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G. M. KERRIHARD ET AL

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OIL GAS BURNER

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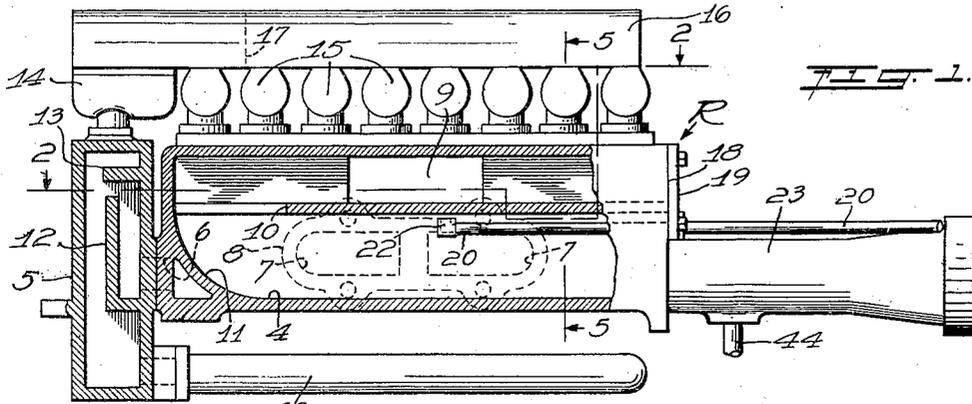


FIG. 1.

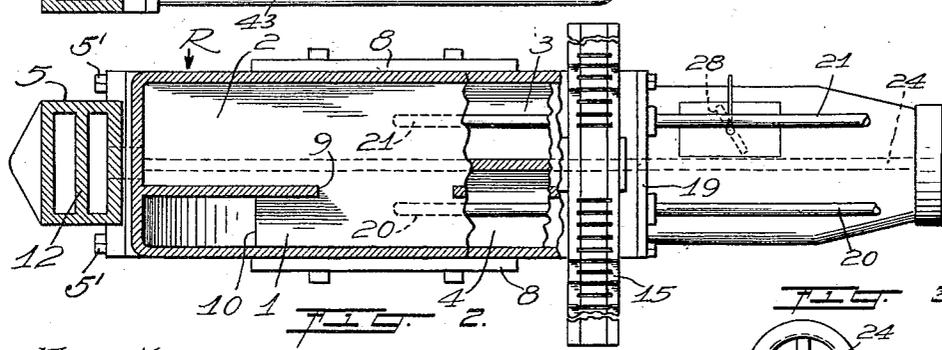
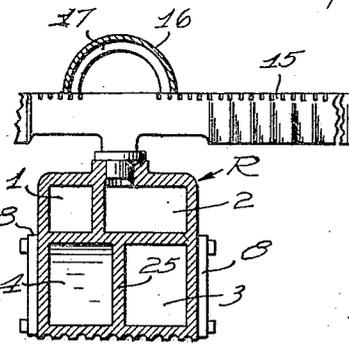


FIG. 2.



# UNITED STATES PATENT OFFICE

GEORGE MILLER KERRIHARD AND MAXWELL LATIMER KERRIHARD, OF RED OAK, IOWA, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO KAYBAR BURNER CORPORATION, OF CHICAGO, ILLINOIS

## OIL GAS BURNER

Application filed September 17, 1928. Serial No. 306,340.

Our invention relates to improvements in oil gas burners, and it consists in the combinations, constructions, and arrangements herein described and claimed.

5 An object of our invention is to provide an oil gas burner in which an effective control of a blue flame device may be attained.

A further object is to provide a device in which it is not necessary to continue burning the heating unit constantly in order to provide an operative device.

A further object is to provide a gas oil burner in which the accumulation of carbon may be reduced to a minimum.

15 A further object is to provide a gas oil burner in which oil gas, and air are efficiently mixed prior to being burned.

A further object is to provide a gas oil burner which may be effectively regulated by means of a suitable thermostat located in the living quarters.

