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OIL GAS GENERATOR

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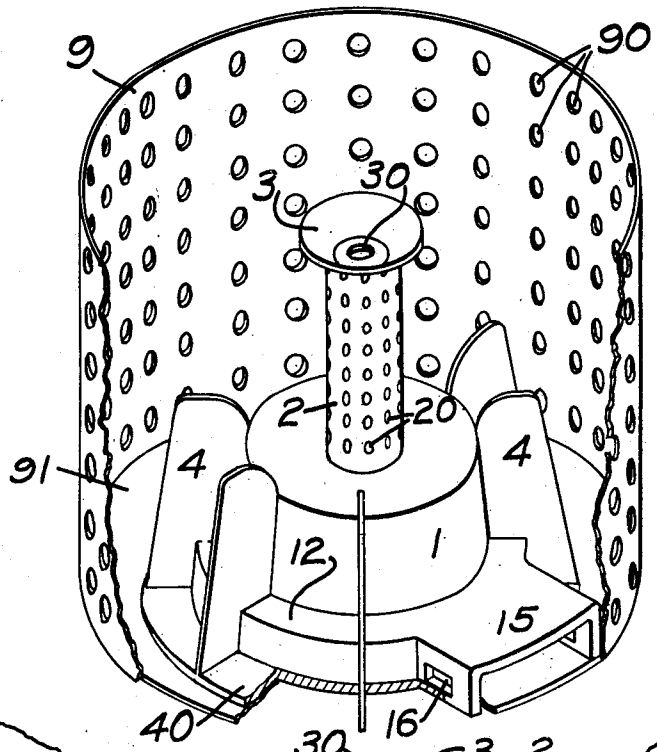


Fig. 1

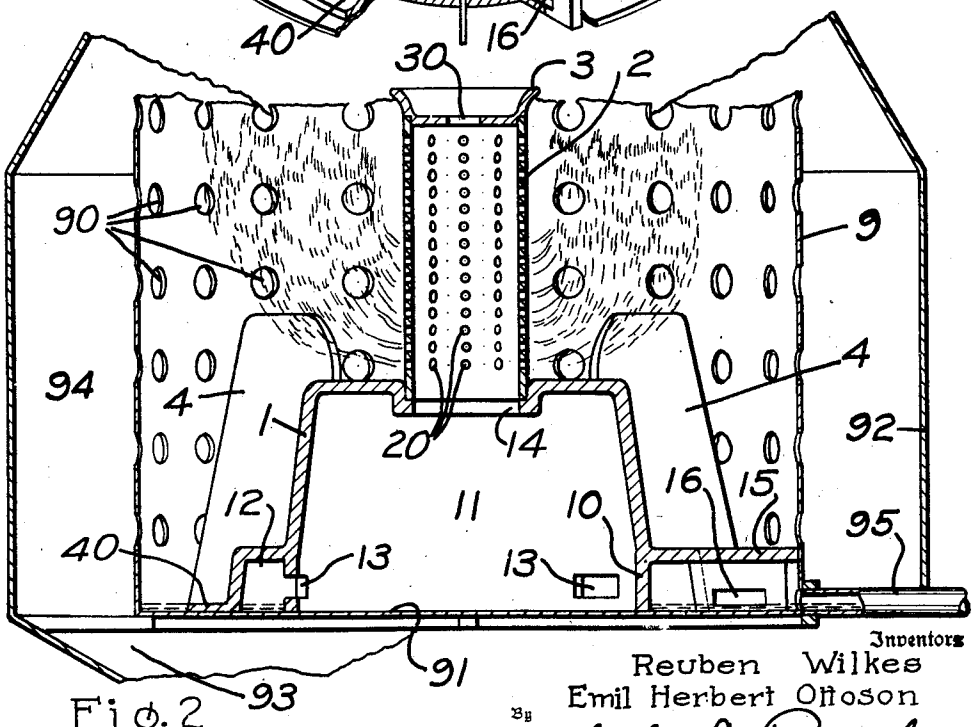


Fig. 2

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OIL GAS GENERATOR

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9 Claims. (Cl. 158—66)

Our invention relates to oil burners, generally such as are known as pot type burners.

