July 10, 1934. C. M. BREED 1,966,282

WICK OIL BURNER

Filed Nov. 17, 1930 2 Sheets-Sheet 1

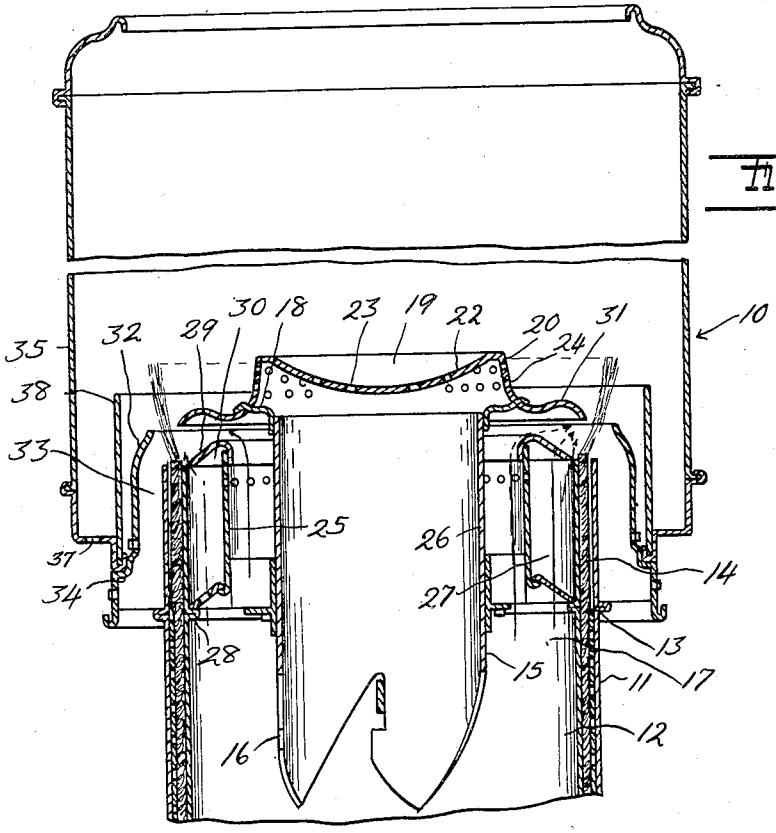


Fig. 1.

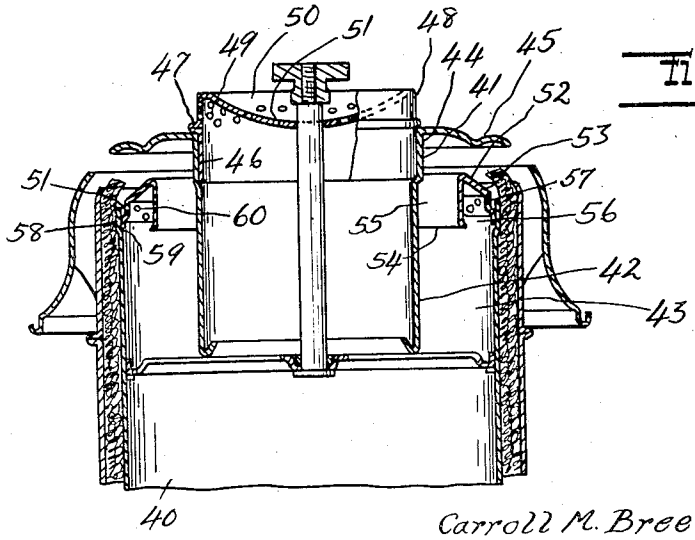


Fig. 2.

INVENTOR

Carroll M. Breed

BY Whittemore Hulbert

Whittemore & Belknap

ATTORNEYS

July 10, 1934. C. M. BREED 1,966,282

WICK OIL BURNER

Filed Nov. 17, 1930 2 Sheets-Sheet 2

Fig. 3.

