W. A. BUTLER.

FOUNTAIN LAMP.

No. 188,584. Patented March 20, 1877.

Fig. 1

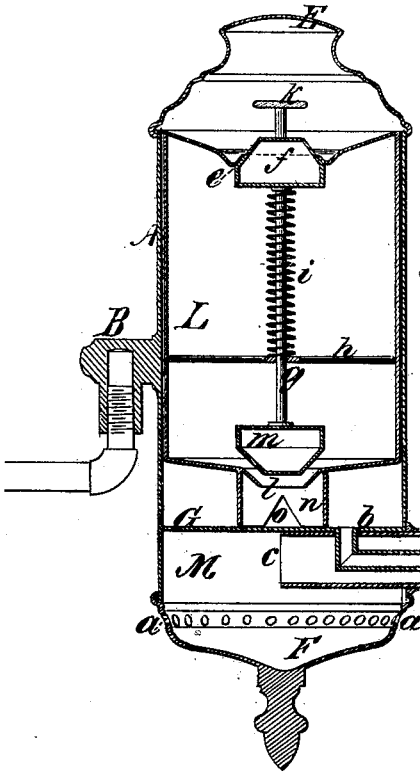


Fig. 4

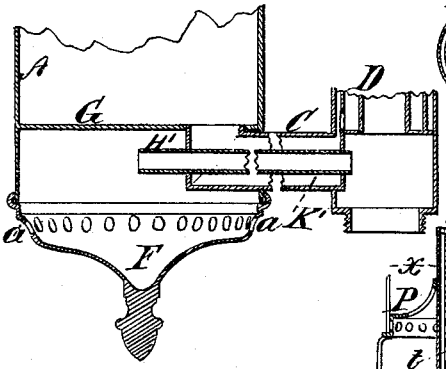


Fig. 2

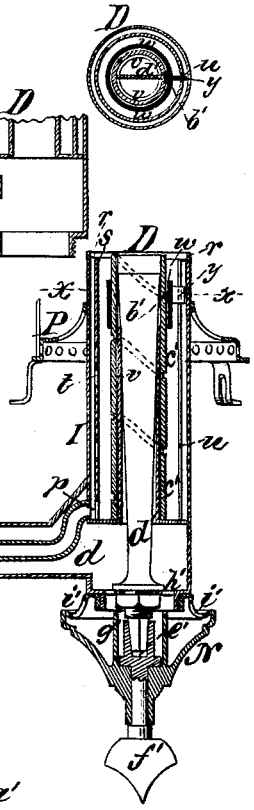


Fig. 3

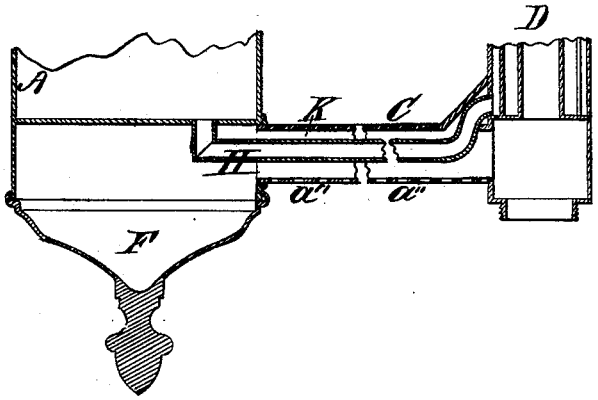
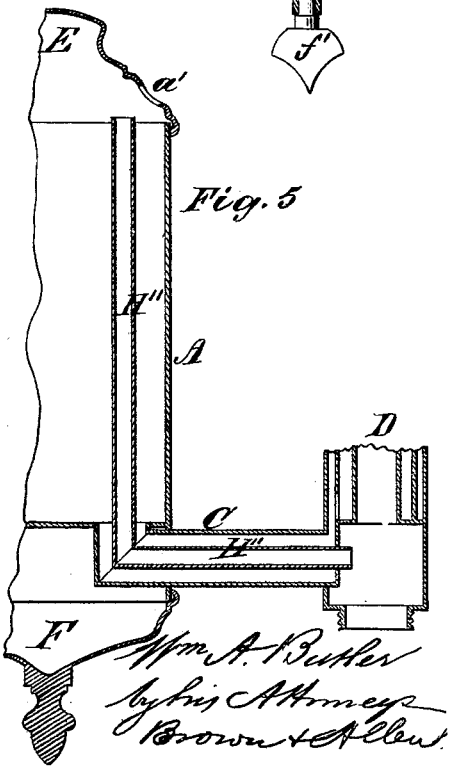


