July 6, 1948. S. T. HOWARD 2,444,444

PORTABLE STOVE

Filed April 17, 1944 2 Sheets-Sheet 1

Fig. 1

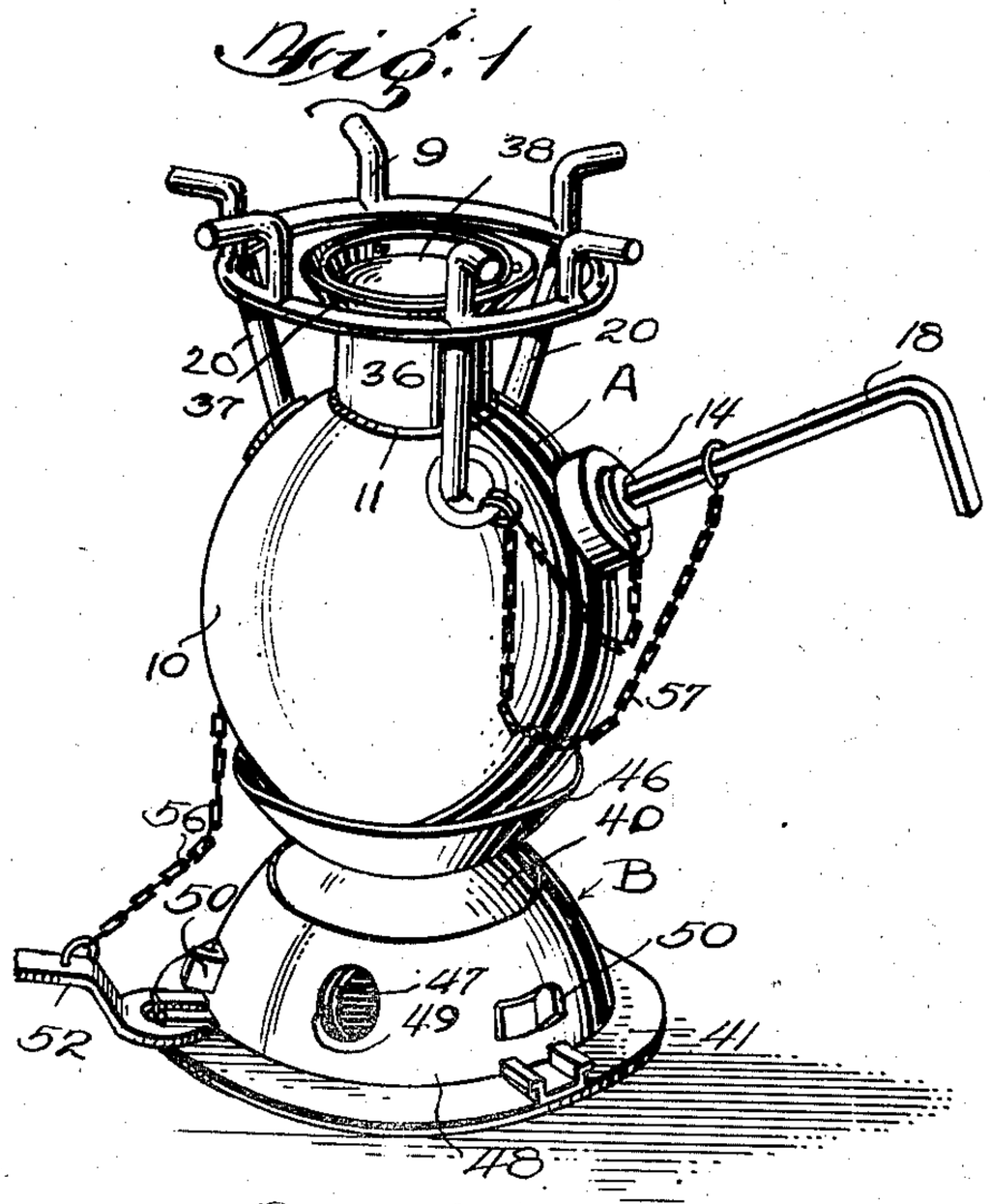
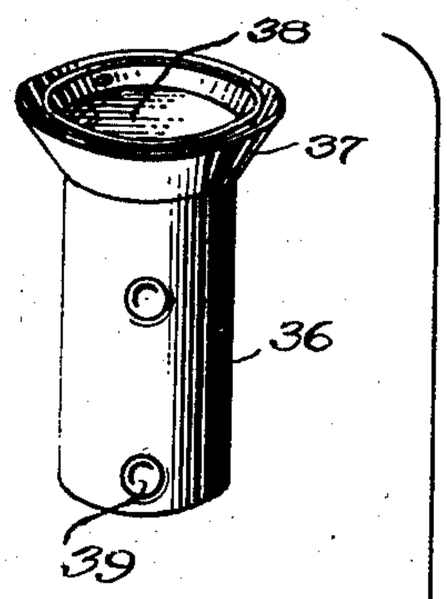


