R. C. CASAD.

OIL BURNER.

APPLICATION FILED APR. 2, 1909.

962,695.

Patented June 28, 1910.

Fig. 1.

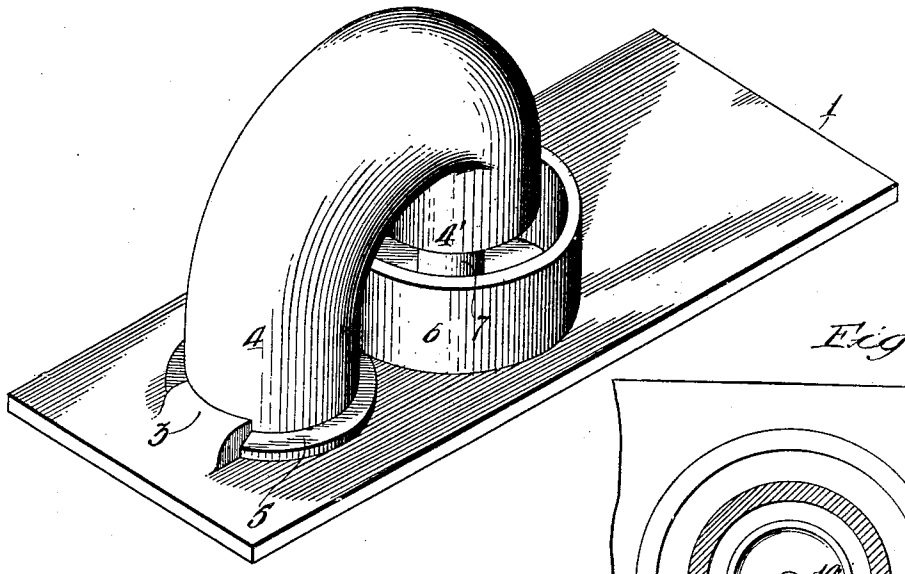


Fig. 3.

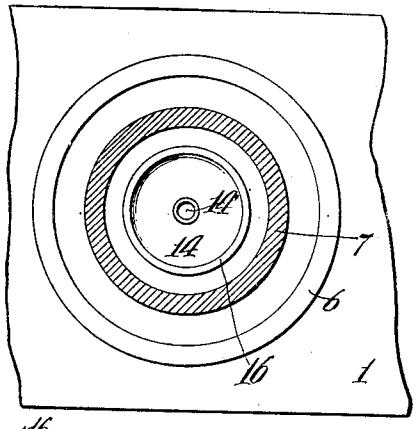
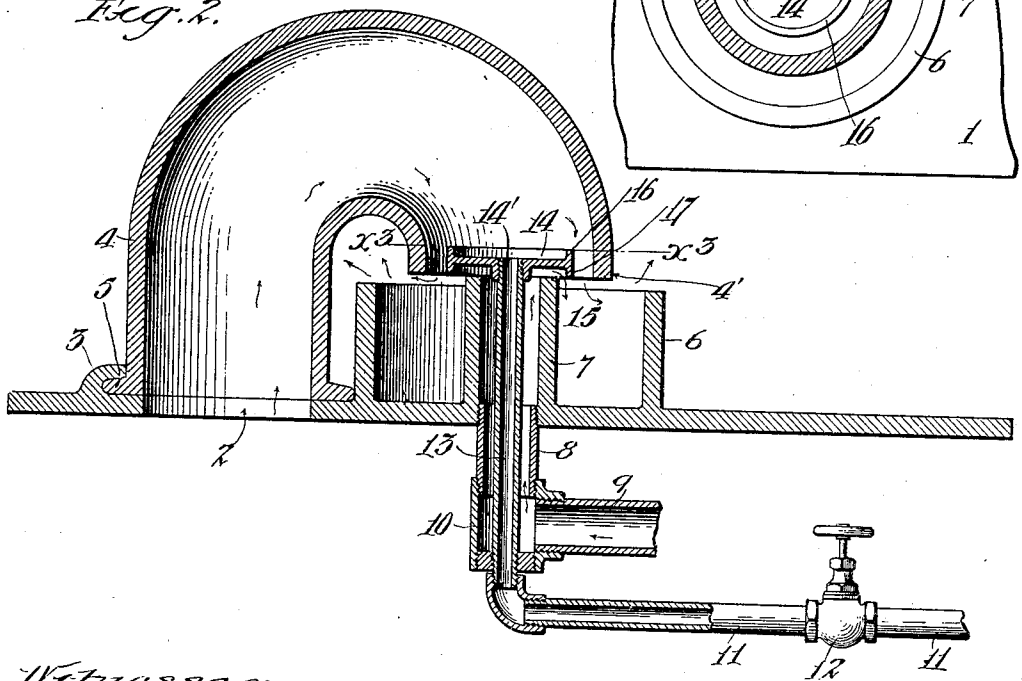


Fig. 2.



