(No Model.) 2 Sheets—Sheet 1.

E. BEACH.

ARGAND LAMP BURNER.

No. 381,099. Patented Apr. 17, 1888.

Fig. 1.

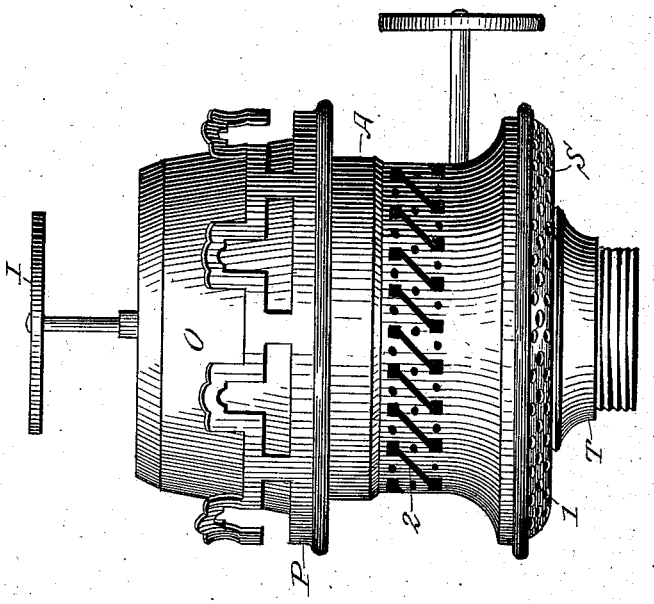
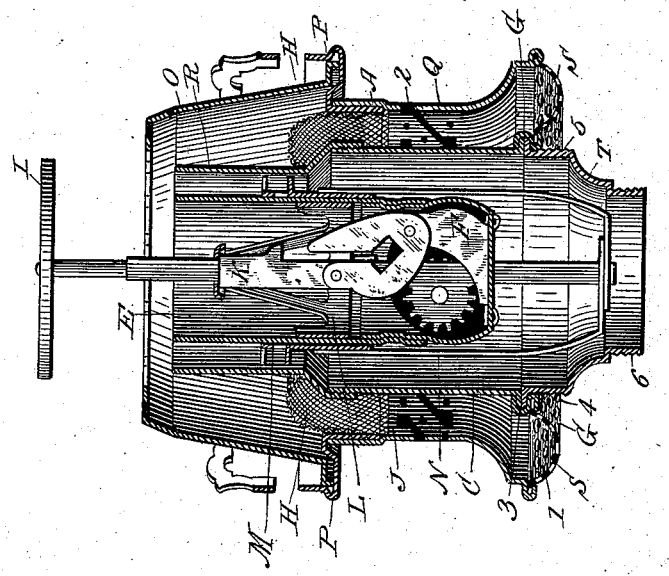


Fig. 2.



Witnesses:
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Tom K. Stuart

Inventor:
Elias Beach.
By Marble & Macon,
Atty.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

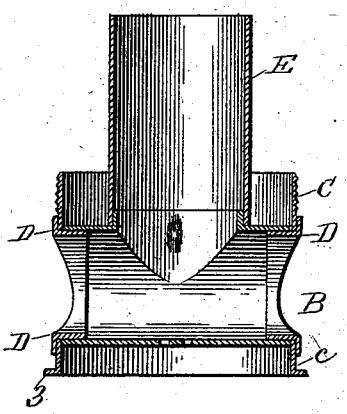


Fig. 4.

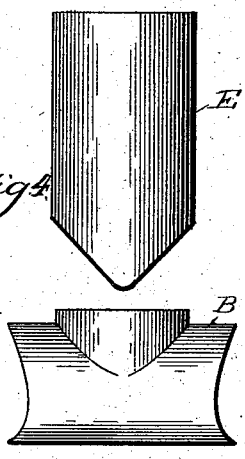


Fig. 5.

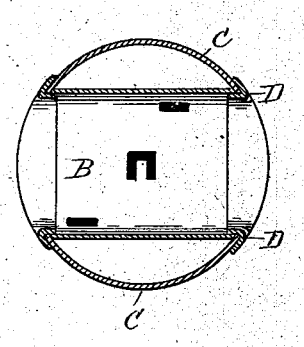


Fig. 6.

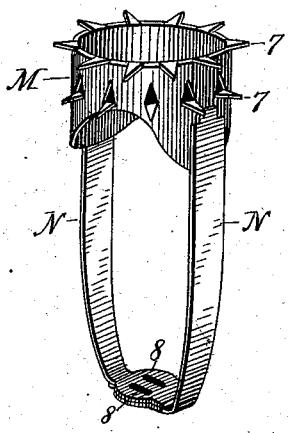


Fig. 7.