Fig. 2



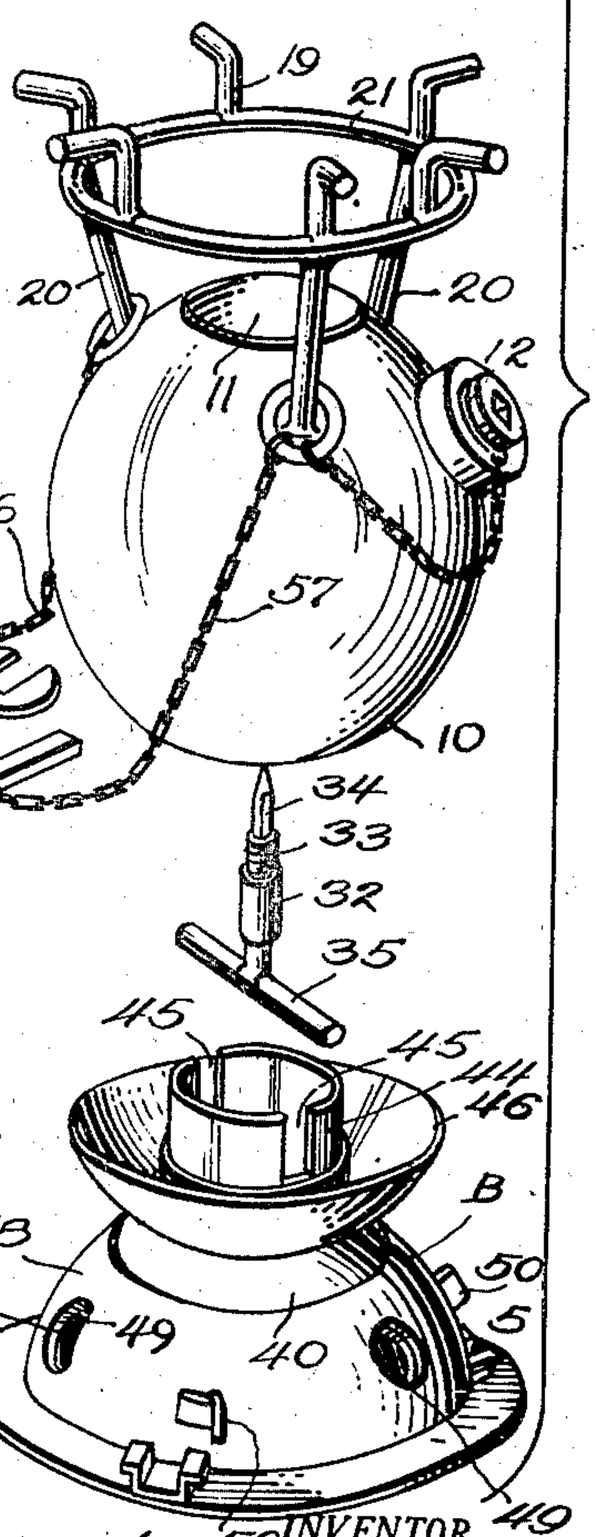
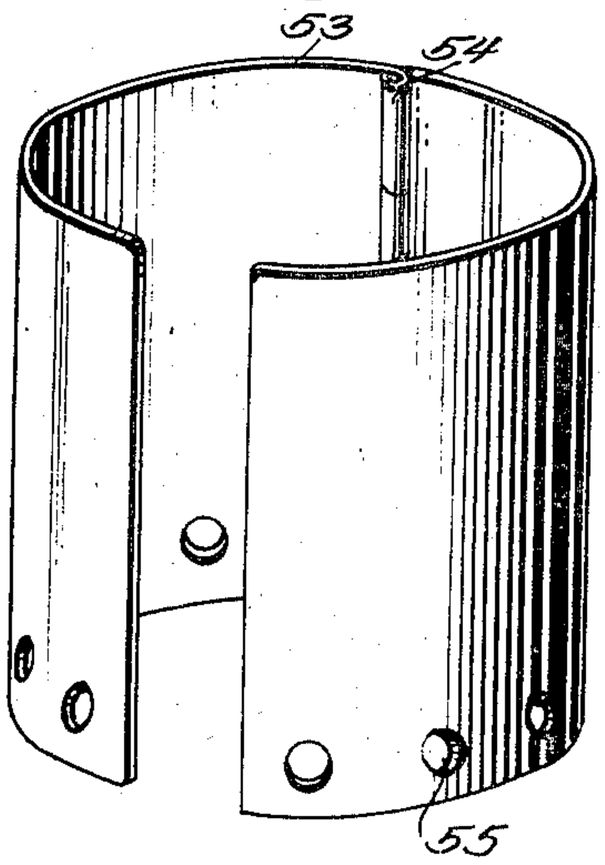


