

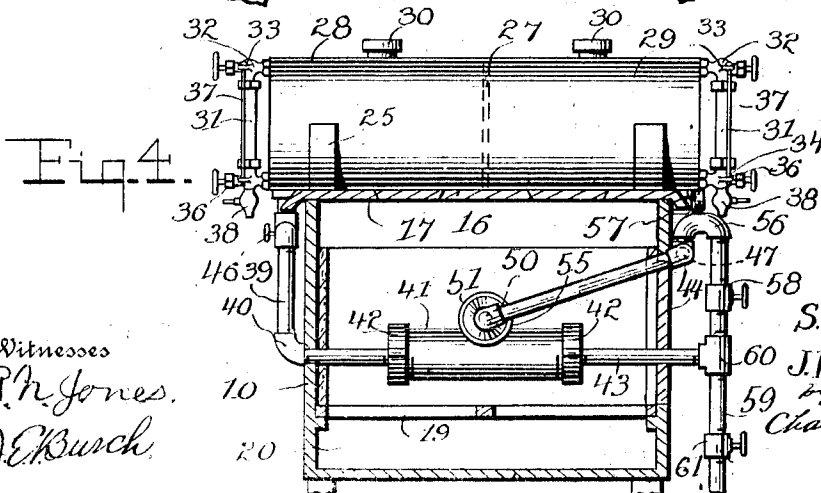
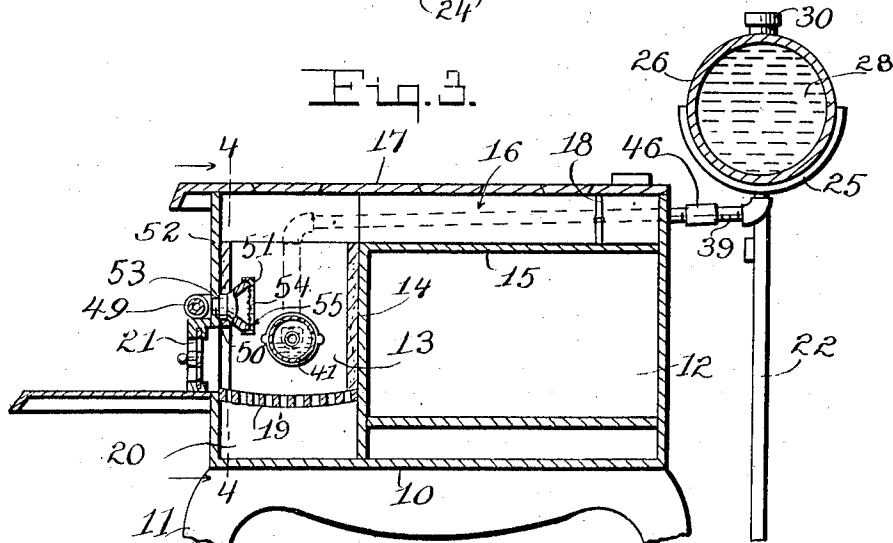
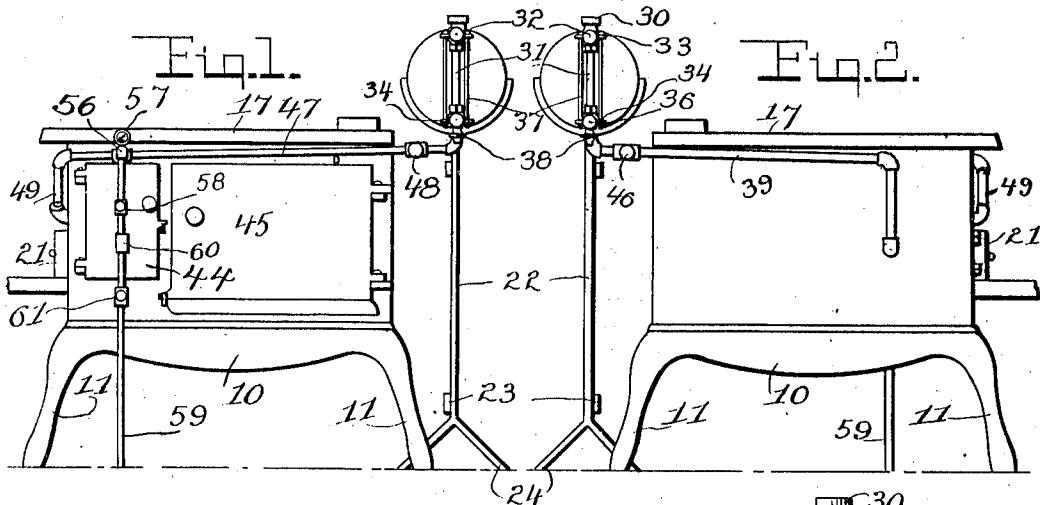
J. R. T. SMITH & S. DUTY.

