H. E. RIDER.

MANTLE BURNER FOR KEROSENE LAMPS.

APPLICATION FILED JUNE 27, 1910.

1,021,163. **Patented Mar. 26, 1912.**

Fig. 1.

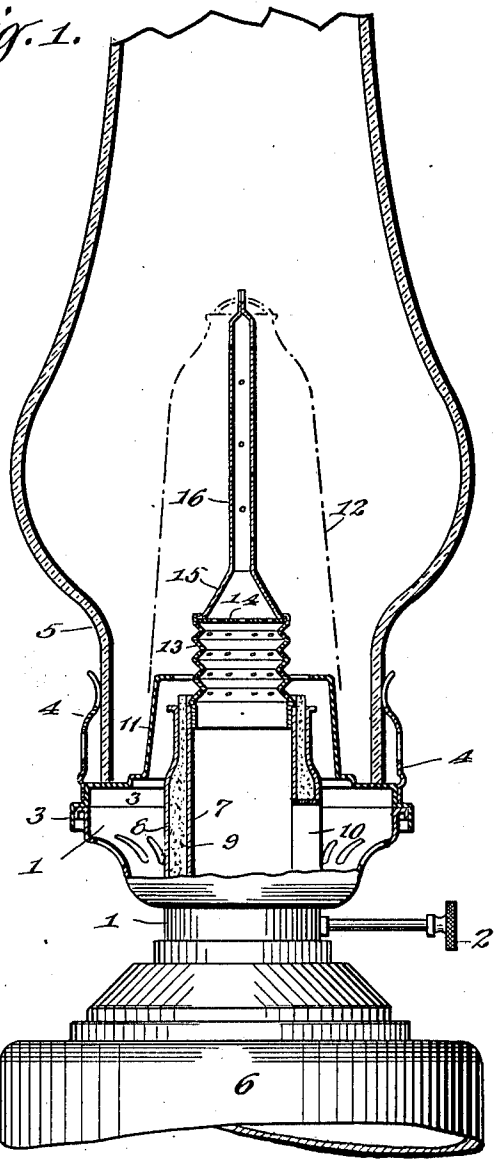


Fig. 2.

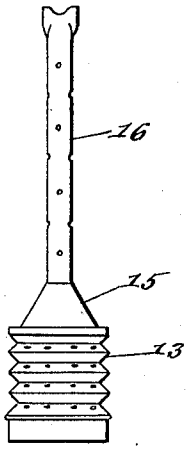


Fig. 3.

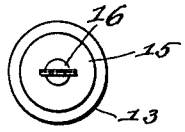
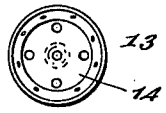


Fig. 4.



WITNESSES

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MANTLE-BURNER FOR KEROSENE-LAMPS.

1,021,163. Specification of Letters Patent. Patented Mar. 26, 1912.

Application filed June 27, 1910. Serial No. 568,986.

To all whom it may concern:

Be it known that I, HERBERT E. RIDER, a citizen of the United States of America, residing in the borough of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Mantle-Burners for Kerosene-Lamps, of which the following is a specification, reference being had therein to the accompanying drawings, forming part thereof.

My invention relates to mantle burners for kerosene lamps and the general object of my invention is to secure better combustion of the vaporized oil and thereby to obtain a brighter light and to avoid the blackening of the mantle by carbon deposits which result from imperfect combustion.

More particular objects of my invention are to create a freer draft of air and to so direct and distribute the air as to form a more thorough mixture with the vaporized or gasified fuel.

Burners of the type to which my invention belongs have proved faulty because of insufficient air supply at the proper points to effectively burn the vapor generated, resulting in imperfect combustion and the consequent formation of carbon deposits on the mantle.

My invention includes an improved air distributer for the inner wick tube.

My invention more particularly includes an annularly corrugated or circumferentially ribbed burner cap having perforations at the bottom of the corrugations, that is to say, at the depressions between the ribs or at the bottoms of the grooves formed by the corrugations, the upper walls of such grooves being imperforate, whereby the air flowing upwardly through the inner wick tube is deflected outwardly into the vapor generated in the upper portions of the wick and flowing upward from the upper end thereof.