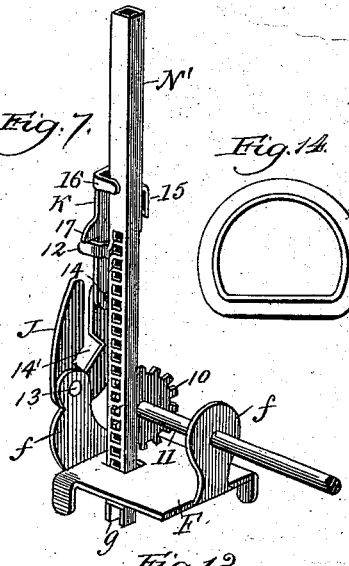


Fig. 14.

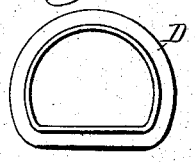


Fig. 8.

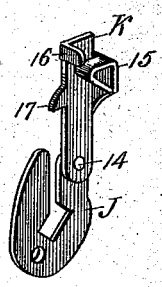


Fig. 9.

Fig. 12.

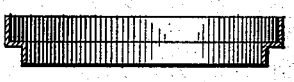


Fig. 10.

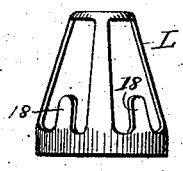


Fig. 11.

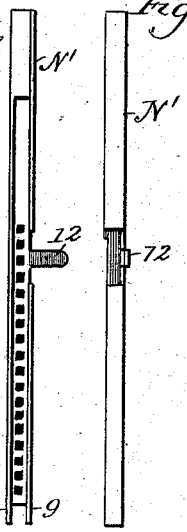
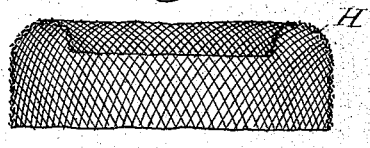


Fig. 13.



Witnesses:
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Jno. R. Stuart.

Inventor:
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By Marblet Mason
Atty's.

UNITED STATES PATENT OFFICE.

ELIAS BEACH, OF CHICAGO, ILLINOIS.

ARGAND LAMP-BURNER.

SPECIFICATION forming part of Letters Patent No. 381,099, dated April 17, 1888.

Application filed April 9, 1887. Serial No. 234,216. (No model.)

To all whom it may concern:

Be it known that I, ELIAS BEACH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Argand Lamp-Burners; 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.

My invention relates to Argand oil-burners; and it consists in the construction and combination of parts, which will be fully hereinafter described and claimed.

One object of my invention is to provide an Argand burner in which the currents of air passing therethrough are graduated according to the requirements of the burner, and to separate and equalize the currents supplying the different parts thereof, and so unite them at the point of combustion as to produce perfect and uniform combustion.

A further object of my invention is to provide an Argand burner wherein the parts are united without the use of solder or brazing, and which are simple and effective in their construction and operation and readily adjusted, as may be desired or necessary.

I attain these objects by the mechanism illustrated in the accompanying drawings, wherein the same letters and figures of reference indicate the same or corresponding parts, and in which—

Figure 1 is an elevation of my improved oil-burner. Fig. 2 is a vertical section of the same. Fig. 3 is a vertical section of the central vertical and horizontal draft-tubes and their connections, together with the tube-holder. Fig. 4 is a side elevation of the central vertical and horizontal draft-tubes, shown detached from each other. Fig. 5 is a horizontal section of the tube-holder, the horizontal tube, and the connecting-thimbles, showing the perforations in the bottom surface of the horizontal tube for the mounting and operation of the rack mechanism. Fig. 6 is a detail view, in perspective, of the wick-engaging ring and its connections. Fig. 7 is a detail view, in perspective, of the rack mechanism, the operating-shaft, the spur-wheel, the supporting-frame, and the connections, the rack being shown at its highest point of elevation. Fig. 8 is a detail view, in perspective, of the slotted crank and toggle-lever. Fig. 9 is a detail top plan view of the locking-ring before being pressed around the parts to be locked together thereby. Fig. 10 is a detail view, in elevation, of the conical spider or guide for holding the rack. Fig. 11 is a front elevation of the rack-bar, showing the opening in its face and the pin which engages with the crank and toggle-lever. Fig. 12 is a side elevation of said rack-bar. Fig. 13 is a cross-sectional view of the wire gauze or netting. Fig. 14 is a plan view of the connecting-thimble.

