J. N. COFFIN.

Lamp Burner.

No. 16,825. Patented March 17, 1857.

Fig: 1.

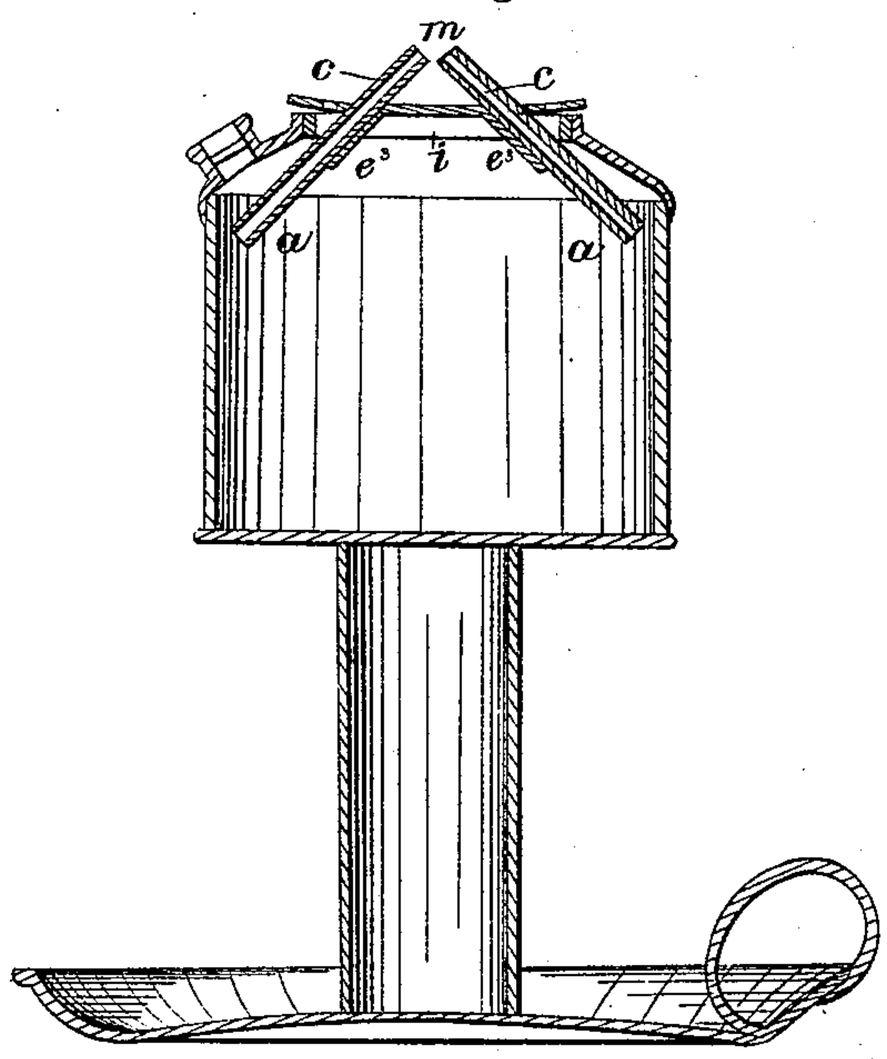
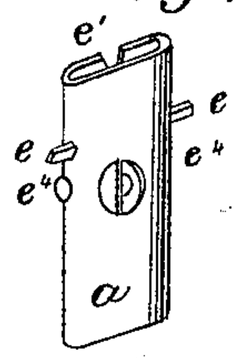


Fig: 2.



UNITED STATES PATENT OFFICE.

ISAAC N. COFFIN, OF WASHINGTON, DISTRICT OF COLUMBIA.

LARD-LAMP.

Specification forming part of Letters Patent No. 16,825, dated March 17, 1857; Reissued March 16, 1858, No. 537.

To all whom it may concern:

Be it known that I, ISAAC N. COFFIN, of Washington, in the District of Columbia, have invented a new and useful Improvement in Lard-Lamps; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same.

The nature of my invention consists in an improvement in lard lamps constituted by the combination of two flat inclined wick tubes with a concave reflector formed on the top of the lamp reservoir, which reflector by throwing the heat back on the inner sides of the tubes, on the wicks, on the air which ascends between the wick tubes, on the lard on the wicks, on the vapor of the lard, and on the flame, and also by heating the air by reflecting heat on the tubes against which the air impinges in its ascent between them and rubs in its attempts to rise vertically, increases the heat in all of these and thereby effectually volatilizes lard, a very viscid substance and very difficult to volatilize, to the high degree necessary to form pure flame purified from smoke, burns the smoke, increases the size and of course radiating surface of the flame, and gives more light, and by the additional heat thus thrown enables my lamp to omit all the usual devices in lard lamps called "heaters" and omit all the usual devices in lard lamps for raising lard up to the wick, where it can be melted or kept melted, such as pistons, screws, &c.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

I construct for the cap of my lamp a concave reflector, attaching the lower side to the ordinary screw of the lamp cap. This concave reflector I combine with two flat wick tubes, by placing the flat wick tubes through the concave reflector at right angles to each other at such a distance apart from each other that when inclined toward each other and fixed in position their upper ends are three sixteenths of an inch apart.

