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W. R. JEAVONS.

OIL BURNER.

APPLICATION FILED MAR. 5, 1907.

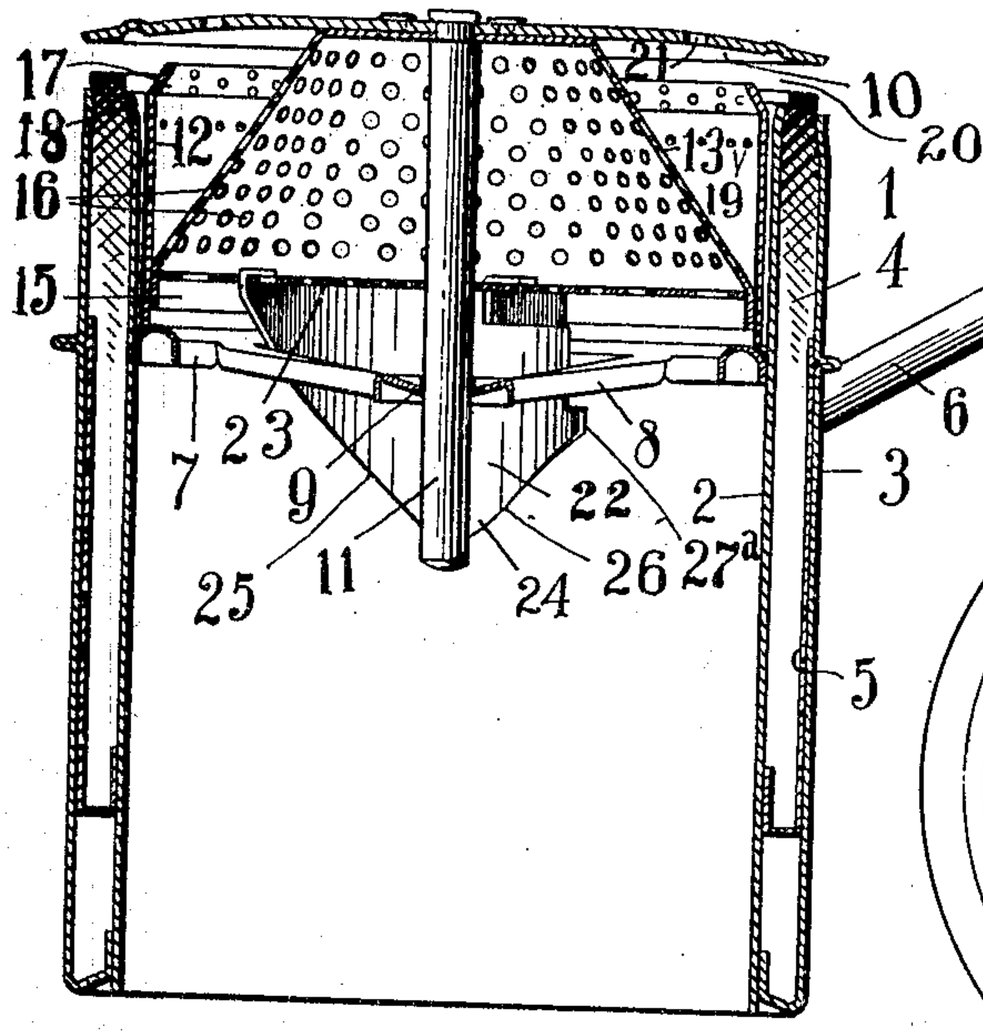

Fig. 1

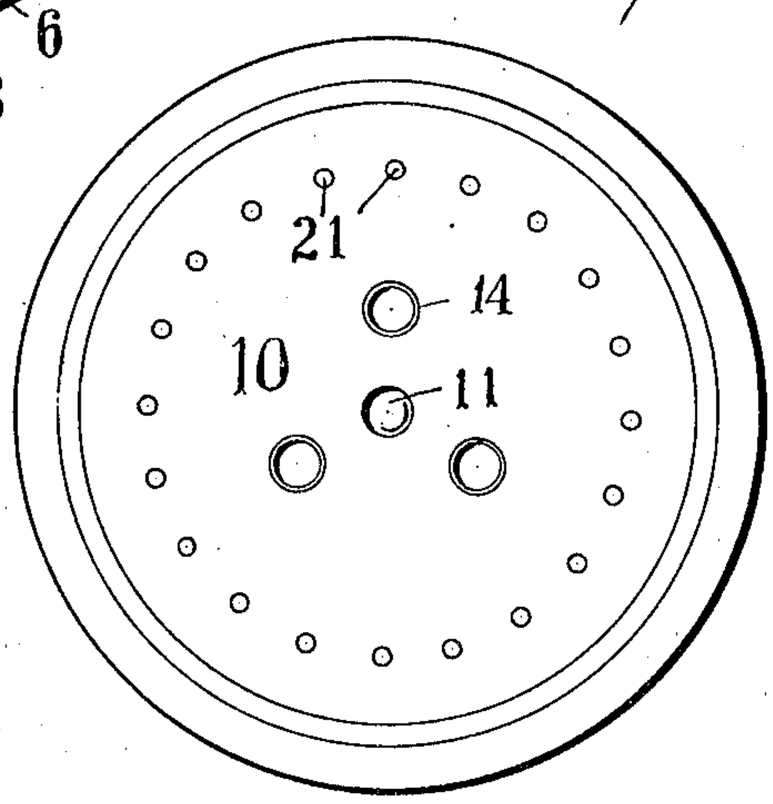

Fig. 3

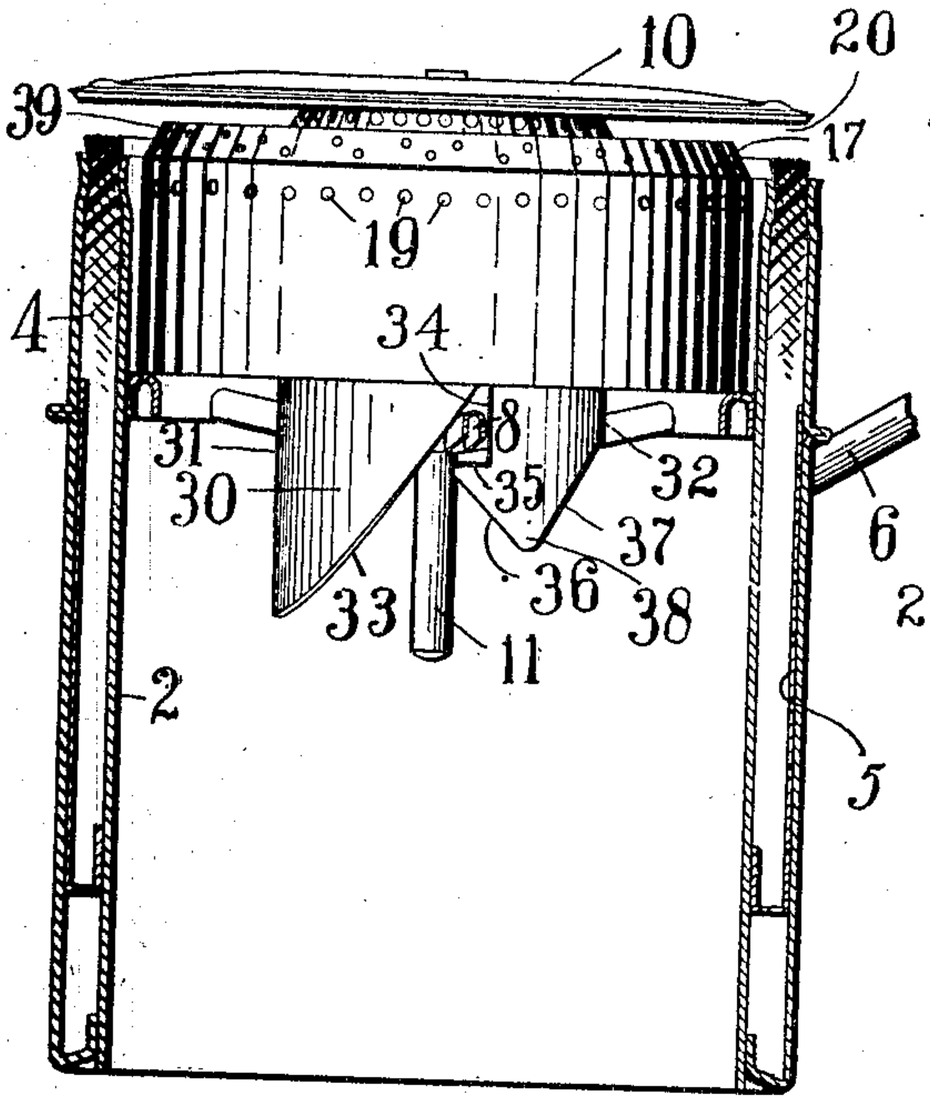

Fig. 2

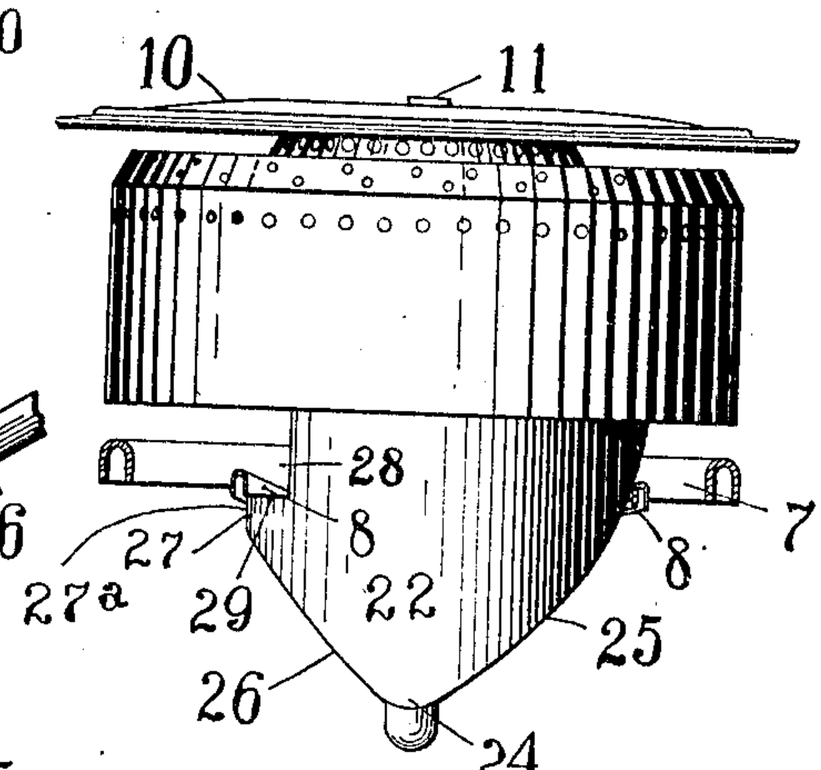

Fig. 4

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OIL-BURNER.

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To all whom it may concern:

Be it known that I, WILLIAM R. JEAVONS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Oil-Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to burners, and especially to burners of oil stoves and to the air distributers and spreaders employed therewith, and has for its object to improve the construction of said distributers and spreaders in such manner as to prevent the overheating of the same and of the associated burner parts.

A further object of the invention, which is associated with the idea of preventing the overheating of the burner parts, is the provision of means for preventing, through anchoring the spreader, the turning of the wick to such an extent as to lose control of it, thus safeguarding the device against the production of flames of dangerous height by a careless or unskilled operator.