Fig. 4



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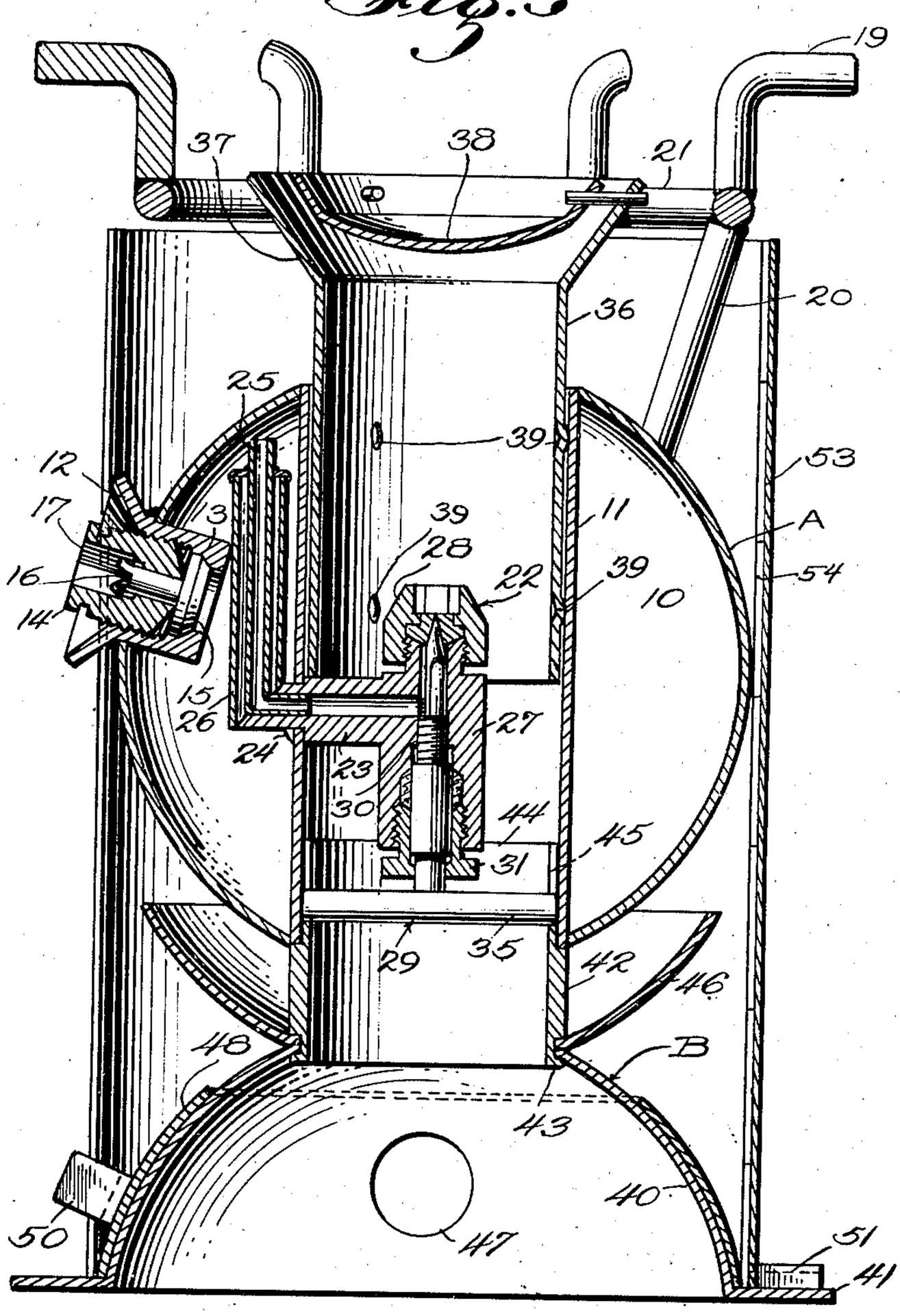
PORTABLE STOVE