My invention also includes in combination a perforated air-distributing or air-supplying tube carried by and extending upward from the top of the burner cap, so that air is effectively supplied at the interior of the intermediate and upper portions of the mantle to there mix with the unconsumed vapor at these points.

My invention also includes an air-preheating chamber at the top of the burner cap and with which the lower end of the air-distributing tube connects.

My invention also includes other advantageous features and several details of construction and combinations of parts, as will hereinafter appear.

I shall now describe my invention with reference to the accompanying drawings and shall thereafter point out my invention in claims.

Figure 1 is a partial central vertical section of a lamp embodying my improved burner, portions being omitted. Fig. 2 is an elevation of the air distributer removed from the burner and rotated on a vertical axis one-fourth turn from the position shown in Fig. 1. Fig. 3 is a plan view of the air distributer. Fig. 4 is an inverted plan view of the same.

My invention is shown in the drawings as embodied in a burner having a lower part or base 1 provided with wick adjusting means as indicated by the handle 2 and having air-inlet openings as shown; and an upper part 3, shown as fitting over the base 1 and provided with usual spring chimney supports 4 for holding in place a chimney 5, the burner being shown as applied to an ordinary lamp font 6. The burner is provided with usual inner and outer wick tubes 7 and 8, respectively, carried by the base 1, and with a wick 9 between these tubes. The inner wick tube 7 is provided with a lateral air inlet 10 extending through both wick tubes at the side, as shown in Fig. 1, and air entering through the inlet 10 passes upward inside the inner wick tube 7 to the inside of the circular flame. The upper end of the outer wick tube is provided with the usual radial flange as shown, which protects the base of the flame from too strong a draft such as might extinguish the flame. A gallery 11 surrounds the outer wick tube 8 and extends above the upper end of the outer wick tube and is provided at its top with an inwardly turned flange overlying the flange of the outer wick tube 8, such gallery flange serving to direct the air inward toward the flame. The gallery 11 is shown as formed integral at its base with the upper part 3 of the burner. A mantle 12 is supported above

the gallery 11 and inner and outer wick tubes 7 and 8.

The parts of the device so far described are of usual construction, and such construction may of course be varied to a greater or less extent and still be coöperative with the improvements introduced by my present invention.

The device as so far described is not complete by reason of the fact that no means have as yet been described for distributing the air passing upward to the flame through the inner wick tube 7, and it is to such means, in combination with other parts of the device, that my present invention is chiefly directed. The air distributer for thus distributing the draft of air supplied through the inner wick tube includes a burner cap which fits into and projects upwardly from the upper end of the inner wick tube and serves as an air distributer and preheater for air supplied to the inside of the circular flame. This burner cap is shown as including a sheet metal cylinder 13. Above the inner wick tube 7 the cylinder 13 is provided with a series of transverse annular corrugations having perforations at the inner or depressed portions of the corrugations. These perforations are shown as located immediately below the upwardly and outwardly flaring or sloping imperforate air deflecting surfaces formed by the corrugations and at the upper edges of the downwardly sloping surfaces which join such imperforate air deflecting surfaces. By reason of this relative arrangement of imperforate air deflecting surfaces and perforations or air outlets the air passing outward through these outlets is deflected upwardly into and becomes intimately mixed and intermingled with the vaporized fuel flowing upward from the upper end of the wick 9, thereby greatly facilitating combustion. At the outside of the cylinder 13 the above described corrugations form V-shaped grooves with the perforations at a substantial distance inward from the mouths of the grooves and substantially at the bottoms of the grooves. The outer diameter of the cylinder 13 is substantially the same as the inner diameter of the inner wick tube 7. The corrugated and perforated burner cap 13 effectively distributes air to the inside of the circular flame within the lower portions of the mantle 12.