A still further object of the invention is to improve the construction whereby air is supplied to the burner flame closely adjacent to the inner surface of the wick.

I accomplish these objects by means of the constructions shown in the accompanying drawings, wherein

Figure 1 represents a vertical sectional view of a burner constructed in accordance with my invention; Fig. 2 represents a similar view, showing the air-distributing parts in elevation and illustrating a modification of the means for locking the said parts against vertical displacement; Fig. 3 represents a top plan view of the spreader; and Fig. 4 represents a side elevation of the air distributer and the supporting ring therefor, the ring being broken away to illustrate the manner in which the anchoring mechanism shown in Fig. 1 operates.

In operating burners of the "blue flame" type wherein the blue flame is produced without the intervention of perforated commingling or combustion tubes, it frequently happens that the flame which ascends from the wick, if rather high, overlaps the top of the spreader and, owing to the partial vacuum which is formed between the outer edge of the spreader and the central portion thereof, impinges directly upon the top of the spreader, thereby heating the same excessively, and eventually communicates by conduction and radiation an undesirable and dangerous amount of heat to the wick tubes.

Furthermore, for convenience of assembling and cleaning, it is desirable that the spreader and its associated air-distributing parts should be readily removable from the burner.

In the type of burner wherein a blue flame is produced without the employment of perforated combustion or commingling tubes, the outer edge of the spreader extends across the wick tubes and is spaced a short distance thereabove. An unskilled operator in attempting to elevate or lower the wick frequently turns the shaft of the spur wheel so far in a direction to elevate the wick that the wick engages the outer periphery of the spreader, and the spreader, together with its associated distributing parts, is lifted from its seat, and, by further turning of the spur wheel, the wick is elevated until the spur wheel disengages the wick carrier, whereupon it is difficult, if not impossible, should the operator see the mistake, to turn the blazing wick down within the tubes. This contretemps has frequently occurred in the operation of burners of the type described, and is a cause of great alarm and danger to the operator as well as peril to the house itself within which the stove is located. By the construction herein illustrated and described, I am enabled to prevent the occurrence of these objectionable results and at the same time permit the ready removal of the air-distributing parts, should it be desirable or necessary to do so.

In the aforesaid drawings, 1 represents a burner, the same comprising an inner wick tube 2 and an outer wick tube 3 having interposed therebetween a wick 4 provided with a wick carrier 5. This wick carrier may be of any preferred type and is shown as comprising a perforated metallic band on the outside of the wick connecting with a short inner band at the lower end of the wick.

6 denotes a wick-raising shaft which may be provided with a spur wheel (not shown) engaging the wick carrier.

Within the interior of the inner wick tube, at a short distance below the top thereof,

there is suitably secured a ring 7, said ring having a plurality of arms 8 projecting inwardly therefrom and carrying at the center of the wick tube a socket 9. The ring 7, arms 8 and socket 9 are adapted to support, center and anchor the air-distributing device, which will now be described. The said air-distributing device comprises a spreader 10 having riveted to the central portion thereof a spinde 11.

Spindle 11 is of sufficient length to enable its lower end to be fitted into and guided by the socket 9 to center the associated parts with respect to the wick tubes.

12 denotes a vertically extending ring of less external diameter than the internal diameter of wick tube 2 to enable it to be freely and removably fitted thereinto and to provide a space therewith.

13 denotes a frusto-conical ring the upper end of which bears against the lower surface of the spreader 10 and is secured thereto, as by eyelets 14. The lower end of 13 is provided with a vertically extending flange 15 which fits closely the inner surface of the ring 12 and is secured thereto in any suitable manner. Frusto-conical ring 13 is provided with large perforations 16 to permit the free and unobstructed flow of air from the interior of the wick tubes therethrough. The upper end of the ring 12 is flared or bent inwardly, as shown at 17, the base of such flared portion being formed by a knee or bend in substantially the same plane as the upper ends of the tubes 2 and 3. The upper end of the inner tube is bent outwardly at 18, providing a relatively wider space between the same and the adjacent portion of ring 12. Such adjacent portion of ring 12 may be provided with a number of perforations 19 for the purpose of supplying air to the said space and to the primary flame which is formed at the inner surface of the wick, and the upward trend of the limited air thus supplied prevents the downward drift and condensation of any vapor in the space between the ring and inner wick tube. With the parts proportioned as described, there is provided a free passageway 20 for air below the spreader 10 and the upper edge of ring 12 and the subjacent tubes and wick.