Filed April 17, 1944 2 Sheets-Sheet 2

Fig. 3



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Patented July 6, 1948

2,444,444

UNITED STATES PATENT OFFICE

2,444,444

PORTABLE STOVE

Styles T. Howard, Jeffersonville, Ind.

Application April 17, 1944, Serial No. 531,443

20 Claims. (Cl. 126—44)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

The invention relates to a single burner gasoline cook-stove in which the fuel is vaporized in a fuel tank surrounding the burner and the vapor is transmitted to the burner jet without further heating.

The invention has particular value in connection with the provision of heating units for small detachments of the armed forces of the United States. Even a single fire unit of the gasoline field range M–37, as shown in my Patent No. 2,331,913, October 19, 1943, Fire unit carrying case and heater, is not adapted for transportation by hand and use by scouting, skiing or paratrouper groups. The portable single burner stove needed for use units and also for individuals must have no complicated or easily disordered parts, be rugged in construction, quick, sure and safe in use, as light in weight as possible and easily packed and carried.

It is therefore an object of this invention to provide a single burner gasoline stove which can be readily transported by individual soldiers and other members of the armed forces and used to heat food or water quickly and efficiently without danger of accident or of the stove failing to work through some injury, maladjustment or exposure to adverse conditions.

It is a further object of the invention to provide a compact stove unit comprising a body rotatably mounted on a base, wherein the burner valve is controlled by relative rotation between the body and the base.

It is a further object of the invention to provide means for handling the stove when it is hot and rotating the parts, which means constitute the operating wrenches for effecting other adjustments and operations, in connection with the stove.

Further objects of the invention will be apparent from a consideration of the ensuing description taken in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of the assembled stove with the operating wrenches in position to serve as handles for the stove.

Fig. 2 is an exploded view of the stove showing, from top to bottom, the detachable burner tube, the stove body composed of a fuel tank and pot support, the burner valve and the detachable base.

Fig. 3 is a vertical sectional view through the

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stove in the plane of the filler inlet, showing the wind screen in place.

Fig. 4 is a perspective view of the wind screen.

In Fig. 1 the body of the stove is designated A and comprises, as shown more particularly in Fig. 3, a spherical fuel tank 10 having passage means therethrough, namely a cylindrical tube 11 extending through the center from top to bottom and having both ends open. The tank 10 has a filler opening including a funnel-shaped inlet 12 and a closure seat 13. The inlet is closed by a screw plug 14 carrying a closure disk 15 which fits tightly against the seat 13 and is secured to the plug 14 by means of a split pin 16. The plug 14 is broached at 17 to receive the polygonal wrench 18 for removing and inserting it. The spherical tank 10 also carries a pot support 19 formed of a plurality of bars 20 welded to the body and reinforced and secured together by a ring 21.

The burner assembly 22 is located centrally of the cylindrical tube 11 and spherical tank 10 and is supported on a fitting 23 permanently secured in the side wall of the cylindrical tube 11 at 24 by brazing or other appropriate means. The fitting 23 is hollow and terminates within the tank in the vapor inlet pipe 25, which extends to the upper part of the tank and is surrounded by a spaced sleeve 26. Within the tube 11 the fitting 23 carries a vertical tubular or sleeve portion 27 threaded at the top to receive the burner jet 28, which is also broached to receive the wrench 18. The lower portion of the sleeve 27 is shaped to receive the flame or burner valve 29 which is threaded into the sleeve for adjustment at 30 and which has a packing tightened by the nut 31.