A represents the outer shell of the burner, which is attached to the bottom support, S, by beading and pressing the parts together to form a rigid connection, which will prevent any movement of the mechanism placed in position therein. The said outside shell and bottom support are perforated, as at 1 and 2, Figs. 1 and 2, to admit the necessary amount of air to the different parts of the burner. On the top portion of the outside shell, A, the gallery P is mounted, and constructed and arranged to support the cone O and the chimney. The lower portion of the gallery P is provided with flanges formed at such angles as to allow it to be inserted inside of and rest upon the top portion of the outside shell, A. The outer lower edge of the said gallery extends some distance away from the shell, is constructed with a bead, which is adapted to hold the tripod for supporting the globe or shade, and the upper part of the said gallery is provided with spring-arms for holding or securing the chimney.

The connection of the gallery to the outside shell is such that it can be readily removed at will, thus removing the globe, chimney, and cone O at one and the same time, so as to allow the lighting, trimming, or rewicking of the burner.

Mounted within the shell A is the central vertical tube, E, around which the wick or wicks are placed, and connected to the bottom portion of this tube E is a horizontal tube, B. Around these tubes E and B a cylindrical tube-holder, C, is placed, having openings in its sides which engage with the open ends of the horizontal tube B, as fully illustrated in section in Fig. 3. Thimbles D are inserted in the openings in the sides of the tube-holder C

and in the open ends of the tube B, the form of the openings and the thimbles being such that when the said thimbles are pressed into place and locked by suitable means tight joints between said parts are secured, and thus they are held in a fixed position. The bottom of the tube-holder C is constructed with an outwardly-projecting flange, 3, which rests on a flange, 4, formed on the top portion of the male joint T, and when said flanges have been thus arranged they are united by a locking-ring, G, which is pressed around or over and under the same, and also under the inwardly-curved portion of the support S, thus firmly securing said parts together and to the support of the burner entire. The male joint T is constructed with two threaded portions, 5 and 6, situated at parts of said joint varying in diameter, the larger part, 5, being connected with what is known in the art as a "mammoth collar," and the smaller part, 6, with an ordinary No. 2 collar; or said joint can be made to fit a mammoth collar, and by attaching an expander, in lieu of a No. 2 collar, can be adjusted for attachment to the collar of an ordinary lamp.

The outer surface of the upper portion of the outside vertical tube-holder, C, is provided with screw-threads, by which connection is made with the lower enlarged screw-threaded end of the removable tube R, which is of such diametric cross-section relatively to the vertical tube E as to hold the wick-raiser and the said vertical tube E in proper position. Around the removable tube R a wire-gauze safety-netting, H, is placed, through which the air supplied to the outside of the flame is filtered, and thus the light is made less sensitive to the currents of air, and also the flame is prevented from communicating with the lower portion of the burner, to which it might be drawn by the leakage of gas or oil through the connecting joints. This netting H extends down into and below that portion of the gallery P which is inserted in the top of the outside shell, A, and has its lower portion secured to said shell, so that the removal of the gallery will not disturb or displace the netting.

The central vertical tube, E, is encircled by a wick-raising ring or support, M, Figs. 1 and 6, which is constructed in the form of a short tube, the lower edge thereof being of such configuration as to conform to and rest upon the top of the horizontal tube B. The upper part of said ring M is provided with two rows of projecting teeth, 7 7, formed integrally therewith, which engage with the wick or wicks and raise them, as will be more fully hereinafter described.

Upon the sides of the ring M, at points diametrically opposite each other, the upper ends of two flexible arms, N N, are secured; thence they extend downwardly past the horizontal tube B, their lower ends being bent at an angle and overlapped, thus forming a securing base or bracket. Two apertures, 8 8, are cut in the lower overlapped ends of said arms, through which two projections, 9 9, formed at the lower end of the rack-bar N′, pass and are clinched, thus securing the said arms N together at their lower ends, and forming a rigid connection between the wick-raising collar or ring M and the said rack-bar.

As shown in Figs. 7 and 11, the rack-bar N′ is constructed in square tubular form, a portion of one side thereof being left open for the reception of the spur-wheel 10, which is mounted on the end of a small horizontal shaft, 11, supported by and having bearing in one of the upright arms *f* of a bracket, F, which is secured in the horizontal tube B and by the outside shell, A. To another arm, *f*′, of the bracket F a crank, J, is hinged by means of the pivot-pin 13 passing therethrough, the upper end of the crank J being in like manner hinged to a toggle-lever, K, by means of a pivot-pin, 14.