To prevent the overheating of the spreader 10 by the action of the flame hereinbefore described, I provide said spreader with a row of perforations 21 located near the outer edge thereof, that is to say within the outer half of the distance from the center to the periphery of the spreader and about two-thirds of such distance from the center. These openings establish communication between the passageway which is provided over the wick and the wick tubes, and the air space above the spreader and the relatively small quantity of air which flows through said openings effectually destroys the partial vacuum that would otherwise be formed at this point and prevents the flame from the burner from curling down and impinging upon the upper surface of the spreader.

To prevent the wick from lifting the spreader and the associated air-distributing parts by engagement therewith and avoid the danger of fire from turning the wick too high and at the same time enable the operator to remove the said parts when desirable for the purposes of cleaning and repair, I provide the distributing parts with means for automatically locking the same in position by the act of inserting or dropping the spreader and its parts into the upper part of the inner wick tube. In Figs. 1 and 4, I show one form of the means by which this result is accomplished. In these figures, 22 denotes a locking member which is carried by the air-distributer and preferably by the freely perforated plate or diaphragm 23 which is provided within the lower portion of the frusto-conical ring 13. This locking member is shown as a curved plate, the upper end whereof is fastened to plate or diaphragm 23 in any desired manner. The lower portion of this plate is provided with a point 24, and the edge of said plate is beveled or inclined upwardly from such point and on opposite sides thereof. One such beveled edge 25 extends from the point at least as far as the lower edge of the ring 12 and may extend as far as the plate 23. The other edge comprises a shorter beveled portion 26 and a short and substantially vertical portion 27, above which the plate is cut away to form a notch 28. It will be observed, by reference to Fig. 4, that the effective width of the plate between the upper end of 27 and the opposite inclined edge 25 of said plate is substantially equal to the distance between the two arms 8 of the ring 7. From this construction it follows that, by merely dropping the air distributer into the top of the inner wick tube with the lower end of the spindle 11 in the socket 9, the lower end of plate 22 will generally strike somewhere between a pair of arms 8 and that either the inclined surface 25 or nclined surface 26 will engage one of said arms, according to which of the said arms may be nearer to the point 24, and that the inclination of such edge will cause the air distributer to be rotated by gravity upon the spindle as an axis. The vertical extension 27 of edge 26 permits the lateral projection 27^a to clear the arm adjacent thereto. No matter to which of the two arms the point 24 may be nearer at the time when the plate 22 is inserted therebetween, by the time the upper end of the surface 27 has cleared the lower surface of its adjacent arm 8, the action of the inclined surface 25 on its arm will cam or rotate the deflector until the horizontal sur-

face 29 of projection 27ª is beneath its adjacent arm, thereby locking the distributer in place against direct removal in a vertical line, such as would occur by the wick engaging the spreader. Should, however, the operator desire to remove the distributer, by merely twisting the same, it will be unlocked from the arm or anchoring member and may be lifted out.