Fig. 5



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WILLIAM A. BUTLER, OF NEW YORK, N. Y.

IMPROVEMENT IN FOUNTAIN-LAMPS.

Specification forming part of Letters Patent No. **188,584**, dated March 20, 1877; application filed January 22, 1877.

To all whom it may concern:

Be it known that I, WILLIAM A. BUTLER, of the city, county, and State of New York, have invented certain Improvements in Fountain-Lamps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification.

My invention more particularly relates to that class of fountain-lamps called student-lamps; but it is applicable to all kinds of lamps, chandeliers, lanterns, or other illuminating apparatus employing the fountain-lamp principle for the supply of oil to an Argand burner.

My invention consists partly in a combination, with the oil-chamber of a fountain-lamp, of valves and valvular openings for filling such oil-chamber, and for allowing the oil to flow to the lamp-burner, such valves being so arranged and actuated together by a spring, that, when the valve which closes the opening through which oil is supplied to the oil-chamber in filling the same is opened by the pressure of the thumb, the valve which permits the feeding to the burner is closed; and, when the pressure of the thumb is removed, the spring closes the valvular opening through which the filling has been performed, and opens that valve which permits the feeding.

The invention further consists in a novel construction of the burner, whereby the wick in said burner is raised or lowered without turning said wick around the vertical axis of the burner, whereby oil overflowing the wick-tube is carried back into said burner.

The invention also consists in an auxiliary draft-tube passed through the supporting-arm that leads from the case of the oil-chamber to, and which supports, the burner, said arm also containing a passage for oil from the reservoir to said burner.

Figure 1 in the accompanying drawing is a central vertical section through a fountain-lamp comprising my improvements. Fig. 2 is a horizontal transverse section through the burner on the line *x x*. Figs. 3, 4, and 5, represent modified ways of carrying out that part of my invention relating to the auxiliary draft-tube passing through the supporting-arm which leads from the case of the oil-chamber to, and supports, the burner.

A represents the case of the oil-chamber, and B the attachment which joins said case to a standard or support. C is a tubular supporting-arm uniting the case A and the burner D.

The case A has a removable cap, E, and, in certain ways of carrying out my invention, it has a perforated bottom F, the perforations in said bottom being indicated at *a*, Fig. 1. In certain other modifications the cap E is perforated as shown at *a'*, Fig. 5.

A horizontal partition, G, is soldered to the interior of the case A, near the bottom thereof. In one way of carrying out my invention the oil tube or passage H, Fig. 1, which supplies oil to the wick of the lamp, passes through the partition G at *b*, and thence passes through the central part of the tubular supporting-arm C to the wick-tube I of the burner, as shown in Fig. 1.

In this modification of the invention the tubular supporting-arm C passes through the wall of the case A, below the partition G, and that extremity of said tubular arm in the space between the partition G and the bottom F of the said case is left open, as shown at *c*. The other end of said tubular supporting-arm opens into the central part of the burner, as shown at *d*, Fig. 1, the annular space K, surrounding the oil tube or passage H, forming an auxiliary draft-tube or air-passage, which, in use, operates as hereinafter set forth.

L is a removable oil-chamber fitted into the case A. At the top of said chamber is a valvular opening, *e*, which, except while filling, is closed by the valve *f*. Said valve *f* has a stem, *g*, which plays through a hole in the cross-bar or guide *h*, said valve being held closed by a spring, *i*, interposed between said cross-bar and said valve *f*; but this precise arrangement of the spring is not material to my invention, as the said valve may be closed, and held closed, by any suitable spring, arranged in any suitable manner. The said valve *f* is supplied with a thumb-piece, *k*, at the top, pressure on which opens said valve.