The means for distributing air within the intermediate and upper portions of the mantle include a perforated disk 14 forming a closure or top for the upper end of the cylinder 13; an imperforate conical wall 15, tapering upward from the upper end of the cylinder 13 and forming an air preheating chamber above the top 14; and a perforated air distributing tube 16 closed at its upper end and shown as having its lower open end integrally connected with the upper reduced end of the upwardly tapering wall 15, and projecting upwardly therefrom to the upper end of the mantle 12, of which it forms the support. The upper end of the tube 16 is shown as closed by having the sides pressed together, and the flattened portion thus formed is notched, as shown, to form a mantle support. The air distributing tube 16 is of considerably smaller diameter than the cylinder 13 and is disposed in concentric relation therewith. The air which escapes from the air outlets or perforations in the air distributing tube 16 mixes with the gases and vapors within the upper portions of the mantle 12 and serves as an additional or auxiliary air supply for effectively burning any unconsumed vapor found at this location.

The number and size of the perforations in the cylinder 13, forming the sides of the burner cap, and in the disk 14 forming the top of the burner cap, and in the sides of the air distributing tube 16, are relatively so proportioned as to effect the proper distribution of air to the desired points, that is to say, so that the entire supply of air entering the inner wick tube 7 through the air inlet 10 is distributed proportionately and to the best advantage.

The corrugated surfaces of the cylinder 13, besides deflecting and directing the air draft, are very effective in preheating the air, both because of the larger surfaces exposed and because of the fact that the air issuing through the perforations in the cylinder 13 is brought into intimate contact with the upwardly sloping and outwardly flaring imperforate air deflecting surfaces. The air supplied to the air distributing tube 16 is effectively preheated in the preheating chamber formed by the conical wall 15 and the disk 14.

It is obvious that various modifications may be made in the construction shown and above particularly described within the principle and scope of my invention.

I claim:

1. A lamp burner comprising, in combination with an inner and an outer wick tube, a cap for the inner wick tube projecting upwardly from the top thereof with the outer side of its side wall substantially in vertical alinement therewith and having a substantially horizontal groove on the outer side of the upwardly projecting wall and also having a series of perforations in the groove, such groove having an imperforate upper wall forming an air-deflecting surface above and outwardly from the perforations.

2. A lamp burner comprising, in combination with an inner and an outer wick tube, a cap for the inner wick tube having a side wall projecting upwardly from the top of the inner wick tube and having a series of substantially horizontal grooves at the outer

side of the upwardly projecting wall and having perforations through the wall in the grooves, the grooves having imperforate upper walls forming air-deflecting surfaces above and outwardly from the perforations.

3. A lamp burner comprising, in combination with an inner and an outer wick tube, a cap for the inner wick tube provided with a series of annular upwardly and outwardly sloping imperforate air-deflecting surfaces, the cap having air outlets for supplying air from inside the inner wick tube to such air-deflecting surfaces.

4. A lamp burner comprising, in combination with an inner and an outer wick tube, a cap for the inner wick tube provided with a substantially vertically alined series of annular upwardly and outwardly sloping imperforate air-deflecting surfaces arranged above the inner wick tube, the cap having air outlets for supplying air to such air-deflecting surfaces from inside the inner wick tube.

5. An air distributer for a mantle burner having an inner wick tube, such air distributer comprising a hollow cylinder projecting above the inner wick tube and provided with transverse corrugations forming grooves at the outside of the cylinder, the lower walls of the grooves as seen from the outside of the cylinder having perforations therein at a substantial distance inward from the mouths of the grooves and the upper walls of the grooves being imperforate, to deflect outwardly the air issuing through the perforations.

6. An air distributer for a mantle burner having an inner wick tube, such air distributer comprising a hollow cylinder of substantially the same diameter as the inner wick tube and provided at the outside with a series of annular V-shaped grooves and having perforations in the grooves, such grooves having imperforate upper walls constituting upwardly flaring air-deflecting surfaces.

7. An air distributer for a mantle burner having an inner wick tube, such distributer comprising a cap for the inner wick tube having perforated sides and a perforated top, an imperforate conical wall forming a conical chamber above the cap, and a perforated tube projecting above the conical chamber and communicating with the upper portion thereof.