A further object is to provide an oil gas burner in which an arrangement of baffles is provided for permitting an efficient mixture and burning of the mixture.

25 Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

30 Our invention is illustrated in the accompanying drawings, forming part of this application, in which

Figure 1 is a side elevation, partly in section, of our device,

35 Figure 2 is a sectional view taken substantially along the line 2—2 of Figure 1,

Figure 3 is a detail view of a portion of our device,

40 Figure 4 is a detail of a portion of our device,

Figure 5 is a sectional view taken along the line 5—5 of Figure 1, and

Figure 6 is a diagrammatic view showing an installation embodying our invention.

45 In carrying out our invention, we make use of a retort R comprising a series of compartments 1, 2, 3, and 4. The compartments 3 and 4 may be termed primary and secondary generating compartments respectively. The re-  
50 tort is an elongated construction substantial-

ly rectangular transversely, as shown in Figure 5. A casing 5 is secured to one end of the retort by means of suitable bolts 5'. The interior of the casing 5 is in communication with the primary compartment 3 by reason 55 of a passageway 6.

The retort is provided with openings 7 upon each side, as shown in Figure 1, which are normally closed by means of suitable plates 8. The compartments 1 and 2 are in communication by reason of an opening 9. An opening 10 places the compartment 4 in communication with the compartment 1. One end of the secondary compartment 4 is provided with a curved surface 11 leading to the 65 opening 10. The purpose of this will be explained later.

The casing 5 is provided with a baffle 12 disposed in alignment with the passageway 6. A baffle 13 is disposed relatively near the 70 baffle 12, as shown in Figure 1. A lighting element 14 is mounted upon the casing 5 and is in communication with the interior of the casing. A series of heating burners 15 is disposed upon the upper surface of the re- 75 tort and in communication with the compartment 2, see Figure 5. A shield 16 is disposed transversely upon the burners 15 and encloses the lighting element 14. The shield 16 is provided with any suitable refractory 80 material 17 at that end associated with the heating element 14.

One end of the retort is open at 18 and is closed by means of a plate 19. Feed tubes 20 and 21 are supported by the plate 19 and 85 extend into the interior of the compartments 4 and 3, respectively. Each of these tubes is formed upwardly at 22, as shown in Figure 1. The retort is provided with an extended portion 23 having a partition 24 dis- 90 posed in longitudinal alignment with the wall 25 between the compartments 3 and 4. The partition 24 may be termed a wind splitter. The partition 24 provides passageways 26 and 27, see Figure 3. A suitable butterfly 95 valve 28 is disposed within the passageway 27 for regulating the air passing there-through.

In Figure 6 we have shown a proposed installation. The extended portion 23 is con- 100

ected with a suitable fan 29. The fan 29 is operatively connected with a motor M. The feed pipe 21 is connected with a constant level tank 30. The tank 30 is connected with  
5 a supply tank 31 by means of a pipe 32. A primary solenoid 33 is disposed upon the feed pipe 21 adjacent a valve 34. The feed pipe 20 is also connected with the tank 30.  
10 The pipe 20 is provided with a meter valve 36 and a secondary solenoid 37. The solenoid 37 is operatively connected with a thermostat 38 by means of conductors 39 and 40.

The thermostat 38 is disposed within the living quarters and is adapted to make and  
15 break a circuit for actuating the solenoid 37. The primary solenoid 33 is electrically connected with the motor M by means of conductors 41 and 42. Starting the motor M will immediately actuate the solenoid 33,  
20 whereupon the feed line 21 is opened through the solenoid. Similarly, when the thermostat 38 reaches a certain temperature, the solenoid 37 will cut off the passage of fuel from the constant level supply to the retort.

25 A generating burner 43 is disposed underneath the retort, as shown in Figure 1. The generating burner is U-shaped, as shown in Figure 4, and is in communication with the interior of the casing 5. The compartments  
30 3 and 4 may be connected with the gas main in a building by means of tubes 44, as shown in Figure 1.