Figure 1, in the accompanying drawings, exhibits the structure of this improvement and combination of the two flat inclined wick tubes with the concave reflector, in which *a*, *a*, are the two flat wick tubes inclined toward each other at right angles; *i*, the concave reflector; *m*, the space between the upper ends of the wick tubes; *c*, *c*, under sides of the tubes *a*, *a*, between their upper ends and the concave reflector. Fig. 2, exhibits a perspective view of one of the wick tubes detached.

The wick tubes are loose in the concave reflector and can be readily withdrawn from the lamp for filling, cleaning, &c. The wick tubes are provided with small projections or lugs *e*, *e*, by which they are checked and held in place, the lugs resting on the concave reflector. The wick tubes have a slit from top to bottom (*e'*) and an opening (e^2) the more freely to admit the lard to the wick. In order to preserve the inclination and position of the wick tubes they are supported by strips or wings of metal e^3, e^3, attached firmly to the under side of the cap and inclined to each other at the same angle with the tubes, viz. a right angle. The little projections e^4, e^4, on the edges of the wick tubes aid in preventing the wick tubes from being drawn upward when picking up the wick. It will be seen that from the position of the concave reflector relatively to the tubes that the heat radiated from the flame on the concave reflector will be reflected back on the under sides *c*, *c*, of the flat inclined wick tubes, that the heat will be reflected on the wicks, on the lard which boils up in foam on the wicks, on the air which ascends between the wick tubes, on the vapor of the lard, and on the flame. By this combination of the concave reflector and the two inclined flat wick tubes as above described the atmospheric air which enters between the two wick tubes above the concave reflector, whose tendency after entering is to ascend in a perpendicular direction, is pressed (by the pressure of the atmosphere at the two sides) against the hot inner sides of the tubes in its attempts to rise vertically, at the pressure of at least 14 pounds on the square inch. By this pressure and abrasion of the air against the hot inner sides of the two tubes it is constantly acquiring in the minutest steps of its ascension greater and greater heat by pressing against hotter and hotter portions of both of the tubes, till at last it is wire-drawn between the hot sides of the upper ends of the two tubes, and through both flames, receiving a fire from both sides of the battery of flame, and at same time from the concave reflector battery below, and the volume of air and vapor being thin the heat thrown from each side

combined with that which is reflected from below pervades every particle and molecule of it, raising it to a very intense heat. By the action of this concave reflector in imparting heat to the air in its ascent it brings the powerful aid to the heat of the flame of this intensely heated air to conjointly with the hot upper ends of the two tubes, and their flames, act on the vapor of the lard and causes the combustion to become very thorough and the minutest particle of carbon in the vapor is reduced to its constituent molecules in the form of gas. Also a supply of hot oxygen (that which forms a portion of the atmospheric air) is afforded to it, which enters into the most intimate possible combination with the carbureted hydrogen. From these actions a very intense combustion and heat is produced, which heat reacts on the wicktubes, (inclusive of the combined action of the concave reflector in throwing heat on them,) which convey sufficient heat to the lard in the reservoir of the lamp to continue the fusion of the lard. Lard being a very viscid substance requires a strong heat and heated air to burn it without smoke, and both of these by the combination of the concave reflector with the two inclined flat wick tubes, all above described, I am enabled to give it, thereby reducing all the vapor and all the smoke to combustible gas. By this combination of the concave reflector with the two flat inclined wicktubes I am enabled in the construction of my lard lamp entirely to omit a heating wire or strip of metal called a "heater," so common in lard lamps, the objections to which are, that it materially obstructs the supply of air, and the shadow cast by it, and its refrigerating effect upon the flame, render lard lamps useless, and also am enabled entirely to omit all devices, such as pistons, screws, &c., for raising the lard to the wick, the objections to which are that the complications of such contrivances and their liability to get out of order render lard lamps too expensive. I am enabled by this combination to burn lard in cold weather with success.

To operate or use this lamp, I melt a little lard in a cup or other convenient vessel by setting it on the fire or holding it over the flame of a lamp and pour it in on that which is cold and at the same time set the lamp down by the fire for a short time to fuse that which is on the wick and in the tubes.

I hereby disclaim the arrangement of flat inclined wick tubes at right angles to each other that having been done by H. W. Revely, but claim—

The combination of the flat inclined wick tubes at right angles to each other with the concave reflector as above described for the purposes above mentioned.

ISAAC N. COFFIN.

Witnesses:
Z. K. Offut,
T. C. Donn.

[First printed 1912.]