The flame valve, as shown more particularly in Fig. 2, consists of a cylindrical stem portion 32, a threaded portion 33 engaging the threads 30 of the sleeve 27, the needle valve 34 and a T-head or handle 35. There is inserted in the upper part of the cylindrical tube 11 above the burner assembly a removable burner tube 36 having a flared top 37 and a flame spreader 38 secured within and spaced from the flared top 37 to form a flame slot. The protuberances 39 on the cylindrical wall of the burner tube 36 serve to secure the burner tube within the tank tube 11 by friction and to space the burner tube from the tank body to provide a uniform blanket of air around the burner tube, thus preventing overheating of the gasoline.

The base B of the stove comprises a hollow hemispherical base member 40 having a flange 41 extending from its bottom to furnish a more secure support for the stove. A tube 42 is at-

tached to the top of the member 40 by a flange 43, and extends upwardly to form a portion 44 of somewhat smaller diameter to be inserted in the tube 11 of the stove body to support the body on the base. The portion 44 of the tube 42 is slotted at diametrically opposite points 45 to receive the extremities of the T-head 35 of the burner valve. A priming pan 46 of cup shape is secured to the base by the flange 43 which secures the tube 42 to the base member 40. Around the periphery of the base member 40 is provided a series of air vents 47, and on the exterior of the base there is an annular sleeve or shutter 48 rotatably mounted and having a series of apertures 49 which may be made to register partly or completely with the apertures 47 of the base member 40 to control the air supply to the burner. Lugs 50 are provided on the shutter for moving it relatively to the base. The base B is also provided with lugs 51 on the flange 42 to be engaged by the engineer's wrench 52, which is employed to remove or adjust the packing nut 31 as well as for a handle for the base B. A wind screen 53 composed of two semi-cylindrical members hinged at 54 and having a series of air vents 55 is provided to enclose the stove when used in windy or stormy weather, particularly to confine the heat from the priming charge closely around the fuel tank; the screen is apertured to accommodate projecting filler plug 14 on rotatable tank A (see Fig. 3). The wrenches 18 and 52 are secured to the pot support by chains 56 and 57 which prevent their loss but permit their use in each of the relations described.

To operate the heater the user should proceed as follows:

Lift the body A from the base B and remove the filler tube plug 14 from the tank filler opening, being sure the polygonal wrench 18 is inserted all the way. See that the flame valve 29 is closed, hold the tank 10 with the filler tube funnel 12 upward and fill with gasoline until it is level with the opening when the tank is in vertical position. Pour into the priming cup 46 enough gasoline to heat the tank. In warm weather about half the amount the priming cup will hold will be enough. Set the tank 10 on the base B with the flame valve stem handle 35 entering the slots 45 in the tube 44. Insert the long end of the polygonal wrench 18 in the filler tube plug 14 and place the engineers' wrench 52 on one of the lugs 51 on the base flange 41. Close the air holes 47 in the base by rotating the shutter 48; set fire to the gasoline in the priming cap. If wind interferes set the shield 53 around the stove. Immediately after the priming gasoline has burned out open the flame valve 29 about one quarter turn by rotating the tank 10 counter-clockwise and immediately apply a match to the slot in the burner tube 36. When the flame forms inside the burner tube open the air shutter 48 to give the type of flame desired. To stop the flame rotate the tank clockwise until the flame valve 29 is closed. The heater should be cooled before refilling.

From the foregoing description it will be seen that the usual gasoline stove construction has been greatly simplified. By vaporizing the entire fuel supply in the fuel tank, applicant has been enabled to omit both the vaporizing means in the fuel line and the means to place the gasoline in the tank under pressure. By locating the burner within the fuel tank, direct heat for vaporizing the gasoline is supplied, which is a simpler and cheaper construction, and not dangerous in so small a stove. The spherical shape of the tank

furnishes a construction sufficiently strong to withstand the pressure of the vaporized gasoline with a minimum of weight, and at the same time it provides a strong body for the stove, which carries the pot support and protects the burner from injury caused by rough contact with other objects.

Since the tank 10 is filled approximately half full, space above the gasoline for the vaporized fuel is provided and the burner inlet draws the vapor from the upper part of this space where it is hottest. The inlet tube 25 is insulated by the jacket 26 to prevent condensation of the vapor before it reaches the burner jet.