In Fig. 2 I have shown a modification of the form of locking device shown in Fig. 1. In this modification, an aperture is provided between two plate members, one of which, 30, is provided with a vertical edge 31, and the other with a vertical edge 32, the former edge being considerably longer than the latter. From the lower end of edge 31, there extends an upwardly inclined edge 33. Extending downwardly with respect to the upper portion of inclined edge 33 is a short vertical edge 34 and projecting horizontally from the lower end of 34 toward edge 33 is the ledge 35. From the outer end of 35 the plate is provided with an inclined edge 36, the inclination of which is the reverse of the inclination of edge 33. From the lower end of 36, there extends an oppositely inclined edge 37, the upper end of which merges with the vertical edge 32. With the construction just described, the air distributer is dropped into the inner tube as before in such manner that one of the anchoring members or arms 8 is within the space provided between the lower end of 31 and the point 38 which is provided at the junction of the inclined edges 36 and 37. Should the edge 36 strike the anchoring member, said edge cams the distributer towards the right until the anchoring member clears the ledge 35. It then engages the edge 33, which cams the deflector to the left, bringing the ledge 35 vertically below the arm or anchoring member and locking the deflector in place. Should the edge 33 strike an arm or anchoring member, said edge will cam the distributer toward the left, bringing ledge 35 beneath said arm or member. As previously stated, in substantially the same plane as the top of the inner wick tube, the ring 12 is deflected inwardly, as shown at 17; such deflected portion is provided with a suitable number of perforations 39 for the supply of an additional amount of air at this point to the primary flame and to the vapor within the inner edge of the wick. I have found that by forming a knee or bend in the ring at a point substantially flush with the upper edge of the inner wick tube, I secure better results in the flame produced than when the bend is made at a point lower down, and that the provision of the bend at this point with the inwardly directed flange extending above the tubes effectively breaks up the disagreeable humming noise which is often

knee or bend is located further down and the flange forms a large pocket with the inner wick tube.

I claim:

1. In an oil burner, the combination of an inner and an outer wick tube, a wick between said tubes, an air spreader extending above and across the tops of said tubes and wick and forming with the same a narrow passageway for air from the interior of the burner, there being an air space provided above the spreader and said spreader having a portion extending inwardly in a horizontal direction from above the wick and being provided in such portion with a series of perforations arranged to discharge air from the narrow passageway below the spreader directly to the outer portion of the air space above the spreader, substantially as specified.

2. In an oil burner, the combination of an inner and an outer wick tube, a wick therebetween, a vertically extending ring within the upper portion of the inner wick tube and forming with the upper end of said tube a space or chamber, a spreader plate extending above and across the tops of said wick tubes and ring and forming with the same a narrow passageway for air from the interior of the burner, said spreader plate extending inwardly in a horizontal direction from above said wick and having a series of perforations in the outer portion thereof arranged to discharge air from the passageway directly to the space above said spreader plate, substantially as specified.

3. In an oil burner, the combination of an inner and an outer wick tube, the inner wick tube being provided with an outwardly flaring upper end, a vertically extending ring within the upper portion of the inner wick tube and spaced therefrom, there being an enlarged space or chamber provided by and between the flared upper end of said inner wick tube and the adjacent vertical portion of said ring, said ring having perforations communicating with the space between itself and the inner wick tube to supply air in limited quantity to said space, substantially as specified.

4. In an oil burner, the combination of an inner and an outer wick tube, a wick, a vertically extending ring within the inner wick tube, there being a space provided between said inner wick tube and said ring providing an air way to the base of the wick, said ring having a flange projecting inwardly from substantially the plane of the top of the inner wick tube, said flange having perforations to supply air from the interior of the inner wick tube therethrough and above the plane of the top of the inner wick tube, substantially as specified.

5. In a burner, the combination of an inner and an outer wick tube, a spreader extending across the upper ends of said tubes

and spaced therefrom, and a vertically extending ring within and spaced from the inner wick tube to form therewith an air passage, said ring being provided with an inwardly directed flange at the upper end thereof, the knee formed by the junction of the ring and flange being in substantially the same plane as the top of the inner wick tube, substantially as specified.

6. In a burner, the combination of an inner and an outer wick tube, a spreader extending across the upper ends of said tubes and spaced therefrom, and a vertically extending ring within the inner wick tube and spaced therefrom to form an air passage, said ring having an inwardly directed flange at the top thereof, the knee formed by the junction of the ring and flange being in substantially the same plane as the top of the inner wick tube, said ring having perforations therethrough below said knee for supplying air in limited quantity to said passage, substantially as specified.

