

E. E. COMSTOCK.
CRUDE OIL BURNER.
APPLICATION FILED DEC. 22, 1913.

1,098,884.

Patented June 2, 1914.

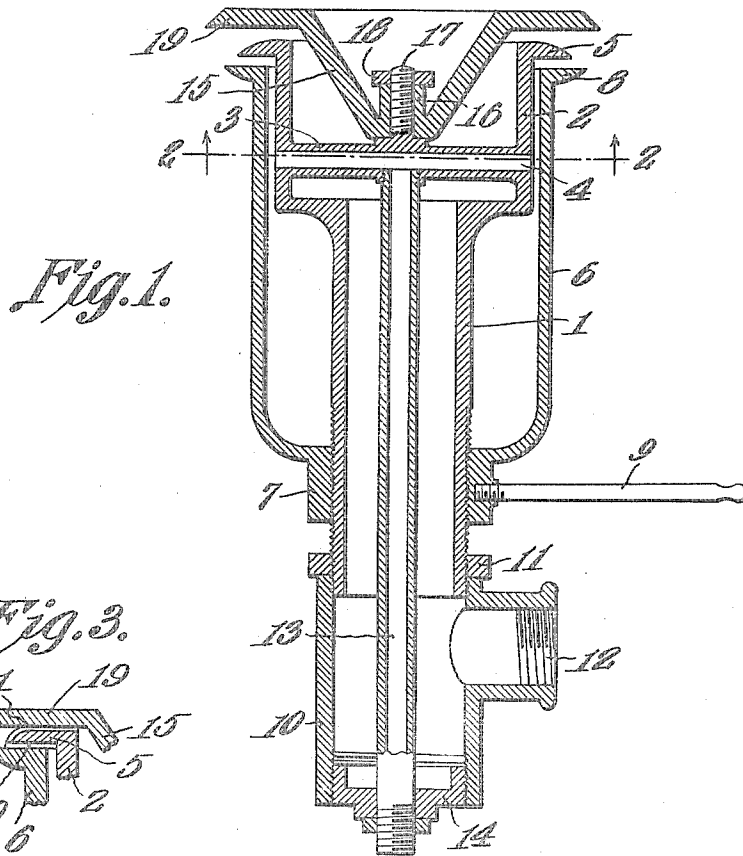


Fig. 1.

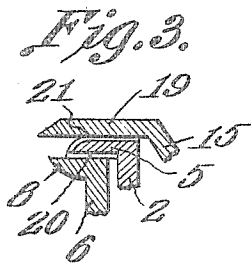


Fig. 3.

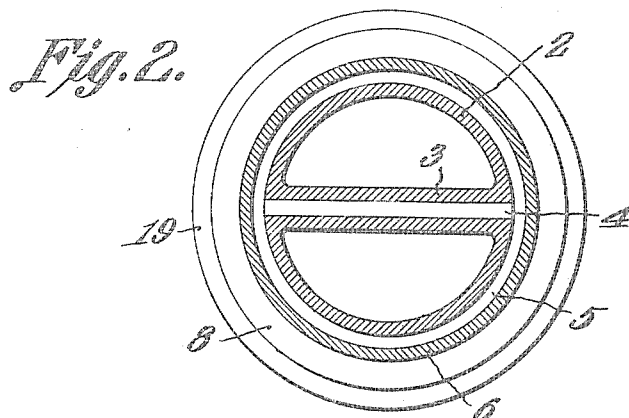


Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

ELMER EUGENE COMSTOCK, OF FRESNO, CALIFORNIA.

CRUDE-OIL BURNER.

1,098,884.

Specification of Letters Patent.

Patented June 2, 1914.

Application filed December 22, 1913. Serial No. 808,235.

To all whom it may concern:

Be it known that I, ELMER E. COMSTOCK, a citizen of the United States, residing at Fresno, in the county of Fresno and State of California, have invented a new and useful Crude-Oil Burner, of which the following is a specification.

The present invention appertains to hydro-carbon burners, and is particularly an improvement over my former Patent No. 1,077,123, issued October 28, 1913.

It is the object of the present invention, to provide a hydro-carbon burner of the type disclosed in the said patent, which shall embody certain improvements to better adapt it for the purposes intended.