CRUDE OIL BURNER.

APPLICATION FILED JUNE 6, 1912.

1,053,662.

Patented Feb. 18, 1913.



Witnesses  
R. H. Jones.  
J. E. Busch.

Inventors,  
S. Duty and  
J. R. T. Smith.  
Charles H. Chandler  
Attorneys

# UNITED STATES PATENT OFFICE.

JOHN R. T. SMITH AND SYLVESTER DUTY, OF STAMPS, ARKANSAS.

CRUDE-OIL BURNER.

1,053,662.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed June 5, 1912. Serial No. 701,895.

*To all whom it may concern:*

Be it known that we, JOHN R. T. SMITH and SYLVESTER DUTY, citizens of the United States, residing at Stamps, in the county of Lafayette, State of Arkansas, have invented certain new and useful Improvements in Crude-Oil Burners; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has special reference to crude oil burners and the primary object of the invention consists in providing a novel and efficient crude oil burning device or apparatus adapted for application to an ordinary wood or coal stove of the heating or cooking type, so as to burn crude oil and greatly reduce the cost of maintenance from that of a stove burning wood or coal as fuel.

Another object of the invention is to provide a crude oil burning apparatus in which water from a suitable tank is supplied to a water heater or steam generating pot for supplying a blast of steam to commingle with a supply of oil from a similar tank or reservoir, so that part of the carbon of the oil or liquid hydro-carbon will decompose the same to burn with better combustion and produce an intense heat for the use of the stove and also generate the water in the heater to steam for the continuous operation of the apparatus.

Another and important object of the invention consists in providing a novel arrangement of feed pipes controlling the supplies of each, the water and the oil, to provide means for ascertaining at all times, the height of the water and oil in the respective tanks, to determine the pressure of the steam and also regulate the supplies of steam to the burner supply pipe for oil whereby when the pressure becomes too great, independent escape of the steam may be accomplished to reduce such pressure and insure of the supply of the steam to the oil in the proper quantity.

A still further object of the invention consists in the provision of a burner nozzle capable of being arranged at varying angles relative to the water heater or steam generating pot and in which the burner nozzle is so constructed as to spread the flame or blast throughout the area of the fire box

whereby efficient heating qualities from a minimum amount of liquid fuel is obtained.

With the above and other objects in view, our invention will be more fully described, illustrated in the accompanying drawings which show a preferred embodiment of our device and then specifically pointed out in the claims which are attached to and form a part of this application.

In the drawings:—Figure 1 is a side elevation of a cook stove of the wood or coal burning type having our improved crude oil burner or apparatus attached thereto. Fig. 2 is an opposite side elevation thereof. Fig. 3 is an enlarged longitudinal sectional view through the stove and parts of the apparatus. Fig. 4 is a cross sectional view taken on the line 4—4 of Fig. 3 and looking in the direction indicated by the arrows.

In illustrating an embodiment of one application of the invention, there is disclosed a cook stove 10 of the coal or wood burning type, the same having the usual supporting legs 11 and embracing an oven 12 and a fire box 13. The oven and fire box are separated by the usual center wall or partition 14 and the top wall 15 of the oven forms a smoke flue or channel 16 with the top portion 17 of the stove while the draft is regulated by a turnable damper 18 in the usual manner. A grate 19 is mounted within the fire box and is arranged with an ash pit 20 therebeneath while a draft slide 21 is provided at the front end of the stove for regulating the supply of air to the fire box.