Pot type burners comprise a metal pot, usually of sheet metal, with a top having an opening for the discharge of flames, and usually having perforations in its sides; oil is delivered to its bottom, and air under some pressure is delivered within a surrounding casing to enter the pot through the perforations in the side walls. The flame being started by ignition of oil upon the bottom, or other combustible material within the pot, oil gas is generated by the heat radiated from the flame within the pot, and in part by heat conducted through the walls of the pot to the oil upon the bottom, and thus the combustion continues. Such a burner is a very simple type, and inexpensive, and has come into general use for such reasons. It is, however, inefficient in that the oil is not thoroughly gasified, and the flame is a yellow flame, indicating imperfect combustion, and therefore loss of efficiency, and indeed imperfect combustion is further indicated by deposits of carbon in and about such burners, such deposits being characteristic of this type of burner.

It is an object of our invention to provide a generator which may be employed in such burners now in use, or which may be associated with such a burner, either removably or integrally, the better to generate gas from the oil, and to insure complete combustion. When employed in burners which are already sooted up, it will in a short time effect combustion and removal of carbon deposits.

It is another object to make such a generator for use in a pot type oil burner which may be readily adapted to any such type of burner now in use, or which may be incorporated in or supplied with new burners of the pot type.

It is a further object to provide such a generator which shall be simple and inexpensive in construction, and little subject to burning out or to destruction from other causes in use.

It is a further object to provide such a generator which has incorporated within it means to regulate the supply of oil and for disposing of an excess of oil without interfering with the proper operation of the generator.

With these and other objects in mind, as will appear hereafter, our invention comprises the novel generator, the novel combination thereof with a pot type burner, and the various parts of the generator, all as shown in the accompanying drawing and described in this specification, and as will be more particularly defined by the claims which terminate this specification.

In the accompanying drawing we have shown our invention embodied in a form such as is now preferred by us, and associated with a typical pot type burner.

Figure 1 is a perspective view, with parts broken away and shown in section, of the burner and generator disposed therein.

Figure 2 is an axial section through the generator, and through parts of the burner, illustrating the relationship of the parts in use.

The burner illustrated is only typical, and various forms of burner may be employed, and our generator will be found useful and desirable in conjunction with various types of burner. However, as shown herein, the burner consists of the pot 9 having perforations 90 in its side walls, and open at its top. It is shown herein as having a flat bottom 91. This pot is surrounded by an outer casing 92, which is closed except as provision is made at its bottom, as indicated at 93, for admission of air under pressure from any suitable source, as is common in the art. This pressure, entering the space 94 between the pot 9 and the casing 92, can only escape through the apertures 90, and thus assists in the combustion of the oil gas which is generated within the pot. Oil for combustion is supplied by a pipe 95 entering the bottom of the pot 9 to spread over its bottom 91. As indicated above, such a burner is only typical of many forms with which our generator is useful.

Usually the pot type burner consists of little, if anything, more than the arrangement just described. However, our burner includes a generator consisting of a metal hood 1, preferably a casting of sufficient thickness and mass to receive and conduct an appreciable amount of heat. This hood is interiorly partitioned by a wall 10 to define a central gas chamber 11 and a surrounding oil channel 12. These communicate through apertures 13, the lower edge of which, however, is preferably raised some distance above the bottom 91 whereon the hood 1 rests, for a purpose which will appear hereafter.

Gas in the chamber 11 escapes through an opening 14 in the top of the hood 1, about which is formed a marginal ledge to receive an upstanding perforated burner pipe 2. The upper end of this burner pipe is suitably closed, preferably by a spreader 3 having a hole 30 for escape of any residue of gas which has not escaped from the apertures of the pipe 2. The gas which issues from these apertures in the burner pipe is sub-

stantially all gas, generated within the hood 1, and contains no vapor. Issuing from the apertures 20, it is met by air entering the pot through the apertures 90, and is burned with a blue flame.