With the foregoing and other objects in view, which will be apparent as the nature of the invention is better understood, the present invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention has been illustrated in its preferred embodiment in the accompanying drawing, wherein:—

Figure 1 is a vertical or longitudinal section of the improved hydro-carbon burner. Fig. 2 is a cross section thereof, taken on the line 2—2 of Fig. 1. Fig. 3 is a sectional detail of a modification.

In carrying out the present invention, there is provided a casting including the vertical oil or fuel pipe 1, having the integral cup 2 at its upper end. The cup 2 is provided with an integral bridge portion 3 disposed diametrically therein and terminally attached to opposite walls of the cup, the bridge portion 3 spanning the bottom of the cup and the upper end of the pipe 1. A diametrical bore 4 is drilled through the bridge portion 3. The rim or edge of the cup 2 is provided with an outstanding or horizontal flange or lip 5 having its periphery beveled.

A steam or atomizing fluid cup 6 surrounds the oil or fuel cup, and has its bottom formed with a hub or boss 7 threaded upon the fuel pipe 1, the edge or rim of the cup 6 having an outstanding or horizontal flange or lip 8 adjoining and complementing the flange or lip 5 of the fuel cup. The

steam or atomizing fluid cup 6 may be adjusted longitudinally upon the pipe 1, by means of a handle or lever 9 attached to the hub or boss 7, whereby the steam cup may be rotated or threaded upon the pipe 1, to move the flange 8 to or from the flange 5.

A T-coupling 10 has one end threaded over or engaged with the end of the fuel pipe 1, a jam nut 11 being preferably threaded upon the pipe 1 to bind against the said end of the coupling 10, to retain the coupling in position. The branch or arm 12 of the coupling is designed for attachment to any suitable source of liquid or hydro-carbon fuel, the fuel being preferably fed by gravity into and up the pipe 1, to the cup 2, although if desired, the fuel may be fed under pressure.

A steam or atomizing fluid pipe 13 is disposed concentrically or axially within the pipe 1, and has its upper end attached to the bridge portion 3, so as to communicate with the bore 4. The lower end of the steam pipe 13 passes through a plug or closure 14 engaged into the lower or free end of the coupling 10, whereby the lower end of the steam pipe 13 may be connected to a boiler, or other source of steam or atomizing fluid.

An inverted conical or funnel-shaped cap 15 is disposed within the mouth of the fuel cup 2 and is provided within its apex, with a hub or collar 16 mounted upon an integral upstanding stem 17 carried by the central portion of the bridge portion 3, a binding or jam nut 18 being threaded upon the extremity of the stem or finger 17 to lock the cap thereon. The rim of the cap 15 is provided with an outstanding or horizontal flange or lip 19 disposed directly above and complementing the flange or lip 5. The flange or lip 8 of the steam cup projects beyond the flange or lip 5 of the fuel cup, while the flange or lip 19 of the cap projects beyond both of the flanges 5 and 8.

The present burner is intended particularly for use in connection with upright and other steam boilers, but may be employed for divers other purposes, as need not be mentioned. When steam is admitted into the pipe 13, the same will be discharged through the ends of the bore 4, into the steam cup 6, and from the steam cup, the steam will be discharged to the atmosphere through the annular nozzle between the flanges 5 and 8. The liquid fuel or oil being admitted into the pipe 1, will flow into the cup 2, and the

cup 2 in being filled, will cause the fuel to overflow the flange or lip 5, to be atomized and vaporized by the steam, for producing a perfect and uniform combustible mixture.

5 In this manner, the steam or atomizing fluid will serve to atomize and spray the fuel, so as to produce a maximum heating effect with a minimum fuel supply and with a minimum amount of soot deposit.

10 By adjusting the steam cup 6 upon the pipe 1, the discharge of steam may be regulated to a nicety, and enables the operator to blow out any scale, dirt or extraneous matter lodged between the steam and fuel cups.

15 The present burner, may be employed successfully with a gravity feed of the fuel, it being unnecessary to force the fuel into the burner under pressure, although either method may be employed.

The steam pipe 13 passing through the oil pipe 1 and the bridge portion 3 being disposed within the oil cup, will serve as an effective means for heating the liquid fuel by the steam, in connection with the steam within the cup 6 surrounding the fuel cup 2. The heating of the fuel facilitates the perfect atomization of the fuel, as is apparent.