The rack-bar N′ has a projection, 12, formed on one side thereof, which engages with a recess, 14′, constructed in the crank J, and operates in the manner hereinafter set forth. The toggle-lever K is provided with an arm, 15, bent into the shape illustrated in Fig. 8, which projects into the opening in one side of the rack-bar N′. Upon this bent arm the shank of the button or spreader I rests, said shank passing down through the upper open end of the rack-bar, and being raised or lowered by said bent arm. On the opposite side of the lever K another arm, 16, is provided, which passes over and close to the rack-bar N′, by which and the arm 15 said bar is steadied in its movements. Below the arms 15 and 16 of the lever K, and near the arm 16, a lug or projecting shoulder, 17, is formed, with which the projection or pin 12 on the rack-bar N′ engages as said bar is raised, which has the effect of limiting the further upward movement of the said rack-bar. The rack-bar is further steadied in its movement by passing up through the bottom of the horizontal tube B and the central vertical tube, E, and is held in proper position by the devices situated in the horizontal tube B, as above described, and by its passage through the angular opening in said tube.

In the upper internal portion of the vertical tube E, and resting on top of the horizontal tube B, a conical spider, L, is mounted and secured, and through the top rim thereof the rack-bar N′ passes and is supported in its vertical movements. The lower continuous rim of this spider L rests on the horizontal tube B, and is provided with projections 18, which engage with the vertical tube E and keep the said spider in a central upright position. The conical shape of the spider allows an unobstructed working of the crank J, and toggle-lever K inside of the projections thereof is less liable to be effected by the heat, and avoids the downward passage of the flame.

The cone O, which has a base-rest on the gal-

lery P and surrounds the upper part of the burner, is constructed with a flat surface at its top edge, which is provided with a series of apertures, as shown by dotted lines in Fig. 1. These apertures divide the air drawn to this part of the flame and produce a white and steady light, whereas if the current were allowed to escape through the large central opening of the cone an unsteady, flickering light would be produced, due to the velocity of the current acting on the flame direct.

To wick the burner, the gallery P, cone O, tube R, and wire-netting H are removed, as hereinbefore described, and the wick engaging ring M raised to its highest elevation. A wick is then forced down into the open space between the tube-holder C and the horizontal tube B until it can be reached from the lower part of the burner, when it is drawn downward the required distance. The corresponding wick for the other side is then introduced in a similar manner. After slightly lowering the wick-engaging ring, the sides of the two wicks are then brought together slightly around the vertical tube E and the said wick-engaging ring M, the teeth 7 7 on the latter being pressed through the wicks to hold them in position until the removable tube R is secured to the tube-holder C. The wicks are then ready for lighting. It will be seen that when the two wicks are thus engaged by the wick-raiser or ring M and held in position by the removable tube R the wicks are virtually continuous and act as a single round wick, and that the raising and lowering thereof must be absolutely true and even. The lower row of teeth on the wick-raiser takes off any strain upon the top portion of the wicks which might be caused by friction on the tubes and avoids the cramping of the same in passing the horizontal tube B and their contraction in entering the collar of an ordinary lamp. After the wicking is completed, the flat metallic deflector or spreader I is placed upon the burner. The wire stem or shank thereof, being inserted in the opening in the top of the rack-bar N', drops down therethrough, and rests on top of the bent arm 15 of the toggle-lever K, which enters and has movement in the open side of the said rack-bar, as stated.

When the rack-bar N' is raised and lowered by the spur-wheel 10 and its connections, the wick-raising ring M is moved in like manner, and also the projecting pin 12 on the said bar is consequently raised and lowered and engages the slot in the hinged crank J in its descent. When said bar and wick are moved downward, the pin 12 descends until it reaches the bottom of the slot in the crank J, and as the slot is formed near the pivotal point of the said crank a further movement of the pin 12 causes the crank and the toggle-lever K, hinged to the long arm of the crank, to move or revolve from the vertical position shown in Fig. 7 and the toggle-lever and its arm 15 to descend. As the arm 15 of the toggle-lever K descends, the support of the stem or shank also descends, the said stem lowering in the hollow rack-bar N' until the combustion space at the upper portion of the burner is covered thereby, thus extinguishing the light and preventing any escape of gas or smoke or evaporation of oil through the wick-tubes so long as the deflector is allowed to remain in a closed position. A slight movement of the rack-bar N' upward raises the crank and toggle-lever to an upright position, and as the wick and deflector are also raised the burner is again ready to be relighted. When the crank and toggle-lever are raised, they are held in their elevated position by the projecting pin 12 of the rack bearing against the shoulders 17 on the upper end of the toggle-lever K.