A bracket comprising spaced end members 22 and horizontal connecting members 23, is arranged at the rear end of the stove, the said end members having their lower ends formed with divergent legs 24 to support the bracket in a standing position. The upper ends of said end members are provided with curved or arcuate cross arms 25 for supporting a cylindrical tank 26 thereon and transversely of the rear end of the stove.

The tank or reservoir 26 is closed at its ends and provided with a central partition wall 27 to divide the tank into two compartments, being a water containing compartment 28 at one end and a crude oil containing compartment 29 at the other end. Each compartment is provided with a removable feed cap or plug 30 for supplying

the water and oil to the same and further provided at the ends of the tank with glass level gages 31 communicating at their upper ends with the interior of the compartments at the top portions thereof through valves 32, the casings of which are provided with apertured wings 33 for securing the glass cylinder of the gages to similar wings 34 carried by the casings or valves 36 communicating with the interior of the compartments at the bottom portions thereof. This attachment is made through a pair of connecting rods 37 connecting the respective wings of the valves and each lower valve is provided with a let-off or petcock 38 for draining the valves and gage tubes. It will also be observed that the tank or reservoir 26 is arranged above the top of the stove and adapted to supply the water and oil by gravity, the water being fed through a depending or slightly inclined feed pipe 39 which extends along the rear side of the stove near the top thereof and then through said wall and into the fire box 13 as shown at 40. The inner end of the pipe section 40 is connected to a water heater or steam generating pot 41 which comprises a cylindrical metallic casing or pipe section having caps 42 threaded on its ends and in turn coupled to or receiving the threaded end of the pipe section 40 and a discharge pipe section 43 which extends through the opposite side wall of the stove. In this instance, the pipe 43 is extended through a hinged door 44 at the end of the fire box adjacent to the oven door 45, but it is obvious that since the door remains closed during the use of the burner with the stove, any form of end wall will suffice. The supply of water through the pipe 39 may be properly regulated through the medium of a valve 46 situated near the water compartment so that when the valve is closed, the greater portion of the feed pipe will be drained by continued use of the burner.

An oil supply pipe 47 of less diameter than the pipe 39 for supplying water, depends from the oil containing compartment at the opposite end of the tank and is disposed in an inclined position at the front side of the stove above the oven door to similarly feed the oil, the supply of which may be regulated through the medium of a valve 48 also positioned adjacent to the tank and serving for a similar advantage as the relative position of the valve 46 to the tank. The lower or forward end of the pipe 47 is extended along the front end of the stove as shown at 49 and carries an inwardly extending burner pipe 50 having a burner nozzle 51 threaded on its free end. This burner pipe is disclosed as extending in an angular direction relative to the front end 52 of the fire box and at a tangent relative to the casing 41 and may be adjusted or turned up-

wardly or downwardly at any inclination desired through the medium of the threaded connection of the pipe section 49 with the feed pipe 47.

The burner nozzle 51 as illustrated, embodies an approximately frusto conical casing having cylindrical attaching portion 53 of reduced size and having its enlarged end engaged by a strainer or section of wire gauze 54 for dividing or scattering the flame or blast throughout the area of the fire box for securing the maximum heating qualities thereof. The strainer is retained on the burner casing or nozzle by means of a flanged ring 55 which is threaded on the casing and which thereby permits the renewal of the strainer or gauze section as desired.

The outer end of the discharge pipe 43 leading from the steam pot is connected to the oil supply pipe through the medium of an elbow joint 56 which is preferably horizontally disposed as illustrated in Fig. 4 of the drawings and which carries a steam pressure gage 57 to determine the pressure of the steam entering the oil pipe and permitting the convenient regulation of the discharge through the medium of a valve 58 interposed between the elbow joint and the discharge pipe for the steam. A drain pipe 59 extends downwardly from the three way joint 60 to which the valve 58 is connected and extends downwardly in contradistinction to the upward extent of the discharge leading to the oil pipe, while a valve 61 is mounted in the drain pipe for drawing steam from the steam pot to reduce the pressure while the valve 58 is either open or closed. The valve 58 is for the purpose of regulating the quantity of steam fed into the oil pipe for intermingling and heating the oil, which being in a crude state, is rendered considerably thinner and caused to flow more freely.