8. A lamp burner comprising, in combination with an inner and an outer wick tube, a cap for the inner wick tube provided with a substantially vertically alined series of annular upwardly and outwardly sloping imperforate air-deflecting surfaces arranged above the inner wick tube, the cap having air outlets for supplying air to such air-deflecting surfaces from inside the inner wick tube, and an air-distributing tube communicating with the interior of and projecting upwardly from the cap.

9. A lamp burner comprising, in combination with an inner and an outer wick tube, a cap for the inner wick tube provided with a substantially vertically alined series of annular upwardly and outwardly sloping air-deflecting surfaces arranged above the inner wick tube, the cap having air outlets for supplying air to such air-deflecting surfaces from inside the inner wick tube, the cap also having a perforated top, an air-preheating chamber above the cap and communicating with the interior of the cap through the perforations in the top thereof, and a perforated air-distributing tube communicating with such air chamber and projecting upwardly therefrom.

10. An air distributer for a mantle burner having an inner wick tube, such air distributer comprising a cap for the inner wick tube having a side wall projecting upwardly from the top of the inner wick tube and having a series of substantially horizontal grooves at the outer side of the upwardly projecting wall and having perforations through the wall in the grooves, the grooves having imperforate upper walls forming air-deflecting surfaces above and outwardly from the perforations, a perforated top for the cap, a conical chamber above the top of the cap, and a perforated tube of smaller diameter than the cap and projecting concentric therewith upwardly from the upper end of the conical chamber and communicating therewith.

11. An air distributer for a mantle burner having an inner wick tube, such air distributer comprising a cylinder provided with a series of annular upwardly flaring air-deflecting surfaces and having outlet openings for supplying air beneath these surfaces, a perforated tube of smaller diameter than the cylinder arranged concentrically above the cylinder, and a conically tapering wall connecting the upper end of the cylinder with the lower end of such tube.

12. An air distributer for a mantle burner having an inner wick tube, such air distributer comprising a hollow cylinder of substantially the same diameter as the inner wick tube and provided at the outside with a series of annular V-shaped grooves and having perforations in the grooves, a perforated top for the cylinder, an imperforate conical wall extending upward from the upper end of the cylinder, such conical wall forming a tapering continuation of the cylinder above the perforated top thereof, and a tube of smaller diameter than the cylinder forming an upward continuation of the conical wall, such tube being closed at its upper end and having lateral perforations therein.

13. A lamp burner comprising, in combination with an inner and an outer wick tube, a cap for the inner wick tube provided with a substantially vertically alined series of annular upwardly and outwardly sloping imperforate air-deflecting surfaces arranged above the inner wick tube, the cap having air outlets for supplying air to such air-deflecting surfaces from inside the inner wick tube, the cap also having a perforated top, an air-preheating chamber above the cap and communicating with the interior of the cap through the perforations in the top thereof, and a perforated air-distributing tube communicating with such air chamber and projecting upwardly therefrom.

14. An air distributer for a mantle burner having an inner wick tube, such air distributer comprising a cylinder provided with a series of annular upwardly flaring imperforate air-deflecting surfaces and having outlet openings for supplying air beneath these surfaces, a perforated tube of smaller diameter than the cylinder arranged concentrically above the cylinder, and a conically tapering imperforate wall connecting the upper end of the cylinder with the lower end of such tube.

15. An air distributer for a mantle burner having an inner wick tube, such air distributer comprising a hollow cylinder of substantially the same diameter as the inner wick tube and provided at the outside with a series of annular V-shaped grooves and having perforations in the grooves, such grooves having imperforate upper walls constituting upwardly flaring air-deflecting surfaces, a perforated top for the cylinder, an imperforate conical wall extending upward from the upper end of the cylinder, such conical wall forming a tapering continuation of the cylinder above the perforated top thereof, and a perforated tube of smaller diameter than the cylinder forming an upward continuation of the conical wall.

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

HERBERT E. RIDER

Witnesses:
WM. ASHLEY KELLY,
VICTOR D. BORSE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."