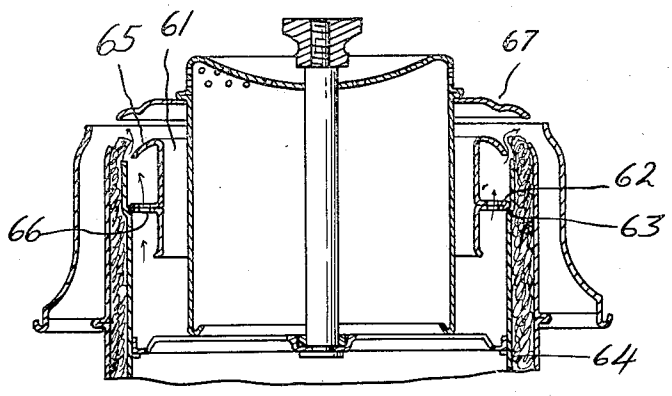
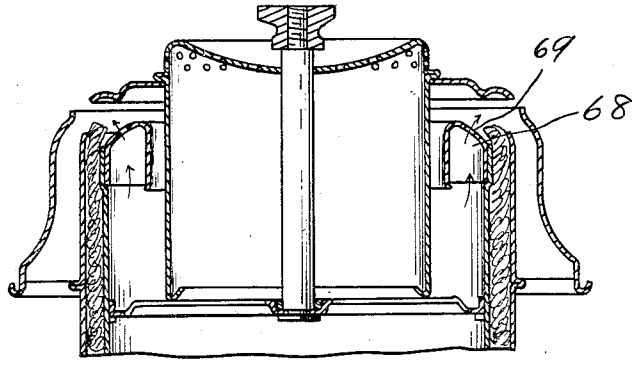


Fig. 4.



INVENTOR
Carroll M. Breed

BY Whittemore Hulbert
Whittemore & Belknap

ATTORNEYS

Patented July 10, 1934

1,966,282

UNITED STATES PATENT OFFICE

1,966,282

WICK OIL BURNER

Carroll M. Breed, Ypsilanti, Mich.

Application November 17, 1930, Serial No. 496,278

6 Claims. (Cl. 158—94)

This invention relates to oil burners of the wick type and is a continuation in part of my copending application, Serial No. 300,893, filed August 20, 1928.

One of the principal objects of this invention is to simplify, render more efficient and improve generally oil burner constructions. The invention contemplates materially increasing the efficiency of oil burner constructions of the type specified above by providing means for supplying oxygen to the flame at spaced points throughout the length thereof, thereby materially enhancing production and rendering it possible to utilize a higher flame than heretofore has been considered practical.

With the foregoing as well as other objects in view, the invention resides in the novel details of construction illustrated and about to be described.

In the drawings:

Figure 1 is a central sectional view through an oil burner constructed in accordance with this invention;

Figure 2 is a fragmentary sectional view of a slightly modified form of construction;

Figure 3 is a view similar to Figure 2 showing another modified form of construction; and

Figure 4 is a view similar to Figure 2 showing still another modified form of the invention.

Referring now to the drawings, it will be noted that there is illustrated in Figure 1 an oil burner 10 comprising an annular casing 11 and a wick tube 12 arranged within the casing 11 concentric therewith. The wick tube 12 is preferably of smaller diameter than the casing 11 so as to provide an annular space 13 for receiving the wick 14. Arranged within the wick tube 12 is a flame spreader 15 having an annular body portion 16 of less diameter than the wick tube and cooperating with the latter to form an annular vertically extending air passage 17. The body portion 16 of the flame spreader is secured within the wick tube in any suitable manner preferably at the lower end as shown in Figure 1 and the upper end thereof projects above the upper edge of the wick tube and is provided with a circular laterally extending flange 18 upon which a suitable cap 19 is secured. The cap 19 is provided with an inwardly upwardly extending inclined annular wall 20 and a depressed or concave top wall 22 having openings 23 therein for expelling a certain amount of the air flowing upwardly through the flame spreader body 16. The inclined annular side wall 20 of the cap is provided with laterally directed openings 24 for discharging air laterally outwardly against the upper portions of the flame. In this connection it is to be noted that the concave top wall 22 of the cap serves to deflect the greater portion of the air flowing through the flame spreader body 16 laterally outwardly as specified above.

Arranged within the wick tube 12 concentric with the latter and flame spreader body 16 is an annular collar 25 of such diameter as to divide the passage 17 into two separate passages 26 and 27. The lower end of the collar is seated upon an internal annular shoulder 28 formed on the wick tube 12, while the upper end of the collar preferably projects beyond the upper end of the wick tube and is provided with a downwardly inclined annular flange 29 terminating at the outer edge thereof adjacent the upper end of the wick tube and forming a baffle 30. The construction is such that the air flowing through the inner air passage 27 strikes the air baffle channel 30 and is deflected outwardly into engagement with the flame at its base. The air flowing through the annular passage 26, on the other hand, is deflected by the flame spreader flange 31 forming a part of the cap, into engagement with the central portions of the flame, and since the cap portion 22 of the flame spreader serves to deflect air against the upper portions of the flame, it will be seen that the latter is supplied with air throughout the length thereof resulting in substantially perfect combustion.