In the bottom of the oil-chamber L is

another valvular opening, *l*, provided with a valve, *m*, the valve *m* being attached to the stem *g*, said stem being common to both the valves *f* and *m*. The valvular opening *l* is surrounded by a notched tube, *n*, which rests upon the partition G, and supports the oil-chamber L in the case A.

Both the valves *f* and *m* are made of sheet metal by spinning the valve over the seats, which causes the valves to accurately fit their said seats, forming part of the valvular openings *e* and *l*.

The oil-chamber, when required to be filled, may be taken out of the case A and held in one hand, a finger or thumb of the same hand pressing upon the thumb-piece *k*, which opens the valve *f* and closes the valve *m*. The oil is then poured into the said oil-chamber through the valvular opening *e*. The said chamber is then replaced in the case A, and the pressure removed from the valve *f*. The spring *i* then tightly closes the valve *f*, at the same time opening the valve *m*; but the said chamber is preferably filled while in the case A. The oil then feeds down from the chamber L into the space M, air passing into said chamber through the notch *o* in the notched tube *n*, until the oil rises sufficiently in the said space M to cover said notch *o*, when the external pressure of the atmosphere prevents the further flow of oil from the chamber till the oil is drawn off by the action of the wick below the upper part of the said notch *o*, when more oil feeds down, and so on till the chamber L is emptied of oil.

In the modification of my invention, hereinbefore described, the oil passes from the space M to the burner, through the tube or passage H, and enters the burner at *p*, Fig. 1.

Said burner is attached to the end of the tubular supporting-arm C, and is partly composed of an outer shell, I, joined to an interior shell, *s*, said shell *s* being perforated at *t*, and vertically slotted at *u*, said perforations and slot distributing the oil entering from the tube H to all parts of the wick. The vertical slot *u* also performs another function, hereinafter described. Said burner is further composed of an inner tube, *v*. The annular spaces between the shells I and *s*, and between the shell *s* and inner tube *v*, are closed at the bottom. The inner tube *v* is open at the bottom. The wick-carrier *w* runs in the annular space between the shell *s* and the tube *v*. It is provided with an exterior projection, *y*, which slides in the vertical slot *u* in the shell *s*, and with an interior projection or screw-thread, *b'*, which fits a thread of abrupt pitch on the tubular screw or wick feeder *c'*, which also plays in the annular space between the shell *s* and the inner tube *v*. Said tubular screw or wick feeder *c'* rises somewhat above the inner tube *v*. To the inside of said tubular screw, at the upper end, is attached a rod or, preferably, a flat thin bar, *d'*, which descends through the inner tube *v*, a portion of said bar extending down into the drip-cup N. That end of said rod *d'* which extends down into the drip-cup N is fitted to a socket, *e'*, formed in the upper end of a key, *f'*, said key being inserted through and pivoted to the bottom of said drip-cup. Around that part of said key which is inside of the drip-cup is placed a short tube, *g'*, said tube being soldered to the bottom of the drip-cup, which prevents leakage through the bottom of said drip-cup a ound said key. To the bottom of the inner tube *v* is soldered a cross-bar, *h'*, having formed therein a hole or bearing fitting a bearing formed on the said rod or bar *d'*. A nut screwed onto the said rod *d'* below said cross-bar *h'* bears against said cross-bar, and holds the rod or bar *d'*, and its attached wick-feeder *c'*, from rising when operated as hereinafter described.

The drip-cup N is screwed onto the bottom of the burner in the usual manner, and is provided with the usual draft-holes *i'*.

It is evident that turning the key *f'* to the right or left will cause the wick-carrier *w* to rise or descend, said wick-carrier being held from turning on its vertical axis by its exterior projection *y* working in the vertical slot *u*, its interior projection or screw-thread *b'* working in the thread of the tubular screw or wick-feeder *c'*. The wick is attached to the wick-carrier in the usual manner, or in any other suitable way.

