Aug. 27, 1957 C. F. MALLORY 2,804,132

STOVE

Filed Aug. 17, 1955

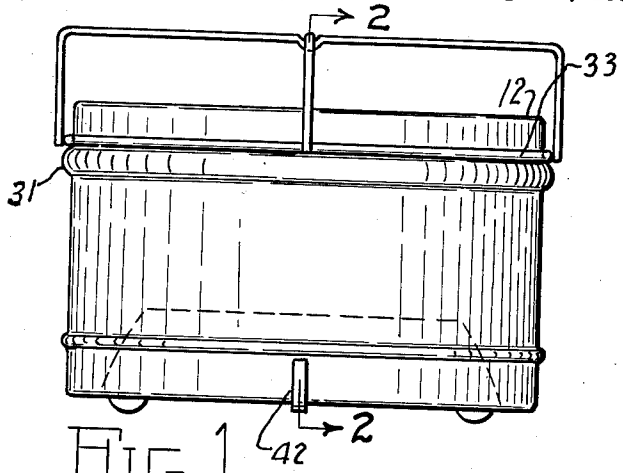
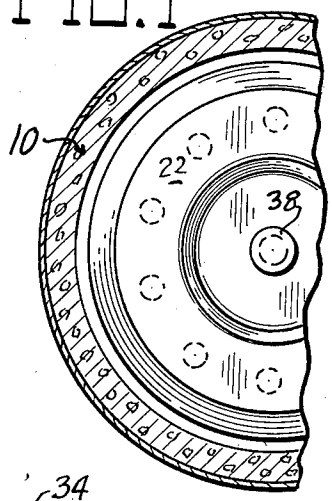


FIG. 1.

FIG. 4



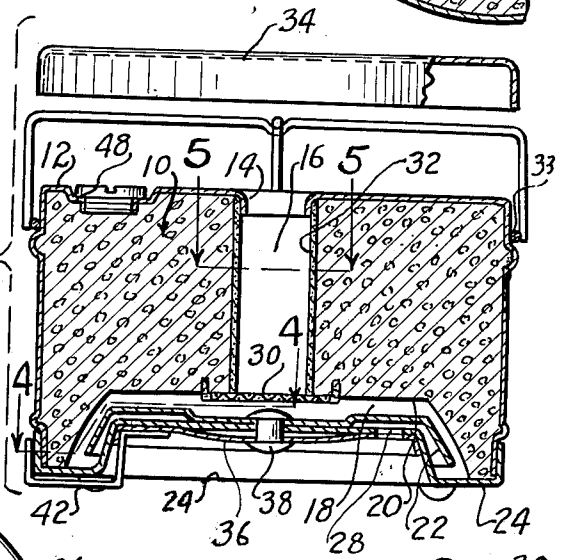


FIG. 2.

FIG. 3.

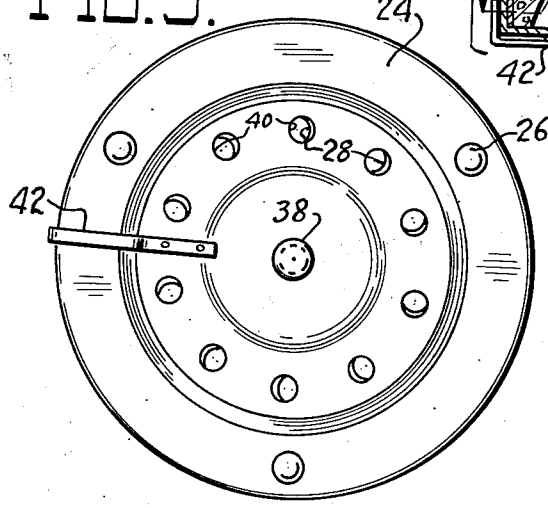
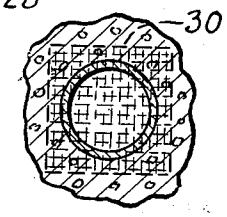


FIG. 5.



INVENTOR.

Carl F. Mallory

BY

Owen & Owen

ATTORNEYS

United States Patent Office 2,804,132 Patented Aug. 27, 1957

2,804,132

STOVE

Carl F. Mallory, Toledo, Ohio, assignor to Mallory Manufacturing Company, Toledo, Ohio, a corporation of Ohio

Application August 17, 1955, Serial No. 528,990

5 Claims. (Cl. 158—96)

This application constitutes a continuation-in-part of my co-pending application Serial No. 437,123, filed June 16, 1954, now abandoned.

This invention relates to stoves of the type in which a vaporizable liquid fuel is used, and is particularly directed to a small, easily transportable unit which can be used on camping trips and the like.

The primary object of the invention is to provide a stove which can be fueled with a small quantity of liquid fuel and which will efficiently vaporize and consume the fuel charge over a long period.

Another object of the invention is to provide a stove of the above character in which the fuel charge is temporarily absorbed in a porous body of the stove itself and is gradually vaporized into a central mixing chamber by the passage of directed air currents across an exposed surface of the porous body, the remaining surfaces of the porous body being covered or kept from contact with air.