In order to further increase the supply of air to the flame, I provide an annular collar 32 surrounding the casing 11 in spaced relation thereto to provide an air passage 33. The collar 32 curves inwardly at the upper end thereof and extends beyond the wick tube terminating adjacent the outer edge of the flame spreader flange 31. The arrangement is such that the flame spreader flange directs air flowing through the passage 27 outwardly into engagement with the flame at a central point, while the collar 32 serves to deflect the air flowing through the passage 33 inwardly at substantially the same point. The collar is provided adjacent the lower edge thereof with an annular shoulder 34 adapted to form a seat for the drum 35 having an annular bottom wall 36 extending outwardly from the shoulder and apertured as at 37 for the passage of air. Arranged within the drum 35 intermediate the collar 32 and side wall of the drum is a flange 38 extending upwardly beyond the upper edge of the collar 32 and serving to deflect the air passing upwardly through the openings 37 into contact with the flame at a point substantially opposite the

point of contact of the air flowing through the annular wall 20 of the cap.

The modification illustrated in Figure 2 differs from the previous described form of the invention in the construction of the flame spreader and wick tube. In detail, the construction illustrated in Figure 2 comprises a wick tube 40 and a flame spreader 41 having a tubular body portion 42 arranged within the wick tube and cooperating therewith to form an annular vertically extending passage 43 for the passage of air. The body portion 42 of the flame spreader is provided with an outwardly offset wall 44 adjacent the upper end thereof terminating in a laterally and outwardly extending flame spreader flange 45. The flange 45 is positioned a substantial distance above the wick tube and extends laterally outwardly beyond the same for reasons to be more fully hereinafter set forth. Sleeved within the offset portion of the flame spreader body is a tubular cap 46 having an outwardly extending bead 47 intermediate the ends thereof adapted to seat upon the upper edge of the flame spreader body. The portion of the tubular cap 48 above the annular bead 47 is provided with laterally directed openings 49 therein, while the top wall 50 of the cap is concaved, as shown in Figure 2, and apertured as at 51. The arrangement is such that the concave top wall 50 of the cap serves to deflect the air passing upwardly through the tubular flame spreader body laterally outwardly above the flame spreader flange 45 into engagement with the upper portions of the flame.

Arranged within the space between the wick tube and tubular flame spreader body is an air baffle 52 in the form of an inverted substantially channel-shaped ring. The base portion 53 of the inverted substantially channel-shaped ring is inclined upwardly and inwardly from the wick tube and terminates at the inner edge in a depending leg or flange 54 adapted to divide the space 43 between the flame spreader and wick tube into two passages 55 and 56. The outer edge of the base portion 53 terminates in a depending flange portion 57 spaced laterally inwardly from the upper end of the wick tube and terminating in an outwardly flared portion 58 slidably engaging the inner surface of the wick tube and seated upon an annular shoulder 59 formed on the latter tube. The flange 57 is provided with openings 60 therein for discharging the air flowing through the passage 56 into the channel-shaped baffle, laterally outwardly into contact with the base portions of the flame. In this connection it is to be noted that the air flowing upwardly through the passage 55 is deflected by the flame spreader flange 45 outwardly into engagement with the central portions of the flame. From the foregoing, it will be observed that the construction of the burner illustrated in Figure 2 is extremely simple and so designed as to supply air to the flame at various points throughout the length thereof.

The modification illustrated in Figure 3 is substantially the same as the construction just described with the exception that the inverted channel-shaped ring, set forth in the above-described form of the invention, is eliminated and a collar 61 is substituted therefor. As shown in Figure 3, the collar 61 is provided with an outwardly extending return-bent portion 62 intermediate the ends thereof adapted to rest upon an annular shoulder 63 formed on the inner surface of the wick tube 64 adjacent the upper end thereof. The upper end of the collar 61 extends beyond the adjacent end of the wick tube and is provided with a downwardly and outwardly curved flange 65 terminating adjacent the upper end of the wick tube. The above arrangement is such that air flowing upwardly through the wick tube is divided upon reaching the collar and a portion of the same flows upwardly through suitable apertures 66 formed in the return-bent portion 62 into engagement with the flange or baffle 65. The baffle 65 collects the air flowing upwardly through the apertures 66 and directs the same laterally outwardly into engagement with the flame adjacent the source thereof. The air flowing upwardly between the inner surface of the collar and flame spreader 67 follows the same course as hereinbefore stated in connection with the construction shown in Figure 2.