The relative movement of the parts is such that on turning the ratchet-wheel to raise the wick the pin 12 acts at once upon the crank J and gives a sudden upward movement to the spreader, which reaches its elevated position before the wick-raiser is fully elevated, although the motion of both commences at the same time. The wick-raiser will also descend first until the pin 12 reaches the inclined portion of the slot in the crank J, when a positive downward movement will be given to the spreader, which then also becomes the extinguisher. It will thus be apparent that the action of the spreader is positive and accomplished by one spur-wheel, as is also that of the wick-raiser.

The provision of perfect draft will be readily understood. A part of the air which enters the perforations in the outer shell, A, passes through the horizontal and vertical draft-tubes B and E and rises inside of the circular wick to the flame. A part of the air also passes outside of these tubes and the wick and into the cone O, and escapes partly through the central opening in the cone, and partly through the circular row of perforations in the upper edge of said cone. This latter part of the air impinges on the flame just at the edge of the spreader I, and the united currents tend to produce a perfect combustion and a steady intense white light.

It will be readily seen that, owing to the construction and operation of this combined mechanism, the use of springs or other devices liable to get out of order or be injured by the heat is entirely dispensed with.

It is obvious that minor changes may be made in the construction and arrangement of the parts without in the least departing from the nature or principle of my invention.

Having thus described my invention, what I claim as new is—

1. In an oil-burner for lamps, the combination of a perforated outer shell, a removable tube, a tube-holder formed with openings in its sides, vertical and horizontal draft-tubes, and thimbles connecting the horizontal draft-tube to the tube-holder, substantially as described.

2. The combination, in an Argand burner, of the vertical tube E, the conical spider L, having a continuous rim and projections at the bottom, the horizontal tube B, the bracket F, the crank J, toggle-lever K, rack-bar N′, and the spur-wheel 10, substantially as described.

3. The combination, in an Argand burner, of a rack-bar constructed with a projection or pin, a slotted crank, a toggle-lever hinged thereto and having a lug resting on said pin, and means for operating the said parts, substantially as described.

4. The combination, in an Argand burner, of the cone, the spreader having a downwardly-extending shank, the tubular rack-bar having an open top, an open side, and a projecting pin, and devices for operating said bar, substantially as described.

5. In an Argand burner, the combination of the cone, the spreader, the toggle-lever K, the crank J, the rack-bar N′, and means for operating the latter, substantially as described.

6. In an Argand burner, the combination of the male joint T, the support S, the outside shell, A, the tube-holder, and the lock-ring G, for uniting the said parts, substantially as described.

7. The combination, in an Argand burner, of a wick-engaging ring, the rack-bar connected to said wick-engaging ring, a shaft provided with a spur-wheel engaging said rack, the central air-tubes, a deflector or spreader connected with said rack-bar, a crank hinged within the central air-tubes, and a toggle-lever hinged to the crank and having an arm extending into the open side of the rack-bar and forming a support for the spreader, the rack-bar and crank being provided the one with a projecting pin and the other with a recess engaging the same, substantially as described.

8. The combination, in an Argand burner, of a deflector or spreader, a conical spider, the vertical tube, the rack-bar provided with a projecting pin, a shaft and spur-wheel, a toggle-lever having a bent arm extending into the rack-bar and a stop or shoulder formed upon the opposite side thereof, a slotted crank, and a supporting-bracket, substantially as described.

9. The combination, in an Argand burner, of a vertical tube, E, the deflector I, the spider L, the rack-bar N′, provided with the projection or pin, the slotted crank J, the toggle-lever K, hinged to said crank, the spur-wheel, and the operating-shaft, substantially as described.

10. The combination, in an Argand burner, of the wick-raiser, the movable tubular rack-bar having the projection, the slotted crank J, the toggle-lever K, the conical spider L, and the deflector I, the slot in the crank and the construction of the toggle-lever allowing the required travel of the rack-bar, substantially as described.

11. The combination, in an Argand burner, of the wick-raising ring having flexible arms, the deflector, the rack-bar having the pin, the slotted crank, the toggle-lever hinged to said crank, the bracket to which the crank is hinged, and means for moving said rack-bar, substantially as described.

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

ELIAS BEACH.

Witnesses:
EDWARD J. WOODWARD.
CHAS. S. CLARKE.