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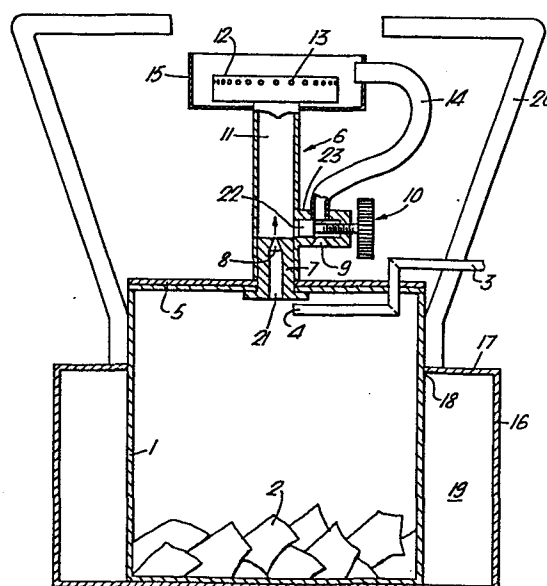
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54 **Acetylene stove or heater.**

57 A stove or heater in which acetylene is used for heating purposes comprises a vessel (1) containing calcium carbide (2) to which water is supplied via a conduit (3), whereby the water and calcium carbide react to form acetylene. The acetylene passes through a jet (8) and a mixture tube (11), and burns at the outlet holes (13) of a rose (12). Some of the burnt gas produced is sucked back into the mixture tube (11) via a return tube (14). The extent to which burnt gas is sucked back into the mixture tube (11) is controlled by a threaded control valve (10), which control valve (10) also controls the extent to which air enters the mixture tube (11) via an air inlet (9). Thus, the valve (10) is a temperature control device.



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ACETYLENE STOVE OR HEATER

This invention relates to a stove or heater in which acetylene is used for heating purposes.

Calcium carbide lamps have already been used
5 for illumination. Such lamps burn with a yellow flame which is not suitable for heating purposes.

In accordance with the present invention, there is provided a stove or heater in which acetylene is used for heating purposes, the stove or heater comprising a vessel for containing calcium carbide in
10 use and having connection means for connection to a supply of water so as to permit in use water to enter the vessel and to react with the calcium carbide to produce acetylene; a burner means through which
15 in use the acetylene produced in the vessel is passed and burnt; and air supply means comprising means for allowing air to mix with the acetylene downstream of a jet through which in use the acetylene produced in the vessel passes and upstream of the burner means
20 through which in use the acetylene gas is passed and burnt.

The air supply means may comprise an air inlet whose extent of opening is controlled by a valve such as a threaded control member.

25 The stove or heater may include means for collecting burnt gases in the vicinity of the burner means, and for returning these burnt gases and mixing

them with the acetylene downstream of the jet and upstream of the burner means.

Preferably, the means for returning the burnt gases is such that the extent to which these burnt
5 gases are returned is also controlled by the valve which controls the extent of opening of the air inlet.

The invention is now described by way of example with reference to the single Figure of the accompanying drawing which shows, in axial section, a stove or
10 heater in accordance with the invention.

With reference to the Figure, a stove or heater in accordance with the invention comprises a vessel 1 containing a bed of calcium carbide 2 when the stove or heater is in operation. A water conduit 3 having
15 an opening 4 within the vessel 1 is connectable to supply of water (not shown) which should have a pressure of 3 to 5 lb per square inch (about 20700 to 34500 N/m^2).

A partition 5 is provided to close the top of
20 the vessel 1. A tube assembly 6 is mounted centrally on the partition 5. The tube assembly 6 comprises a tube 7 which extends through a central aperture in the partition 5 and which includes a jet 8, an air inlet 9, a valve 10, and a mixture tube 11.

25 The mixture tube 11 leads to a burner assembly including a rose 12 provided with holes 13. Burnt gases are sucked back into the mixture tube 11 via one or more return tubes 14. If desired, the burner assembly may include a cover or collector 15. The
30 acetylene gas produced in the vessel 1 passes through the jet 8, into the mixture tube 11.

The vessel 1 is held within an open ended vessel 16 having a larger diameter than the vessel 1. The vessel 16 has an inwardly turned lip portion 17 the
35 radially inner edge of which abuts the side of the vessel 1 and which is fixed to the outer surface of the vessel 1 at point 18. An annular space 19 is

defined between the vessels 1 and 16. Thus a water jacket having an inlet (not shown) and an outlet (not shown) is formed. Support arms 20 are provided to support an article to be heated over the stove or

5 heater.