By arranging the burner valve 29 so that it is operated by rotating the body A on the base B, and by providing inlet plug 14 on body A with a socket 17 (see Figure 3) to receive removable polygonal wrench 18, I avoid the necessity of having a valve handle projecting from the tank where it would be heated by the burning of the priming charge, and it is therefore possible to place the priming cup 46 directly below the fuel tank 10. By placing the priming cup 46 directly below fuel tank 10, a maximum amount of heat is delivered to the contents of the tank by burning the priming charge, which results in vaporization of the fuel in the tank and ignition of the heater. It is particularly important that there should be no uncertainty in the lighting or operation of the stove when it is used under war conditions, especially in winter or in the extreme North. By the use of the necessary wrenches as detachable handles for the body A and base B, the entire device is reduced to a minimum number of parts with nothing likely to be lost and the whole capable of being packed within a cylindrical container of substantially the same dimensions as the width of the base and the height of the stove.

Having thus described my invention, what I claim is:

1. A liquid-fuel burner comprising a fuel tank rotatably supported on a base, a flame valve carried by said base, a burner jet mounted on said tank in non-rotatable relation therewith, means for relatively rotating said tank and said base, and means to move said valve into and out of closing relationship with said burner jet as a result of the rotative movement of said tank on said base.

2. A liquid-fuel burner comprising a fuel tank rotatably supported on a base, a flame valve carried by said base, a burner jet mounted on said tank in non-rotatable relation relative to said tank and surrounded by said tank, means for relatively rotating said tank and said base, and means to move said valve into and out of closing relationship with said burner jet as a result of the rotative movement of said tank on said base.

3. A liquid-fuel burner comprising a fuel tank rotatable on a base, a burner jet mounted on said tank in non-rotatable relation therewith, a flame valve in operable relation with said burner jet, means for relatively rotating said tank and said base, and means to move said flame valve into and out of closing relationship with said burner jet as a result of the rotative movement of said tank on said base.

4. A liquid-fuel burner comprising in combination a base, a fuel tank rotatable on said base, a burner jet mounted on said tank in non-rotatable relation therewith, a flame valve carried by said base, said burner jet and flame valve being in operable relation with each other, means for

relatively rotating said tank and said base, and means to move said flame valve into and out of closing relationship with said burner jet as a result of the rotative movement of said tank on said base.

5. A liquid-fuel stove comprising a fuel tank having a burner mounted on said tank in non-rotatable relation therewith, and a base, the tank being rotatably mounted on the base, the burner having a flame valve, said flame valve and said base being interconnected whereby the valve is operated when the tank and base are rotated relative to each other, and means mounted on said tank to support a vessel above said burner.

6. A liquid fuel stove comprising a base carrying a flame valve, a fuel tank having tubular vertical passage means therethrough and a burner jet mounted within said passage means in non-rotatable relation with said tank and in operable engagement with said flame valve, said burner jet comprising a fitting having an inlet directly connected to said passage means, said fuel tank being rotatable on said base and operating said burner jet by rotation relative to said base.

7. A liquid-fuel stove comprising a burner, a fuel tank surrounding the burner and heatable thereby, and a base having means for supporting the burner and tank, said tank and burner being in non-rotatable relation relative to each other and rotatable together on said base, and a flame valve in operable relation with said burner and non-rotatably associated with said base, whereby the valve is operated by rotating the tank with the burner on said base.

8. A liquid fuel stove comprising a fuel tank having a burner mounted thereon and a base, the tank being telescopically and rotatably mounted on the base, the burner having a flame valve, said valve and said base having inter-engaging means whereby the valve is operated when the tank and base are rotated relatively to each other.

9. A liquid fuel stove comprising a tank, a burner mounted thereon, and a base having an upstanding flange on which the tank is rotatably and removably mounted, said flange having oppositely placed notches and said burner having a valve with a stem having a T-head received in said notches, whereby the burner valve is operated by rotating the tank and burner on the base.

10. A stove comprising a spherical fuel tank having a cylindrical tube extending through its center and having a fuel inlet line entering the tube from the tank approximately midway of the tube and terminating in a flame valve and burner jet, a removable burner tube in the upper end of said cylindrical tube and a removable base engaged in the lower end of said cylindrical tube, said cylindrical tube being freely rotatable on the base, and the flame valve being provided with means engaging the base detachably and non-rotatably.