Witnesses:-

Louise A. Gratz.

Frank L. Markham

Inventor

Roland C. Casad

by Townsend Lyon & Hackley

his attys.

UNITED STATES PATENT OFFICE.

ROLAND C. CASAD, OF COVINA, CALIFORNIA.

OIL-BURNER.

962,695. Specification of Letters Patent. **Patented June 28, 1910.**

Application filed April 2, 1909. Serial No. 487,588.

To all whom it may concern:

Be it known that I, ROLAND C. CASAD, a citizen of the United States, residing at Covina, in the county of Los Angeles and State of California, have invented a new and useful Oil-Burner, of which the following is a specification.

The main object of the present invention is to provide an oil burner which will burn the oil in the most efficient and economical manner with a flame of extremely high temperature and with substantially no production of soot.

The invention is specially applicable to oil burners for use in connection with stoves and is of the type wherein an intercepting plate is placed across the grate space of the fire box and a natural draft is produced by the ordinary chimney connections of the stove through a tubular member communicating with the space below and above said intercepting plate, the nozzle of the oil burner being located at or near the outlet of this tubular member.

A further object of the invention in connection with such a burner is to provide for minimizing or eliminating the obstruction to the draft due to the presence of the burner nozzle in this tubular passage.

A further object of the invention in this connection is to insure that the oil vapor is mixed with air before combustion so that the combustion is of a mixture of vapor and air, giving a smokeless flame in distinction to unmixed oil vapor burning alone, which would burn with a smoky flame.

The accompanying drawings illustrate the invention and referring thereto: Figure 1 is a perspective of the burner. Fig. 2 is a vertical section thereof. Fig. 3 is a horizontal section on the line x^3 x^3 in Fig. 2.

1 designates the intercepting plate which is placed at the bottom of the fire pot or in the grate space of an ordinary stove in the usual manner in such devices. Said plate is provided with an opening or perforation 2 and at one side of said perforation with a lug 3. A tubular member 4 rests on the plate 1 and is secured thereon by engagement of its flange 5 under the lug 3, the bore of the tubular member 4 registering with the opening 2 of the plate 1. Said tubular member 4 is formed as an inverted U or double elbow having an upward ingress passage communicating with the opening 2 and a semicircular bend extending from the top of this vertical portion and bending over and down to the outlet portion 4′ which is directed downwardly and is situated a short distance above the plate 1. Said plate 1 is further provided with a wall 6 extending upwardly therefrom to a height a little below the level of the bottom of the outlet 4′, the space within this wall serving as a mixture and combustion chamber. Centrally within the wall 6 the member 1 is provided with an upwardly extending tubular post 7 whose upper end may be substantially on a level with the bottom of the outlet member 4′ of the tubular member 4. A nipple 8 is secured into this tubular member 7 and a pipe 9 connected to said nipple 8 by a fitting 10 serves to supply water or air.

The oil supply means 11 consists of a pipe connected to any suitable source of oil supply and provided with a valve 12 and a pipe 13 connected to said pipe 11 and extending upwardly within the tubular member 7 and provided at its upper end with a head 14 formed as a screw disk screwing onto the pipe 13 and having a recess 14′ in its top serving as an oil cup, and an annular recess 15 in its bottom extending over the top of the tubular member 7 to form an annular discharge slot for air or other fluid between the top of the member 7 and the bottom of member 14. The outer edge or rim of member 14 forms up-turned and down-turned flanges 16, 17 serving respectively as a lip over which the oil flows and as a deflector for the current of air issuing from the tubular member 7.

The pipe 9 may be open to receive atmospheric air or it may lead to any suitable source of water supply, for example, an ordinary service pipe supplying water under pressure. The head 14 is of larger diameter than the tubular member 7 and of less diameter than the air outlet of the tubular member 4, and the outer flange or wall 6 is of larger diameter than said air outlet.