But I do not confine myself to the precise construction and arrangement of the key *f'* for working said wick-feeder *c'* through the rod or bar *d'*, as said rod or bar and the attached wick-feeder may be turned by different appliances, such as a horizontal shaft and intervening bevel-gears.

An air-distributing chimney-base, P, is attached to the burner in the usual way.

The operation of the lamp as thus far described is as follows: The oil feeds to the wick, and the height of the wick is adjusted by the wick-carrier, tubular screw, and its attached rod or bar *d'*, and the key *f'*, as hereinbefore described. Air is supplied to the outside of the flame through the perforations of the air-distributing chimney-base P, and to the inside of the flame through perforations in the drip-cup N and the inner tube *v*.

But in addition to the air thus supplied a much more perfect draft is secured by the auxiliary draft tube or passage K through the supporting-arm C, air entering this passage through the perforated bottom F of the oil-chamber case A, and being conducted by said passage to and delivered to the central part of the burner below the inner tube *v*, through which it rises to the interior of the flame.

By this means I so perfect the draft as to greatly increase the illumination obtained in an Argand lamp by a given consumption of oil.

But the said auxiliary draft may be obtained through the said supporting-arm in various ways besides that already described.

The bottom F may be imperforate, and per-

forations a'', for admission of air, may be formed in the tubular supporting-arm, as shown in Fig. 3.

The oil may flow to the burner through the annular space K', Fig. 4, while air passes through the central tube H', as shown in the same figure, the air entering through perforations *a* in the bottom F of the case A.

Or the air may enter the top E of the case A, and pass through the tube H'', as shown in Fig. 5, the oil passing, in this case, through the annular space between said tube and the sides of the tubular supporting-arm C. In this case the bottom F of the said case A is not perforated, but the cover E is perforated, as at *a'*.

The said bottom F of the case A may be removable, if desired.

I prefer to make the rod or bar *d'*, which connects the key *f'* with the wick-feeder, thin and flat, to form a vertical septum, dividing the interior of the inner tube *v* of the burner as nearly as possible into two equal spaces, as shown in Figs. 1 and 2, as I find by experiment that this acts favorably upon the flame of the lamp—probably by preventing a whirling motion of the air in said tube caused by junction of the horizontal air-current issuing from the tubular supporting-arm and the vertically-ascending air-current from the drip-cup.

By the construction described I secure greater convenience in filling the oil-chamber, as I avoid the necessity of inverting said chamber while filling, and I avoid the disagreeable dripping of oil when filling and replacing the oil-chamber by use of the valve *m* in the bottom of said chamber. By the auxiliary draft-passage through the supporting-arm I increase the illuminating power of the flame. By my improved construction of the burner I obtain greater convenience in adjusting the wick, and secure the general appearance of an Argand gas-burner. By removing the entrances for air from each other as I do, by the employment of an air-passage through the supporting-arm, I maintain the draft in spite of any interference by sharp external air-currents over either of the sets of air-entrances so removed from each other.

I prefer to make an opening or openings, *r*, at the top of the burner, over the annular space between the shells or tubes I and *s*, to permit the superfluous oil carried up by the wick when said wick is moved upward to run back into the burner through the said annular space, instead of running down over the outside of the shell I into the drip-cup N, thus greatly increasing the cleanliness of the lamp.

I claim—

1. The combination, with the oil-chamber L, having valvular openings *e* and *l* in its top and bottom, of the valves *f* and *m*, connected by a valve-stem, and a spring, *i*, to close the upper and open the lower valve, substantially as and for the purpose described.

2. The auxiliary draft-passage through the supporting-arm C, substantially as and for the purpose set forth.

3. The combination, with the wick-feeder or tubular screw *c'* and the wick-carrier *w*, of the rod or bar *d'*, extending downward through the inner tube *v* of the burner, for turning said wick-feeder *c'*, substantially as and for the purpose described.

4. In an Argand burner, the tubes I and *s*, made with an opening or openings between their upper ends to allow oil to run back into the burner through the annular space between said tubes when the wick is raised, substantially as and for the purpose set forth.

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Witnesses:

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