In the operation of the apparatus or burner, a combustible such as paper or shavings, is ignited beneath the steam pot or generator and the valves 46 and 48 are opened to admit the water and oil to the respective feed pipes, the flow through which they regulate and the water will fill the casing of said pot. This water will be generated into steam and by opening the valve 58, such steam will be discharged into the oil feeding pipe so as to commingle with the oil or hydrocarbon fluid and thus decompose the same to produce a large quantity of hydro-carbon gas. This gas will be discharged through the burner nozzle at a high pressure, forced by the supply of steam and being ignited, will be scattered in passing through the strainer or gauze to produce an intense heat throughout a greater portion of the area of the fire box. The nicety by which the feeding of the water, oil and steam, may be accomplished, greatly facilitates the operation of the apparatus or

burner and efficient results can be obtained at a very much decreased cost relative to the cost of maintenance of a wood or coal stove.

5 What we claim is:—

1. A burner for hydrocarbons comprising separate compartments for containing water and a liquid hydrocarbon, a steam generating pot having valved communication  
10 with the water supply compartment, a burner nozzle directed toward said pot, a supply member therefor having valved communication with the hydrocarbon contain-  
15 ing compartment for supplying the burner for generating steam in said pot and a valved communication between the pot and the hydrocarbon supply member for dis-  
20 charging steam thereinto distantly from the nozzle to commingle with the hydrocarbon for thinning the same and exuding from the nozzle in a blast.

2. A crude oil burner attachment for stoves embodying a bracket, a tank sup-  
ported on said bracket, said tank having  
25 separate water and crude oil containing compartments, a supply member for each compartment, a steam generator for arrange-  
ment within the stove, supply pipes detach-  
ably connected with the two compartments  
30 of the tank, one pipe being detachably connected to the generator for supplying water thereto, a burner nozzle having connection  
with the other pipe and supplied with oil  
35 therethrough and a steam pipe also detach-  
ably connected to the generator for dis-  
charging the steam into the oil pipe, said  
latter pipe having a drain.

3. A crude oil burner for stoves embrac-  
ing a water supply means, an oil supply  
40 means, a cylindrical steam generating pot disposed in the stove for receiving a supply  
of water, a horizontally arranged nozzle  
also disposed in the stove and connected  
with the oil supply means, said nozzle be-  
45 ing angularly adjustable relative to the pot  
and a valved connection between the pot and the oil supply means exteriorly of the stove  
for discharging steam generated in the pot  
into the oil supply means.

50 4. A crude oil burner embracing a water reservoir, an oil reservoir, means for de-

termining the height of the fluid in said  
reservoirs, a steam generator comprising a  
cylindrical casing and end caps secured  
thereto, means for supplying water from the  
55 reservoir to the generator through one cap,  
a burner nozzle, means for supplying oil  
from its reservoir to the nozzle and includ-  
ing a movable support for the nozzle, means  
for supplying steam from the generator  
60 through the other cap to the oil supply  
means to commingle with the oil on its  
travel and previous to its discharge from  
the nozzle and independent means for de-  
termining and regulating the pressure of  
65 the steam entering the oil supply means.

5. A crude oil burner comprising a steam  
generator connected with the water supply,  
a burner nozzle directed toward the gen-  
erator and having a spraying strainer, an  
70 oil supply means for the burner, said gen-  
erator having valved communication with  
the oil supply means to furnish steam to  
intermingle with the oil and force the same  
under pressure and a valved outlet for dis-  
75 charging the steam from the generator si-  
multaneously or independently with the  
feeding of the steam to the oil, to regulate  
the pressure of the steam and the strength  
80 of the blast.

6. In a crude oil burner, the combination  
with steam generating means; of an oil sup-  
ply pipe receiving a discharge of steam  
therefrom and a burner nozzle mounted on  
said pipe, said burner nozzle comprising a  
85 removable frusto-conical casing, a strainer  
mounted at the mouth of the casing and a  
flanged collar threaded on the casing to  
removably secure the strainer thereto.

In testimony whereof, we affix our signa-  
90 tures, in presence of two witnesses.

JOHN R. T. SMITH.  
SYLVESTER DUTY.

Witnesses to signature of John R. T.  
Smith:

WILLIE BRODIE,  
A. C. KELLY.

Witnesses to the signature of Sylvester  
Duty:

J. EDWIN BURCH,  
FRANCIS BOYLE.