25 With the employment of the cap 15 as described and illustrated, it will be observed that the cap will be submerged in the fuel, whereby the cap will be prevented from being burnt by the flame, and furthermore, the fuel will rise effectively within the annular space between the sides of the cup 2 and the sides of the cap 15, whereby the effective overflow or discharge of fuel will be accomplished. The flange 19 projecting beyond the flanges 5 and 8 will prevent the natural air drafts from drawing the oil or fuel away from the steam, as would result in a poor combustion of the fuel.

40 The several parts of the burner may be readily assembled, and may be quickly separated for the purpose of repair, replacement or cleaning.

45 As illustrated in Fig. 3, the bottom of the flange or lip 5 may be provided with a radial slot 20 of any width, or extending through any suitable arc, and the top of the flange or lip 5 may be provided with a complementing radial slot 21 of slightly less width, or extending through a less arc than the slot 20. Thus, when the lips 8 and 19 of the outer or steam cup 6 and cap 15, respectively, are clamped against the lip 5 of the inner or oil cup 2, the steam may be discharged through the slot 20, while the oil or liquid fuel passes through the slot 21 to be atomized by the steam. In this manner, a relatively long or fan-shaped flame may be provided, according to the width or arcs of the slots 20 and 21. This arrangement is desirable when the flames are to be projected
50
55
60
65 in one direction, instead of issuing in all

directions. The oil or fuel slot 21 is preferably narrower than the slot 20 whereby the oil or fuel will not be wasted, as will be apparent.

Having thus described the invention, what is claimed as new is:—

1. A hydro-carbon burner embodying an outer atomizing fluid cup, an inner fuel cup having a rim flange above the rim of the outer cup, and an inverted conical cap disposed within the mouth of the inner cup.

2. A hydro-carbon burner embodying an outer atomizing fluid cup, an inner fuel cup having a rim flange above the rim of the outer cup, and an inverted conical cap disposed within the mouth of the inner cup and having a rim flange disposed above the aforesaid rim flange of the inner cup.

3. A hydro-carbon burner embodying inner and outer cups, supporting means disposed within the inner cup, and an inverted conical cap disposed within the mouth of the inner cup and having its apex attached to the said supporting means.

4. A hydro-carbon burner embodying inner and outer cups, the inner cup having a bridge portion therein, and an inverted conical cap disposed within the mouth of the inner cup and having its apex attached to the said bridge portion.

5. A hydro-carbon burner embodying inner and outer cups, the inner cup having a diametrical bridge portion provided with an upstanding stem, and an inverted conical cap disposed within the mouth of the inner cup and having a collar at its apex inserted over the said stem.

6. A hydro-carbon burner embodying inner and outer cups, the inner cup having a bridge portion provided with a bore therethrough, a fuel pipe attached to the inner cup, and an atomizing fluid pipe attached to the said bridge portion.

7. A hydro-carbon burner embodying a fuel pipe having a fuel cup at its upper end, the fuel cup having a bridge portion provided with a bore therethrough, an atomizing fluid cup mounted on the said cup and surrounding the fuel cup, and an atomizing-fluid supply pipe passing through the aforesaid pipe and attached to the said bridge portion.

8. A hydro-carbon burner embodying a fuel pipe having a fuel cup at its upper end, the fuel cup having a bridge portion provided with a bore therethrough, an atomizing fluid cup mounted on the said cup and surrounding the fuel cup, an atomizing fluid supply pipe passing through the aforesaid pipe and attached to the said bridge portion, and an inverted conical cap disposed within the mouth of the fuel cup and having its apex attached to the said bridge portion.

9. A hydro-carbon burner embodying an upright fuel pipe having a fuel cup at its

upper end, an atomizing fluid cup mounted
on the said pipe and surrounding the fuel
cup, a T-coupling having one end engaged
with the lower end of the said pipe, a plug
5 engaged in the other end of said coupling.
and an atomizing fluid supply pipe disposed
within the aforesaid pipe and passing
through the said plug, the atomizing fluid
supply pipe communicating with the atom-
10 izing fluid cup at its upper end, and the

branch of the said coupling being designed
for attachment to a source of fuel.

In testimony that I claim the foregoing
as my own, I have hereto affixed my signa-
ture in the presence of two witnesses.

ELMER EUGENE COMSTOCK.

Witnesses:

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B. S. ALMASARY.