

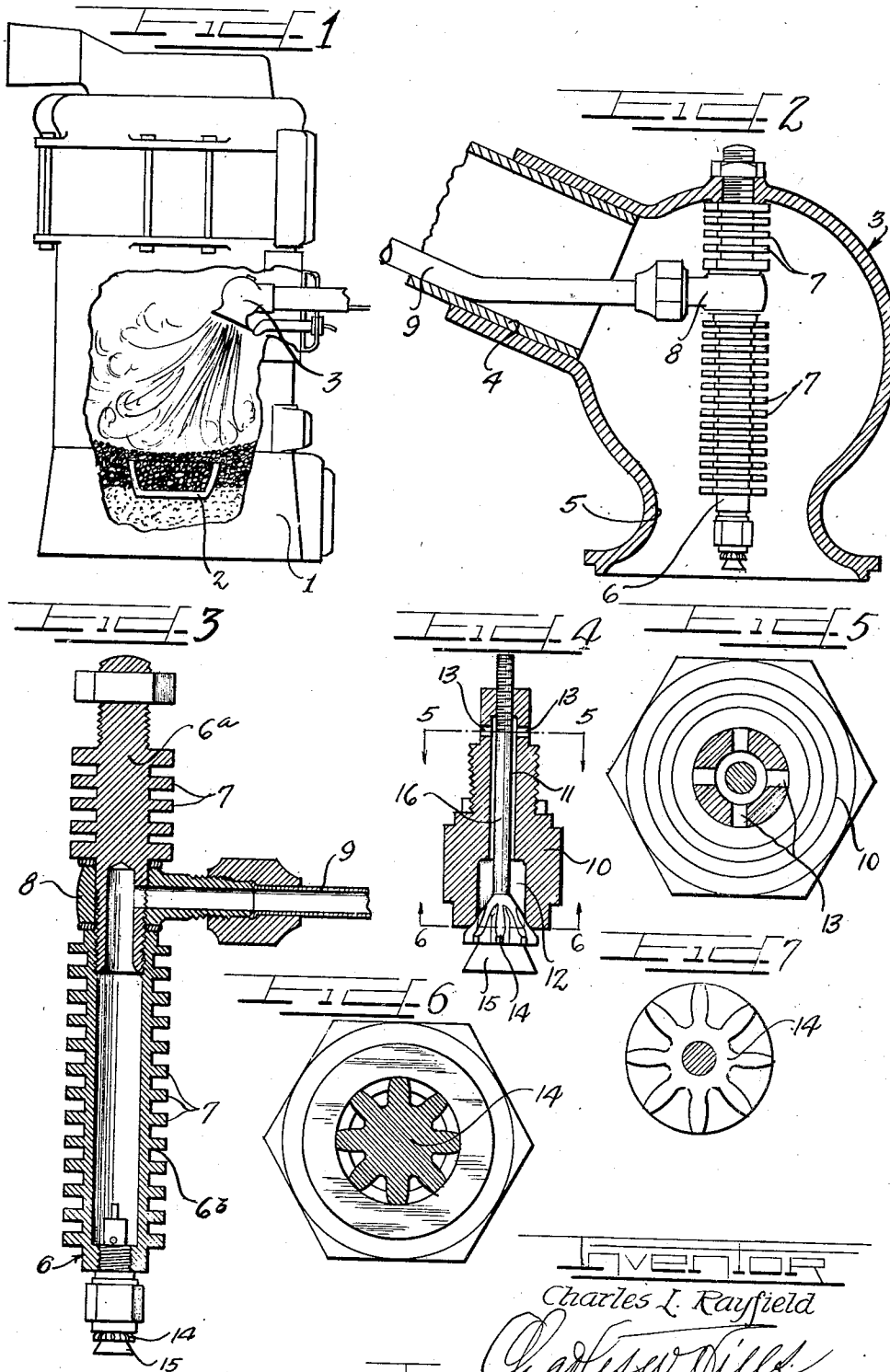
Oct. 28, 1930.

C. L. RAYFIELD

1,779,680

OIL BURNER

Filed Nov. 3, 1924



INVENTOR
Charles L. Rayfield

By *Charles L. Rayfield*
ALIVE

UNITED STATES PATENT OFFICE

CHARLES L. RAYFIELD, OF CHICAGO, ILLINOIS, ASSIGNOR TO RAYFIELD MANUFACTURING COMPANY, A CORPORATION OF ILLINOIS

OIL BURNER

Application filed November 3, 1924. Serial No. 747,501.

This invention relates to an oil burner especially adapted for use in connection with furnaces or the like.

It is an object of this invention to provide an oil burner in which liquid fuel is not preheated, but on the contrary is maintained more or less cool in order to prevent carbonization at the exit of the burner and from which the flame emerges in a conical or flaring manner.

It is a further object of this invention to provide means for catching and consuming any surplus or dripping of liquid fuel.

With these and other objects in view which will become more apparent in the following description and disclosures this invention comprises the novel structure and combinations hereinafter described and more particularly pointed out and defined in the appended claims.