Another object of the invention is to provide a simple and efficient means for directing primary combustion air across the exposed surface of a fuel-charged body in a mixing chamber whereby fuel is extracted from the body for combustion in a separate combustion chamber, removed from the mixing chamber.

Still another object of the invention is to provide a stove comprising a body of relatively porous heat resistance material in which a fuel charge may be absorbed for subsequent vaporization, said body having a casing or enclosing surface of vapor impermeable material leaving only a pre-selected portion of the body uncoated and exposed for the vaporization of the contained fuel charge.

Other objects and advantages of the invention will become apparent from the following detailed description of a preferred embodiment thereof, reference being had to the accompanying drawings, in which—

Fig. 1 is a side elevational view of a stove embodying the present invention;

Fig. 2 is a section on line 2—2 of Fig. 1 with an associated cover shown above the stove body;

Fig. 3 is a bottom plan view of the stove;

Fig. 4 is a section on line 4—4 of Fig. 2; and

Fig. 5 is a fragmentary section taken on line 5—5 of Fig. 2.

Referring to the drawings and particularly to Fig. 2 thereof, the stove made in accordance with the present invention comprises a block of fuel absorbing material designated generally **10** which is preferably contained or housed within a can-like outer container **12**, the can thus furnishing a vapor impermeable coating to the side walls and top of the block of fuel absorbing material **10**. A central opening **14** is formed in the top surface of the can and registers with a cylindrical center passage **16** running completely through the block **10** so that it terminates at its upper end at the atmosphere and at its lower end in a mixing chamber **18**. The mixing chamber **18** is defined on its upper surface by the exposed, uncoated

and vapor permeable walls of the fuel block **10**, designated **20** in Fig. 2 and at its lower surface by an air directing baffle **22**. The baffle **22** is riveted or otherwise fixed to a base **24**.

The base **24** is preferably formed from sheet metal and is provided with a plurality of small integral feet **26** which will support the base, and thus the stove, a short distance above any surface on which the unit is mounted. The base **24** is dished upwardly at its center and is formed on its outer periphery with a suitable mating surface for the side walls of the can enclosure **12**. The central dished area of the base is provided with a series of air holes **28** extending into the stove below the baffle **22** so that air passing through the holes **28** cannot have direct access to the vaporizing surface of the fuel block **10** but must pass outwardly, downwardly and thence upwardly along the surface **20** of the fuel block into the mixing chamber. By thus providing a long surface for the flow of air along the surface of the fuel block a much more intimate mixture of fuel and air is provided over a longer period of time than would be the case if the air were permitted to pass directly into the mixing chamber and thence upwardly to be burned as hereinafter described.

The fuel absorbing block **10** may be conveniently made of a mixture of asbestos fiber and Portland cement, or of the mineral perlite and Portland cement, or of fly ash and a suitable binder mixed with an appropriate amount of water and permitted to set in a mold. The block may also be made of a ceramic clay tile material, molded and fired into a porous body of appropriate shape.

Extending upwardly from the mixing chamber **18** is the central passage **16** which forms a combustion chamber terminating at the upper end of the fuel block in the opening **14**. The combustion chamber or center opening **16** is separated from the mixing chamber by a screen **30** and burning of the fuel mixture takes place above the screen and cannot flash back into the mixing chamber.

It will be seen that the fuel block **10** is covered on all sides and at the top with the vapor impermeable metal surface of the can. At its surface where it is formed into the central passage **16** the fuel block is also made vapor impermeable either by coating this surface with a mixture of neat cement and water into a layer **32** or by fire-hardening the surface of the passage or combustion chamber **16**. It has been found that if a sufficiently intense flame is permitted to burn in the passage for a relatively short period of time a vapor impermeable surface will be burned onto the walls of the center chamber although in some instances it is preferred to make this surface vapor impermeable by a coating as mentioned above. Thus the only surface of the fuel block through which the fuel may be extracted is the surface **20** exposed to the mixing chamber.

Preferably the metal container **12** is provided with a rib **31** therearound and relatively close to the upper surface for the reception of a wire grill which may be slipped down over the top of the metal container and into contact with the rib **31**. The wire grill may comprise an encircling band **33** with upstanding wire legs welded or otherwise fixed thereto, the legs being of U-form with their free ends attached to the encircling band **33** and crossing each other immediately above the upper end of the central passage **16**.

A suitable cover **34** shown only in Fig. 2, is provided for the stove which may conveniently take the place of the wire grill and fit tightly over the top of the stove and over the sides thereof down against the rib **31** when the stove is to be transported. With the cover in place no air will pass into the mixing chamber and no combustion will take place after the cover is put on.

It is preferred to regulate the quantity of combustion air entering the mixing chamber through the holes **28** by

means of a suitable valve mechanism such as a plate **36** pivoted on the central rivet **38** which fastens the baffle **22** to the base **24** of the stove. The plate valve **36** is provided with holes **40** spaced the same as and equal in number to the holes **28** in the dished base **24**. When the holes are completely in registry the maximum air will be permitted to enter beneath the baffle and into the mixing chamber and when the holes are completely out of registry the supply of air to the mixing chamber will be shut off and the stove will thus go out.