Oil is admitted to the interior of the hood 1 from the supply pipe 95 through a tunnel 15, which is of sufficient width that its entrance may readily be placed opposite the exit of the pipe 95, so that substantially all the oil which enters at 95 is confined within the tunnel 15 and directed thereby into the oil channel 12. Whatever oil escapes beneath the lower edges of the hood 1 is negligible. However, an overflow opening 16 is provided in a wall of the tunnel 15 or in a wall of the oil channel 12, opening to the exterior of the hood and into the interior of the pot, its lower edge being at a lower level than the lower edge of the opening 13. Thus if oil is supplied in excess of the amount that can be generated as gas, it overflows through the opening 16 into the pot, rather than raising the level within the oil channel 12 to a point where it will overflow through the openings 13 into the gas chamber 11. Thus the gas chamber 11 is substantially free of liquid oil, but filled with oil gas.

The oil which is confined within the oil channel 12 is heated to a considerable degree by heat which is conducted through the metal hood 1, and is thus conducted to the oil. This oil is gasified in this annular channel 12 by conducted heat, and rises through the openings 13 into the chamber 11. Conduction of heat to the oil within the channel 12 is further assisted by vanes 4 which are preferably cast integral with the hood, but upon the outside of the same. The upper ends of these vanes rise above the level of the hood into the zone of influence of the flames issuing from the holes 20 in the burner pipe. Thus these cast vanes 4 are highly heated by direct impingement and radiation of heat from the flames, and conduct this heat to the walls of the hood around the oil channel 12, thus further assisting in heating and gasifying this oil. Furthermore, these vanes extend into any oil which has spilled into the open pot through the opening 16, and by conduction heats this oil. The conduction of heat to the oil is further assisted by a horizontal flange 40 to which heat is conducted from the vanes 4 and through the walls of the hood, and which lies in the oil about the exterior of the generator. This oil is also heated by conduction through the walls of the pot, as is ordinarily the case, and by radiation from the flames within the pot.

As will be evident, such a generator might be formed integrally with the pot, or secured permanently to the same. It is, however, well adapted for installation in pot type burners already in use, and it has been found, when so installed, that it will produce a blue intense flame, where the flame without such a generator was normally yellow. It will, moreover, clear up deposits of carbon or soot which have been formed due to improper combustion.

What we claim as our invention is:

1. An oil burner comprising a pot, means to deliver oil upon the bottom of the pot, a gas generator comprising a metal hood upstanding from the bottom of the pot and internally partitioned to define an annular oil channel positioned to receive oil from said delivery means, and to heat such oil by conduction from the metal, and a gas expansion chamber in communication with the channel, a perforate burner pipe leading from the upper part of the gas expansion chamber, and disposed within the pot, oil gas issuing from its perforations mixing with air within the pot, and burning, and metal heat-conductive radially outstanding ribs formed integral with the hood, and disposed to be heated by the burning gas, and arranged to conduct such heat to the oil channel, thereby to generate gas from the oil therein, and also arranged to conduct heat to the gas expansion chamber, to complete the gasification of any vapor therein, prior to its issuance from the perforations.

2. An oil gas generator for use in a pot type oil burner, comprising a metal hood shaped to rest upon the bottom of the burner, and interiorly partitioned to define a central gas chamber and a surrounding oil channel, the oil channel and gas chamber being in communication through an opening the bottom of which constitutes an oil dam, a second opening from the oil channel to the exterior the bottom of which constitutes an oil dam lower than the first oil dam, whereby liquid oil can not normally enter the gas chamber, and a perforate burner pipe upstanding from the gas chamber, the gas burning as it issues from such perforations.

3. An oil gas generator for use in a pot type oil burner, comprising a metal hood shaped to rest upon the bottom of the burner, and interiorly partitioned to define a central gas chamber and a surrounding oil channel, the oil channel and gas chamber being in communication through an opening the bottom of which constitutes an oil dam, a second opening from the oil channel to the exterior the bottom of which constitutes an oil dam lower than the first oil dam, whereby liquid oil can not normally enter the gas chamber, a perforate burner pipe upstanding from the gas chamber, the gas burning as it issues from such perforations, and heat-conducting vanes disposed to be heated by the flames, and extending to the oil channel, and into the exterior oil overflow space, to heat oil within the channel and within the overflow space by conducted heat.