11. In a liquid fuel cooking stove, a substantially spherical fuel tank having tubular passage means through its center, terminating at the top in a flame slot and at the bottom in a hollow hemispherical base having valved air openings, and a burner located substantially midway of said passage means through said tank and having a flame valve and a fuel inlet leading to the upper part of the tank, whereby the fuel is vaporized in the tank and supplied therefrom directly to the burner, the tank with the burner being rotatable on the base and the burner valve being non-rotatably engaged with the base, and being operated by relative rotation between the base and tank.

12. A liquid fuel stove comprising a stove body including a pot support and a burner having a flame valve with a downwardly extending stem, and a base on which the body is rotatably mounted, said valve stem and said base being non-rotatably engaged, and the body and base being provided with means engageable by wrenches which form handles for rotating the body on the base to control the flame valve.

13. A stove having a body portion comprising a substantially spherical fuel tank having a burner centrally located therein, the burner having a flame valve with a downwardly extending stem, and a base on which said body portion is detachably and rotatably mounted, said stem engaging said base detachably but non-rotatably, said tank having an inlet provided with a plug having a recess to receive a wrench and said base having wrench engaging lugs, and two wrenches secured to the stove by flexible connections for engaging the stove body and base when they are hot to close the flame valve by rotating the body on the base.

14. A stove comprising a fuel tank having a tube extending vertically therethrough and having a fuel inlet line entering said tube from said tank and terminating in a burner jet, a removable base engaged in the lower end of said tube, said tube being freely rotatable on said base, and a flame valve in operable relation with said burner jet and provided with means for engaging said base non-rotatably.

15. A liquid-fuel cooking stove, comprising a fuel tank having vertical tubular passage means therethrough, said tubular passage means terminating at the top in a flame slot and at the bottom in a hollow base having valved air openings, and a burner having a burner jet located within said tubular passage means, said burner having a fuel inlet passing directly from the burner jet through said tank and continuing within said tank to the upper part of said tank, and a flame valve in operable relation with said burner, said tank with said burner being rotatable on said base, and said valve being non-rotatably engaged with said base and operated by relative rotation between said base and said tank, whereby fuel is vaporized in the tank by heat exchange from said burner and supplied from said tank directly to the burner.

16. In a liquid-fuel stove, the combination of a fuel tank having tubular vertical passage means therethrough, of a base carrying a flame valve and supporting said tank rotatably, and of a burner, said burner comprising a burner jet mounted within said tubular passage means in non-rotatable relation relative to said tank and in operable engagement with said flame valve, said burner having an inlet tube extending into the tank and upwardly within the tank to a point adjacent the top, said burner operating to heat and vaporize the fuel in the tank, said flame valve being operated by rotating said tank relative to said base.

17. A stove comprising a fuel tank having a tube extending therethrough and having a fuel inlet line within said tank entering said tube from said tank, a burner jet fitting mounted on said tube in non-rotatable relation relative to said tank and receiving the said fuel inlet line directly, a removable burner tube in the upper end of said first-named tube, and a removable base engaged in the lower end of said first-named

tube, said base carrying a flame valve in operable engagement with said burner jet, said tank being rotatable on said base and operating said flame valve by rotation relative to said base.

18. A liquid-fuel stove comprising a fuel tank having a burner non-rotatably mounted thereon, and a base, the tank being rotatably mounted on the base, a flame valve in operable engagement with said burner, said valve and said base being interconnected, whereby the valve is operated when the tank and base are rotated relative to each other, and socket means on said tank for removably inserting therein handle means for rotating said tank.

19. A liquid fuel stove comprising a fuel tank having a burner non-rotatably mounted thereon, a base, said tank being rotatably mounted on said base, a flame valve in operable engagement with said burner, said valve and said base being interconnected, whereby said valve is operated by relative rotation of said tank and base, a projection on said tank for rotating said tank, and a screen positioned on said base, said screen being apertured to accommodate said projection.

20. A liquid-fuel stove comprising a fuel tank having a burner mounted thereon, and a base, the tank being rotatably mounted on the base, the burner having a flame valve, said valve and said base being interconnected, whereby the valve is operated when the tank and base are rotated

relative to each other, socket means on said tank adapted to receive handle means for rotating said tank, and a windscreen positioned on said base so as to surround said tank, said shield being apertured for removably inserting handle means into said socket means to rotate said tank without removing said windscreen.

STYLES T. HOWARD.

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