7. In an oil burner, the combination of inner and outer wick tubes, a member anchored within the inner wick tube, an air distributer comprising a spreader and provided with a laterally extending locking projection and having an inclined or cam portion below said projection and adapted to engage the said anchored member to automatically rotate the said distributer and move the said projection vertically beneath the said anchored member, substantially as specified.

8. In an oil burner, the combination of an inner and an outer wick tube, the inner wick tube being provided with a seat and being provided with one of a pair of interlocking members, an air distributer comprising a spreader adapted to extend across the tops of said tubes, said distributer having an engaging portion for imparting to it a rotary movement and having a portion adapted to rest on said seat and also having a locking member adapted to automatically interlock with the first-mentioned locking member and prevent removal of said distributer in a direct vertical line, substantially as specified.

9. In an oil burner, the combination of an inner and an outer wick tube, an anchored locking member within the inner tube, an air distributer comprising a spreader adapted to extend across said tubes, a seat for the distributer, said distributer having a locking member adapted to be brought into locking engagement with the first-mentioned member, and means for automatically rotating the latter member into locking engagement with the former by the application of the distributer to its seat, substantially as specified.

10. In an oil burner, the combination of an inner and an outer wick tube, an air distributer comprising a spreader and having a locking member projecting therefrom, an anchored member within the inner wick tube, said locking member comprising a hook adapted to project beneath the anchored member, and having an inclined surface adapted to drive said hook beneath said anchored member, substantially as specified.

11. In an oil burner, the combination of an inner and an outer wick tube, a spreader having a locking member operatively connected thereto, and an anchored member within the inner tube, said locking member comprising a hook having adjacent thereto an inclined surface which is adapted to engage said anchored member and automatically drive the hook therebeneath, substantially as specified.

12. In a burner, the combination of an inner and an outer wick tube, a wick, a spreader extending across the upper ends of said tubes and spaced therefrom, and a vertically extending ring within and spaced from the inner wick tube to form therewith an air passage supplying air to the base of the wick, said ring having an inwardly directed flange at the upper end thereof, the knee or bend formed by the junction of the ring and flange being in substantially the plane of the top of the inner wick tube, said flange being provided with perforations for admitting air from the interior of the inner wick tube therethrough, and means for admitting air in limited volume to the space between the vertically extending portion of the ring and the inner wick tube, substantially as specified.

13. In a burner, the combination of an inner and an outer wick tube, a spreader extending across the upper ends of said tubes and spaced therefrom, and a vertically extending ring within and spaced from the inner wick tube to form therewith an air passage supplying air to the base of the wick, said ring having an inwardly directed flange at the upper end thereof, the knee or bend formed by the junction of the ring and flange being in substantially the plane of the top of the inner wick tube, said ring having perforations therethrough between the knee or bend and the bottom thereof, substantially as specified.

14. In a burner, the combination of an inner and an outer wick tube, a spreader extending across the upper ends of said tubes and spaced therefrom and forming therewith a narrow passageway for air from the interior of the burner, a ring within the inner wick tube extending vertically as high as the top of the inner wick tube and forming an annular passage therewith, and means for supplying air in limited volume to said passage at a point between the top and bottom of said ring and below the top of the inner wick tube, substantially as specified.

15. In a burner, the combination of an inner and an outer wick tube, a wick, a spreader

extending across the upper ends of said tubes and spaced therefrom, a vertically extending ring within and spaced from the inner wick tube to form therewith an air passage supplying air to the base of the wick, said ring having an inwardly directed flange at the upper end thereof, the knee or bend formed by the junction of the ring and flange being in substantially the plane of the top of the inner wick tube, and means for supplying air in limited volume to the said air passage at a point between the top and bottom of the ring, substantially as specified.

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

WILLIAM R. JEAVONS.

Witnesses:
J. B. HULL,
S. E. FOUTS.