The modification illustrated in Figure 4 is somewhat similar in construction to the modified form of the invention illustrated in Figure 2 with the exception that the inverted substantially channel-shaped ring 68 in Figure 4 is provided with openings 69 in the downwardly and outwardly inclined base portion thereof for deflecting the air laterally into engagement with the flame adjacent the source of the same.

Thus, from the foregoing it will be observed that in each of the above modifications means is provided within the passage, formed by the wick tube and flame spreader, for collecting some of the air flowing through this passage and directing the same laterally outwardly into engagement with the flame at the source of the same. It will further be apparent that in each of the constructions described above means is also provided for directing air against the flame at various other points throughout the length thereof.

What I claim as my invention is:

1. In a oil burner, a wick tube, a flame spreader having a tubular body portion located within the wick tube with the side walls thereof in spaced relation to the inner sides of the wick tube so as to form an annular passage for air therebetween, a baffle having a tubular portion located within the passage in concentric relation to the flame spreader body and wick tube and dividing said passage into inner and outer air passages, said baffle having another portion extending outwardly from the upper end of the tubular portion aforesaid and operable to direct air flowing through the outer passage laterally outwardly adjacent the upper end of the wick tube, an annular flange fixed to the flame spreader body in vertical spaced relation to the outwardly extending portion of the baffle and cooperating therewith to form a laterally extending passage for the air flowing through said inner passage, and means in the flame spreader above the flange aforesaid for directing the air flowing through the body portion of the flame spreader laterally outwardly toward the flame above the flange.

2. In an oil burner, a wick tube, a flame spreader having a tubular imperforate body portion located within the wick tube with the side walls thereof in spaced relation to the inner sides of the wick tube so as to form therewith an annular space, a baffle having a tubular imperforate portion located within the space in concentric relation to the flame spreader body and adjacent walls of the wick tube and dividing the space therebetween into inner and outer air passages, said baffle having an annular flange extending outwardly from the upper end of the annular portion aforesaid and operable to direct air flowing through the outer passage laterally outwardly adjacent the upper end of the wick tube, means

on the flame spreader cooperating with the annular flange of the baffle for deflecting all of the air flowing through the inner passage laterally outwardly, and means in the flame spreader for deflecting air flowing through the flame spreader body laterally outwardly above the means aforesaid.

3. In an oil burner, a wick tube, a flame spreader having a body portion located within the wick tube in spaced relation to the latter forming a passage for air therebetween, a baffle having a portion extending into the passage between the flame spreader body and wick tube dividing the passage into inner and outer air passages, said baffle having another portion extending outwardly from the upper end of the portion aforesaid and connected to the upper end of the wick tube and having openings therethrough directing air flowing upwardly through the outer passage laterally outwardly adjacent the upper end of the wick tube, and means directing air flowing through the inner passage laterally outwardly above the last named portion of the baffle.

4. In an oil burner, a wick tube, a flame spreader having a body portion located within the wick tube and cooperating with the latter to form a passage for air therebetween, a baffle having a portion dividing the passage into inner and outer air passages, said baffle having another portion extending outwardly from the upper end of the portion aforesaid toward the upper end of the wick and tube and operable to direct air flowing through the outer passage laterally outwardly adjacent the upper end of the wick tube, and an annular flange fixed to the flame spreader body in vertical spaced relation to the outwardly extending portion aforesaid of the baffle directing air flowing through the inner passage laterally outwardly above said outwardly extending portion of the baffle.

5. In an oil buriner, a wick tube, a flame spreader having a body portion located within the wick tube with the side walls thereof in spaced relation to the side walls of the wick tube so as to form with the latter a passage for air, an annular baffle of inverted U-shaped cross section arranged within the wick tube with the outer flange secured to the upper end of the wick tube and with the inner flange cooperating with the flame spreader body to divide said passage into inner and outer passages, said baffle having openings therethrough for directing air flowing upwardly through the outer passage laterally outwardly adjacent the upper end of the wick tube, and means for directing the air flowing through the inner passage laterally outwardly above said baffle.

6. In an oil burner, a wick tube, a flame spreader having a body portion located within the wick tube and cooperating with the latter to form a passage for air therebetween, a baffle carried by the wick tube having an annular portion extending inwardly from the upper end of the wick tube and having a downwardly extending portion at the inner extremity of the annular portion dividing said passage into inner and outer passages, said baffle having openings therethrough directing air flowing upwardly through the outer passage laterally outwardly adjacent the upper end of the wick tube, and means carried by the flame spreader above the baffle and operable to direct the air flowing through the inner passage laterally outwardly.

CARROLL M. BREED.