From the foregoing description of the various parts of the device, the operation  
25 thereof may be readily understood. The secondary compartment 2 is associated with the series of burners 15 for heating purposes. The primary compartment 3 provides means for continuing the generating  
40 burner 43 burning and also the lighting element 14 so that the burners 15 may be lit any time the solenoid 37 is opened for passing fuel through the feed line 20. When the motor M is started, the fan 29 will be actuated,  
45 which will cause air to pass through the extended portion 23 and through the primary and secondary compartments 3 and 4.

As soon as the motor is started, the primary solenoid 33 is opened for permitting  
50 the passage of fuel oil from the constant level 30, and, assuming that the valve 34 is open, the fuel oil will of course pass through the feed tube 21 and be deposited within the  
55 primary compartment 3.

We are assuming now that the generating burner 43 is lit, whereupon the bottom of the retort is heated sufficiently to convert the  
60 oil into gas. The gas thus generated will pass from the primary compartment 3 into the casing 5, be deflected and mixed by reason of the baffles 12 and 13, some passing downwardly and into the generating burner 43, and the rest passing upwardly and through the  
65 lighting element 14. The lighting element

14 is of course constantly burning. The amount of fuel oil entering the primary compartment 3 is regulated so that just enough is generated into gas to provide sufficient heat  
70 underneath the retort for generating purposes and also for continuing the burning of the lighting element 14.

When it is desired to light the burners 15, the fuel oil from the constant level is permitted to pass the valve 36 and will thereupon be conveyed by the feed tube 20 to the  
75 compartment 4. When the oil from the tube drops upon the bottom of the retort, it will be generated into gas and will pass in the direction of the curved surface 11 upwardly through the opening 10 into the compartment  
80 1, spread throughout the entire compartment, be forced through the opening 9, spreading throughout the entire compartment 2, and then passing uniformly through each of the burners 15. As soon as the gas passes  
85 through the burners 15, a certain amount is gathered underneath the shield 16. This gas will become ignited by reason of the lighting element 14 and the refractory material 17  
90 which is kept at an intense heat, whereby each of the burners 15 will become ignited.

When the temperature in the room in which the thermostat 38 is located reaches a predetermined degree, the thermostat will close  
95 the circuit through the solenoid for closing the feed tube 20, thereby extinguishing the burners 15. The generating burner 43 continues to burn, and when the feed tube 20 is again opened, the burner 15 will be again lit  
100 as previously described. Due to the fact that our burners 15 may be entirely extinguished, and because of the fact that the generating burner 43 can be easily set to burn at a specified flame independently of the burners  
105 15 and is adapted to generate sufficient heat to thoroughly gasify the oil flowing into the primary and secondary compartments 3 and 4, it will be seen that we have provided a device in which the accumulation of carbon  
110 is reduced to a minimum. Further than this, we have eliminated the necessity of continuing the burning of the heating burners 15. The fact that the burners 15 may be entirely  
115 extinguished is an important feature, since in devices of a similar type in which the burners 15 are regulated for burning more or less fuel for the purpose of regulating the temperature within the room, such burners are not efficient because of the fact that when  
120 the weather is relatively warm, the continued burning of the burners 15 will result in too much heat.

Should it at any time be desired to gain access to the interior of the primary and  
125 secondary compartments 3 and 4, this may be readily attained by removing the plates 8. The amount of forced air passing into the primary compartment 3 may be regulated by means of the butterfly valve 28. In order to  
130

provide a convenient means for heating the retort sufficiently in the first instance, we have provided the tubes 44 for conveying gas into the retort.

It will be observed that since the pipes 20 and 21 are formed as shown at 22, the discharge of the oil from these pipes will stop immediately in the event that the power should be turned off and the fan stopped during the process of forcing air into the retort. It frequently happens that, where there is a lack of air in the retort and a flow of oil continues therein, backfire occurs. Our construction is such, however, that the oil is prevented from continuing to drip into the retort, thereby eliminating the danger of backfiring.