In use, water is dripped onto the calcium carbide bed 2 via the conduit 3. The carbide and water interact to form acetylene gas, which accumulates within the vessel 1. The acetylene gas passes via a flow passage
10 21 and the jet 8 into the mixture tube 11, and then passes through the holes 13 in the rose 12. The gas is ignited in the normal manner and burns in order for cooking to take place. Approximately 90% of the gas may burn in this way. Some of the burnt gas,
15 i.e. carbon dioxide, is sucked back into the return tube or tubes 14 and then back into the mixture tube 11 due to the effect of the jet 8, where it mixes with the acetylene gas and comes out of holes 13 once more.

20 The valve 10, which is a temperature control device, includes an externally-threaded valve member 22 engaged in internally-threaded casing 23, and controls the extent (if any) to which burnt gas is recycled to the mixture tube 11 and the extent (if any) to
25 which air is allowed to enter the air inlet 9, which inlet may have a diameter of about 3mm. The effect of the valve member 22 is as follows. When the valve member 22 opened to a point such that the air inlet 9 is still closed, the burnt gas flows down the return
30 tube 14 into the mixture tube 11 and proceeds to assist in the combustion. When the valve member 22 is further opened to a position beyond the inlet 9, air is sucked into the area now vacated by the valve member 22 and into the mixture tube 11, and adds more oxygen to
35 the mixture thus giving a hotter flame. When the valve member 22 is closed totally, the flame is then not so hot. Thus, the valve 10 is a temperature control

device.

The size of the jet 8 is of importance. Thus, for example, the jet can be approximately 0.5 mm in diameter. The pressure in the vessel 1 should be
5 from 3 to 4 lb per square inch (about 20700 to 27600 N/m²) and the water pressure should be from 4 to 5. lb per square inch (about 27600 to 34500 N/m²). Thus, by appropriate choice of the water pressure, the gas pressure in the vessel and the size of the jet, there
10 is attained sufficient pressure in the mixture tube 11 to enable the gas to pass to the holes 13 for burning. The gas goes through the holes 13 and is ignited in the usual manner. At this stage, the gas is burnt to produce carbon dioxide. Some of the carbon dioxide
15 goes down the tube or tubes 14, mixes with the acetylene and is converted to carbon monoxide when the acetylene is burning. It is believed that the reason why it is converted is because of the high carbon content of acetylene gas. If carbon dioxide
20 is not sucked down the tube or tubes 14, the stove or heater does not produce a hot flame. The pressure of carbon dioxide stops the acetylene burning at the jet 8. This is an important safety feature.

In a preferred embodiment, the stove or heater
25 is such that virtually all of the burnt gas is sucked back into the mixing tube 11 via the return tube or tubes and its or their associated valve or valves 10. In this case, the heating capacity of the stove or heater is improved, and a larger quantity of carbon
30 monoxide is burnt thereby making the stove or heater safer.

The mixture thus produced in mixture tube 11 passes through the holes 13 in the rose 12, and burns with a relatively hot flame when ignited, compared
35 to a flame of pure acetylene gas.

The stove or heater is portable, and can be used with a small water tank fitted with a ball valve so

that the water pressure is kept at 3 to 5 lb per square inch (about 20700 to 34500 N/m²).

It is an advantage of the invention that calcium carbide is a relatively inexpensive fuel which can
5 be transported and stored easily and safely.

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CLAIMS

1. A stove or heater in which acetylene is used for heating purposes, the stove or heater comprising a vessel for containing calcium carbide in use and having connection means for connection to a supply of water so as to permit in use water to enter the vessel and to react with the calcium carbide to produce acetylene; a burner means through which in use the acetylene produced in the vessel is passed and burnt; and air supply means comprising means for allowing air to mix with the acetylene downstream of a jet through which in use the acetylene produced in the vessel passes and upstream of the burner means through which in use the acetylene gas is passed and burnt.
2. A stove or heater as claimed in claim 1, wherein the air supply means comprises an air inlet whose extent of opening is controlled by a valve.
3. A stove or heater as claimed in claim 1 or 2, including means for collecting burnt gases in the vicinity of the burner means and for returning these burnt gases and mixing them with the acetylene downstream of the jet and upstream of the burner means.
4. A stove or heater as claimed in claim 2 and 3, wherein the means for returning the burnt gases is such that the extent to which these burnt gases are returned is also controlled by the valve which controls the extent of opening of the air inlet.
5. A stove or heater as claimed in any of claims 1 to 4, including a jacket for containing water, surrounding the vessel for containing calcium carbide.