An operating handle of appropriate form, designated **42**, extends from the plate valve **36** downwardly and outwardly beneath the base **24** between the legs **26** and is thence extended upwardly to provide a convenient operating handle for movement of the valve without displacing the stove from the surface on which it is resting.

The stove is preferably provided with a filler opening **48** closed by a threaded plug. When the plug **48** is removed, fuel, such as alcohol, may be poured through the filler opening into contact with the block **10** to be absorbed thereby.

In the operation, liquid fuel such as alcohol is poured into the filler opening **48** and is absorbed by the block **10**. The fuel cannot escape through the outer walls of the block or directly into the passage **16** since these surfaces are covered by a vapor impermeable coating and the only surface from which the fuel can exude is the surface **20** forming the upper surface of the mixing chamber. The stove is lighted by inserting a match into or immediately over the central passage **16** and the initial burning takes place in this passage. After a short time the convection currents of air flowing through the registering passages **40** and **28** and downwardly beneath the baffle sweep across the lower surface of the porous block **10** and pick up sufficient fuel to support combustion above the screen **30**. When these convection currents have reached their final, stable velocity, the operator can adjust the intensity of the flame by opening or closing the ports **40** with relation to the stationary openings **28** in the base of the stove and thus regulate the intensity of the flame by regulating the fuel-air mixture passing through screen **30** into the center passage **16**. The exact location of the flame will depend to a certain extent on the registry of the openings **40** and **28** and thus on the quantity of air entering the stove but cannot ever reach a point below the screen **30** and will in most instances be within the center opening **16** although with very high air supply burning may take place at the opening **14** at the top of the stove.

The operator or user can place the wire grill over the top of the stove down against the rib **31** and a pan or other container can thus be placed on the grill. It has been found in use that one ounce of alcohol fuel will burn with a hot intense flame for a period ranging from 45 minutes to one hour.

When it is desired to put out the flame, as upon completion of a cooking operation, the operator can either move the openings **40** out of registry with the openings **28** or can place the cover **34** over the top of the container and thus cut off the flow of air through the unit. The stove can be then readily transported since the sides thereof do not become heated to any great extent by the combustion in the passage or chamber **18**.

While the invention has been disclosed in conjunction with a specific form and disposition of the parts, it should be appreciated that numerous modifications and changes thereof may be made without departing from the spirit of the appended claims.

What I claim is:

1. A stove or the like comprising a body of porous material capable of absorbing liquid fuel, a central combustion chamber extending vertically through said porous body, a casing of vapor impervious material in contact with and covering the top, outer wall and the wall of the combustion chamber, said casing being spaced from the bottom surface of the porous body leaving a space between the bottom of the porous body and the bottom of the casing, air passages formed in the bottom of said casing and means for regulating the amount of air passing through said passages to said mixing chamber.

2. A stove or the like comprising a body of porous material capable of absorbing liquid fuel, a central passage through said body forming a combustion chamber, a vapor impervious casing for said body surrounding and in contact with the sides and top thereof and extending into said combustion chamber and in contact with the wall thereof, a mixing chamber formed by spacing the bottom wall of said casing from the bottom surface of said body, controllable valve means to admit air into said mixing chamber, baffle means in said chamber to direct air entering through said valve means across substantially the entire exposed surface of said body, whereby fuel absorbed in said body is released as vapor and intimately mixed with air in said mixing chamber to form a combustible mixture in said combustion chamber.

3. A stove in accordance with claim 2 in which said body of porous material comprises a mixture or fibrous material and cement and said vapor impervious coating comprises a metallic sheath.

4. A stove or the like comprising a body of porous material capable of absorbing liquid fuel, a central passage through said body forming a combustion chamber, a vapor impervious casing for said body surrounding and in contact with the sides and top thereof and extending into said combustion chamber and in contact with the wall thereof, a mixing chamber formed by spacing the bottom wall of said casing from the bottom surface of said body, said casing having air openings through the bottom thereof adjacent said mixing chamber, means to control the effective size of said air openings, baffle means to direct air entering said air openings across substantially the entire lower surface of said body, whereby fuel absorbed in said body is released as vapor and intimately mixed with air in said mixing chamber to form a combustible mixture in said combustion chamber.

5. The structure according to claim 4 and having a screen in the bottom of the combustion chamber adjacent the top of the mixing chamber.

References Cited in the file of this patent

UNITED STATES PATENTS

286,914	Dimock et al.	Oct. 16, 1883
698,502	Hosea	Apr. 29, 1902
857,064	Holgate	June 18, 1907
1,065,834	Pike	June 24, 1913
1,650,148	Nathan	Nov. 22, 1927
2,422,686	Labiberte	June 24, 1947

FOREIGN PATENTS

248,919	Germany	July 5, 1912