4. In combination with an oil burner of the type which has a flat bottom, upstanding side walls, means to deliver oil upon its bottom, and means to deliver air under pressure to its interior, a separate gas generator hood adapted to rest upon the burner's bottom, said hood being partitioned to define an annular oil channel and a gas expansion chamber disposed within and upstanding above the oil channel, the oil channel being disposed to receive the oil from the burner's oil delivery means, and arranged to maintain its level below the top of the channel, the partition having apertures affording intercommunication between the channel and the chamber for passage into the chamber of gas or vapor generated from the oil in the channel, laterally directed burner orifices above and communicating with the interior of the chamber, and heat-conductive elements outstanding from the hood and disposed in heat-conductive relation to the chamber and oil channel, and also extending upwardly to a zone to be impinged and heated by flames issuing from the burner orifices.

5. An oil gas generator for use in a pot type oil burner, comprising a metal hood shaped to rest upon the bottom of the burner, and interiorly partitioned to define a central gas chamber and a surrounding oil channel, the channel and the chamber being in communication through an opening the bottom of which constitutes an oil dam, a second opening from the oil channel to

the exterior the bottom of which constitutes an oil dam lower than the first oil dam, whereby liquid oil can not normally enter the gas chamber, and burner orifices leading from the upper portion of the gas chamber.

6. An oil gas generator for use in a pot type oil burner, comprising a metal hood open at its bottom, and interiorly partitioned to define a gas expansion chamber and an adjoining gas generating chamber each open at its bottom, said hood and its partition being shaped to rest upon the bottom of the burner, and thereby to close the bottom of each chamber, and the partition having apertures above its bottom for passage of gas and vapor, which is generated within the generating chamber, into the expansion chamber, means to supply oil within the gas generating chamber, burner orifices leading from the upper part of the gas expansion chamber, the gas burning as it issues from such orifices, and heat-conductive elements disposed in heat-conductive relationship to the gas generating chamber, and likewise disposed to be impinged and heated by flames issuing from the burner orifices.

7. An oil gas generator for use in a pot type oil burner, comprising a metal hood open at its bottom, and interiorly partitioned to define a gas expansion chamber and an adjoining gas generating chamber each open at its bottom, said hood and its partition being shaped to rest upon the bottom of the burner, and thereby to close the bottom of each chamber, and the partition having apertures above its bottom for passage of gas and vapor, which is generated within the generating chamber, into the expansion chamber, means to supply oil within the gas generating chamber, means to maintain the level of oil therein always below the apertures between the two chambers, whereby overflow into the expansion chamber is prevented, burner orifices leading from the upper part of the gas expansion chamber, the gas burning as it issues from such orifices, and heat-conductive elements disposed in heat-conductive relationship to the gas generating chamber, and likewise disposed to be impinged and heated by flames issuing from the burner orifices.

8. An oil gas generator of the character defined, comprising a metal hood shaped to define an enclosed space, said hood being interiorly partitioned to define a gas generating chamber and a communicating gas expansion chamber, burner orifices leading from the upper portion of the gas expansion chamber, the gas burning as it reaches the exterior of the hood through such orifices, and elements of heat-conductive material disposed in heat-conductive relationship to the gas generating chamber, said elements being disposed exteriorly of the hood and in position to receive heat from the flames issuing from the burner orifices, for conduction to and generation of gas from oil within the gas generating chamber, and oil supply means to deliver oil within the gas generating chamber.

9. An oil gas generator of the character defined, comprising a metal hood shaped to define an enclosed space, said hood being interiorly partitioned to define a gas generating chamber and a communicating gas expansion chamber, burner orifices leading from the upper portion of the gas expansion chamber, the gas burning as it reaches the exterior of the hood through such orifices, and elements of heat-conductive material disposed in heat-conductive relationship to the gas generating chamber, said elements being disposed exteriorly of the hood and in position to receive heat from the flames issuing from the burner orifices, for conduction to and generation of gas from oil within the gas generating chamber, and means to deliver oil from a supply source directly to the bottom of the gas generating chamber.

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