil-distributing device consisting of the combination of the following elements, viz: the upper chamber A′, lower chamber B′, the said two chambers communicating in the manner described, and siphon-tubes E, leading from the said lower chamber B′ to cups F, substantially as set forth and shown.

4. In combination with the upper chamber A′ and lower chamber B′, communicating in the manner described, the siphon-tubes E, provided, when conveying oil to cups F at a lower level than the chamber B′, each with a float-valve, G, adapted automatically to prevent the rising of the oil above a given height within such cups F, substantially as described.

5. The combination of an upper chamber, A′, and lower chamber B′, communicating as described, and siphon-tubes E, leading from said lower chamber to cups F, and provided at their extremities with traps *h*, substantially as described, for the purpose set forth.

6. An atmospheric bracket-lamp, in which the intermediate chamber or cup turns on a hinge or pivot, whereby the burner may be swung from side to side, as set forth.

7. The bracket device, consisting of the cup F, having the partly-hollow stem *j*, the latter pivoted to the fixed arm H, in combination with the tube *l*, whereby the burner may be turned or moved from side to side, substantially as described.

8. The device consisting of the sleeve J, provided on its inner surface with the lugs *o o*, in combination with the shaft I, having the longitudinal grooves *m* and branch recesses *n*, constructed and arranged to operate substantially as described, by means of which the reservoir is raised and lowered and the height of the oil within the cups F regulated, as set forth.

DAVID WHITEFORD.

In presence of—
JOHN H. BYRNE,
JOHN A. STEEN.