We claim:

1. An oil gas burner comprising a retort provided with a primary generating compartment and a secondary generating compartment, means for feeding fuel oil to said compartment, a generating burner, a lighting element, casing means associated with the retort and communicating with said primary generating compartment, said casing being provided with baffle means for mixing and deflecting gases entering therein from said primary generating compartment, said casing being in communication with said lighting element and said generating burner, and a heating burner having communication with said secondary generating compartment.

2. An oil gas burner comprising a retort provided with a primary generating compartment and a secondary generating compartment, means for feeding fuel oil to said compartments, a generating burner, a lighting element, casing means associated with the retort and communicating with said primary generating compartment, said casing being provided with baffle means for mixing and deflecting gases entering therein from said primary generating compartment, said casing being in communication with said lighting element and said generating burner, and a series of burners carried by the retort and communicating with said secondary generating compartment.

3. An oil gas burner comprising a retort provided with a primary generating compartment and a secondary generating compartment, means for feeding fuel oil to said compartments, a generating burner, a lighting element, casing means associated with the retort and communicating with said primary generating compartment said casing being provided with baffle means for mixing and deflecting gases entering therein from said primary generating compartment, said casing being in communication with said lighting element and said generating burner, a series of burners carried by the retort and communicating with said secondary generating compartment, and means for automat-

ically cutting off the flow of fuel oil to said secondary generating compartment.

4. An oil gas burner comprising a retort provided with a primary generating compartment and a secondary generating compartment and a plurality of compartments, one of said plurality of compartments having communication with said secondary generating compartment, said plurality of compartments having communication with each other, a series of burners carried by the retort and having communication with one of said plurality of compartments, and a generating burner disposed in operative relation with the retort and having communication with said primary generating compartment.

5. An oil gas burner comprising a retort provided with a primary generating compartment and a secondary generating compartment and a plurality of compartments, one of said plurality of compartments having communication with said secondary generating compartment, said plurality of compartments having communication with each other, a series of burners carried by the retort and having communication with one of said plurality of compartments, a generating burner disposed in operative relation with the retort and having communication with said primary generating compartment, and a lighting element having communication with said primary generating compartment.

6. An oil gas burner comprising a retort provided with a primary generating compartment and a secondary generating compartment and a plurality of compartments, one of said plurality of compartments having communication with said secondary generating compartment, said plurality of compartments having communication with each other, a series of burners carried by the retort and having communication with one of said plurality of compartments, a generating burner disposed in operative relation with the retort and having communication with said primary generating compartment, a lighting element having communication with said primary generating compartment, and shield means associated with said lighting element and said series of burners.

7. An oil gas burner comprising a retort provided with a primary generating compartment and a secondary generating compartment and a plurality of compartments, one of said plurality of compartments having communication with said secondary generating compartment, said plurality of compartments having communication with each other, a series of burners carried by the retort and having communication with one of said plurality of compartments, a generating burner disposed in operative relation with the retort and having communication with said primary generating compartment, a

lighting element having communication with said primary generating compartment, shield means associated with said lighting element and said series of burners, and means for forcing air through said primary generating compartment and said secondary generating compartment.

8. An oil gas burner comprising a retort provided with a primary generating compartment and a secondary generating compartment and a plurality of compartments, one of said plurality of compartments having communication with said secondary generating compartment, said plurality of compartments having communication with each other, a series of burners carried by the retort and having communication with one of said plurality of compartments, a generating burner disposed in operative relation with the retort and having communication with said primary generating compartment, a lighting element having communication with said primary generating compartment, shield means associated with said lighting element and said series of burners, means for forcing air through said primary generating compartment and said secondary generating compartment, and means for supplying oil to said last named compartments.

Signed at Red Oak, in the county of Montgomery and State of Iowa, this 11th day of September, A. D. 1928.

GEORGE MILLER KERRIHARD.  
MAXWELL LATIMER KERRIHARD.