The operation is as follows: The oil which may, for example be distillate or other hydro-carbon, is supplied through pipe 11, turned on at valve 12 and is lighted at the outlet where it flows over the lip

of the oil cup 14. As soon as the stove becomes warm the resulting draft from the chimney draws air through the tubular member 4, as indicated by the arrows, and causes a strong draft around the head 14 tending to vaporize the oil and mix it with the air. This draft in conjunction with the obstruction produced by the head 14 produces a condition of suction directly beneath said head and unless means are provided for relieving this condition it is found that the oil produces a yellow flame. Assuming that the tubular member 7 is open to communication with the air below the plate member 1, air will flow upwardly through this tubular member and outwardly over the top of this tubular member and below the deflector 14, thus relieving the condition of suction at this point and allowing the flame to expand freely under the natural draft, the flame then passing over the wall 6 of the combustion chamber in a circular sheet or jet having maximum velocity and giving a white flame of extremely high temperature and substantially without smoke. It will be understood that in case air is admitted as stated the supply of air to the underside of the flame is also of advantage in promoting combustion.

Another important advantage of admission of fluid through the tubular member 7 back of or below the obstruction 14 is that it serves to keep the oil pipe 13 and head 14 cool and by its contact with these parts and with the oil and oil vapor insures that the oil vapor will be mixed with the air to form a smokeless burning mixture before it reaches the temperature for ignition. That this is an important feature of the operation is shown by the fact that equally efficient results are obtained when the tubular member 7 is connected to the water supply as by means of pipe 9. In that case the water is turned on in limited amount, so that the head of the tubular member 7 and adjacent parts convert the water into steam before it reaches the outlet at the top of tubular member 7, the resulting expansive fluid serving to relieve the condition of suction at the bottom of member 14 and also to prevent the parts from becoming overheated to an extent sufficient to cause the oil burner to burn as such before its admixture with the air.

What I claim is:

1. An oil burner comprising a plate formed with two openings, a bent tubular member having one end communicating with one of said openings to receive air from beneath the plate and having the other end directed downwardly above the plate to form an air outlet, an oil supply pipe extending through the other of said openings in the plate, a head formed with an oil cup at the upper end of said oil supply pipe and communicating therewith, said head extending within said air outlet and being of greater diameter than said oil supply pipe, and a second tubular member surrounding said oil supply pipe and extending beneath said oil cup, said second tubular member communicating with said other opening in the said plate to receive elastic fluid therethrough, whereby said elastic fluid is directed at the inside of the oil or vapor passing from the oil cup and the air from the aforesaid air outlet is directed at the outside of said vapor.

2. An oil burner comprising a plate formed with two openings, a bent tubular member having one end communicating with one of said openings to receive air from beneath the plate and having the other end directed downwardly above the plate to form an air outlet, an oil supply pipe extending through the other of said openings in the plate, a head formed with an oil cup at the upper end of said oil supply pipe and communicating therewith, said head extending within said air outlet and being of greater diameter than said oil supply pipe, a second tubular member surrounding said oil supply pipe and extending beneath said oil cup, said second tubular member communicating with said other opening in the said plate to receive elastic fluid therethrough, whereby said elastic fluid is directed at the inside of the oil or vapor passing from the oil cup and the air from the aforesaid air outlet is directed at the outside of said vapor, and a wall extending upwardly from said plate around the aforesaid tubular member, said wall being of greater diameter than the aforesaid air outlet.

3. An oil burner comprising a plate formed with two openings, a bent tubular member having one end communicating with one of said openings to receive air from beneath the plate and having the other end directed downwardly above the plate to form an air outlet, an oil supply pipe extending through the other of said openings in the plate, a head formed with an oil cup at the upper end of said oil supply pipe and communicating therewith, said head extending within said air outlet and being of greater diameter than said oil supply pipe, a second tubular member surrounding said oil supply pipe and extending beneath said oil cup, said second tubular member communicating with said other opening in the said plate to receive elastic fluid therethrough, whereby said elastic fluid is directed at the inside of the oil or vapor passing from the oil cup and the air from the aforesaid air outlet is directed at the outside of said va-

por, and means for supplying water to the aforesaid tubular member to produce steam at the outlet of said member, said oil cup having an annular recess in its bottom extending over the top of said second tubular member to form an annular discharge slot.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 26th day of March 1909.

ROLAND C. CASAD.

In presence of—
F. M. TOWNSEND,
W. LARGE.