In the accompanying drawings which illustrate a preferred embodiment of this invention and in which similar reference numerals refer to similar features in the different views.

On the drawings:

Figure 1 is an elevational view of a burner, partly broken away to show my improved burner therein.

Figure 2 is a sectional view through the burner showing parts in elevation.

Figure 3 is a vertical section through the oil feeding nozzle with parts in elevation.

Figure 4 is an enlarged sectional view of a removable plug constituting the lower end of the nozzle with the spraying tip in elevation.

Figure 5 is an enlarged view up the line 5—5 of Figure 4.

Figure 6 is an enlarged part elevational and part sectional view upon the line 6—6 of Figure 4.

Figure 7 is a top plan view of the spraying tip or member.

Referring to the drawings, it will be observed that there is illustrated a furnace 1 into which the oil burner projects through a suitable opening. A crucible 2 is embedded in crushed brick or the like in the bottom of the furnace and serves as a catch basin for

heavy particles of oil or the like. As the crushed brick is usually glowing during the operation of the burner, the fuel deposits in the crucible 2 will be ignited and will be consumed.

The fuel burner comprises a hollow globe-like casing 3 supported upon the end of an air supply pipe 4. The casing has a restricted opening or venturi 5 at its lower end. The fuel nozzle 6 is supported within the globe-like casing by being threaded in the upper end thereof, and extends beyond the venturi.

The fuel nozzle consists of an upper section 6^a and a lower section 6^b which have a threaded union, and which have heat radiating fins 7. A hub 8 surrounds a portion of the upper section 6^a; a hollow externally threaded shank integral with the hub communicates with the interior of the nozzle. A fuel supply pipe 9 which carries a fuel mixture of properly proportioned oil and air and extends through the air pipe 4, is connected to said shank. The fuel supply pipe 9 may be supplied with this fuel mixture of oil and air from any suitable mixing chamber or apparatus.

A hollow plug 10 is threaded in the lower end of the nozzle. The inner end of the plug has a threaded bore which emerges into a slightly enlarged passage 11 which in turn merges into an enlarged bore or channel 12. A plurality of fuel outlet ports 13 in the upper end of the plug communicate with the passage 11 whereby the fuel may escape from the nozzle. A conical spraying producing tip 14 having a toothed surface projects into the chamber 12. This tip will break up and thoroughly atomize the fuel and cause a spraying action. A conical flame deflector 15 extends coaxially of the tip 14, and is positioned therebelow. A rod 16 smaller than the passage 11 and threaded in the upper threaded base of the plug 10 supports the tip 14 and deflector 15. This rod 16 can be easily unscrewed and removed when it is desired to clean or renew the spraying tip 14.

It will be appreciated that the suspended nozzle over the fire pot will force the burning vapor downwardly to the crucible and fire

brick heating the same to incandescence, the flames will be deflected to the sides and rise along the wall before the generated heat escapes through the flues. In this way, the flame travels twice the usual distance in the fire box and completing perfect combustion before reaching the flues. It will also be appreciated that the nozzle is air cooled through the blast of air acting on the heat radiating fins so that in connection with the complete combustion afforded, no objectionable carbonization will occur. It will also be noted that the venturi will spread the air blast before it strikes the fuel. And on account of the conical tip of the burner the fuel will be spread out into a flaring or conical form, whereby the same becomes thoroughly mixed with the air greatly aiding combustion thereby.

Because of the provision of a venturi around the nozzle, which in itself carries a mixture of oil and air, there is in effect a double atomization which results in a highly combustible fuel mixture.

I am aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

I claim as my invention:

1. In combination, an air tube having one end terminating in a hollow globe-like nozzle disposed at an angle to the tube, a liquid supply line extending through said tube into said nozzle, a liquid projecting member having one end connected to the wall of said nozzle and having its other end terminating in the discharge orifice of said nozzle, a connection between said end of the supply line and an intermediate portion of said projecting member, and a tubular plug detachably mounted in the discharge end of said projecting member including a conical element disposed in one end of said plug and cooperating with said plug to define a ring-like opening through which the liquid is discharged.

2. In an oil burner, a hollow globular casing forming therein an air passage and having a lower discharge opening and a constricted portion immediately above its discharge opening forming a venturi, the wall of said casing being flared abruptly from its constricted portion to said opening, and a fuel nozzle diametrically within said casing, having a fuel spreading member at its discharge end below the venturi and within said flaring discharge opening.

3. In a burner, an air tube, a casing to which said tube leads having the hollow globe-like form provided with a discharge opening at one side, a nozzle in said casing having its discharge end in said opening and having its opposite end in threaded connection with the wall of the casing diametrically opposite to said opening, a fluid supply pipe extending into the casing through said air tube, said nozzle being in two aligned sections, and a coupling between the fluid pipe and the nozzle detachably engaged by the sections of the nozzle whereby the latter may be separately removed from the casing through its discharge opening.

In testimony whereof I have hereunto subscribed my name.

CHARLES L. RAYFIELD.