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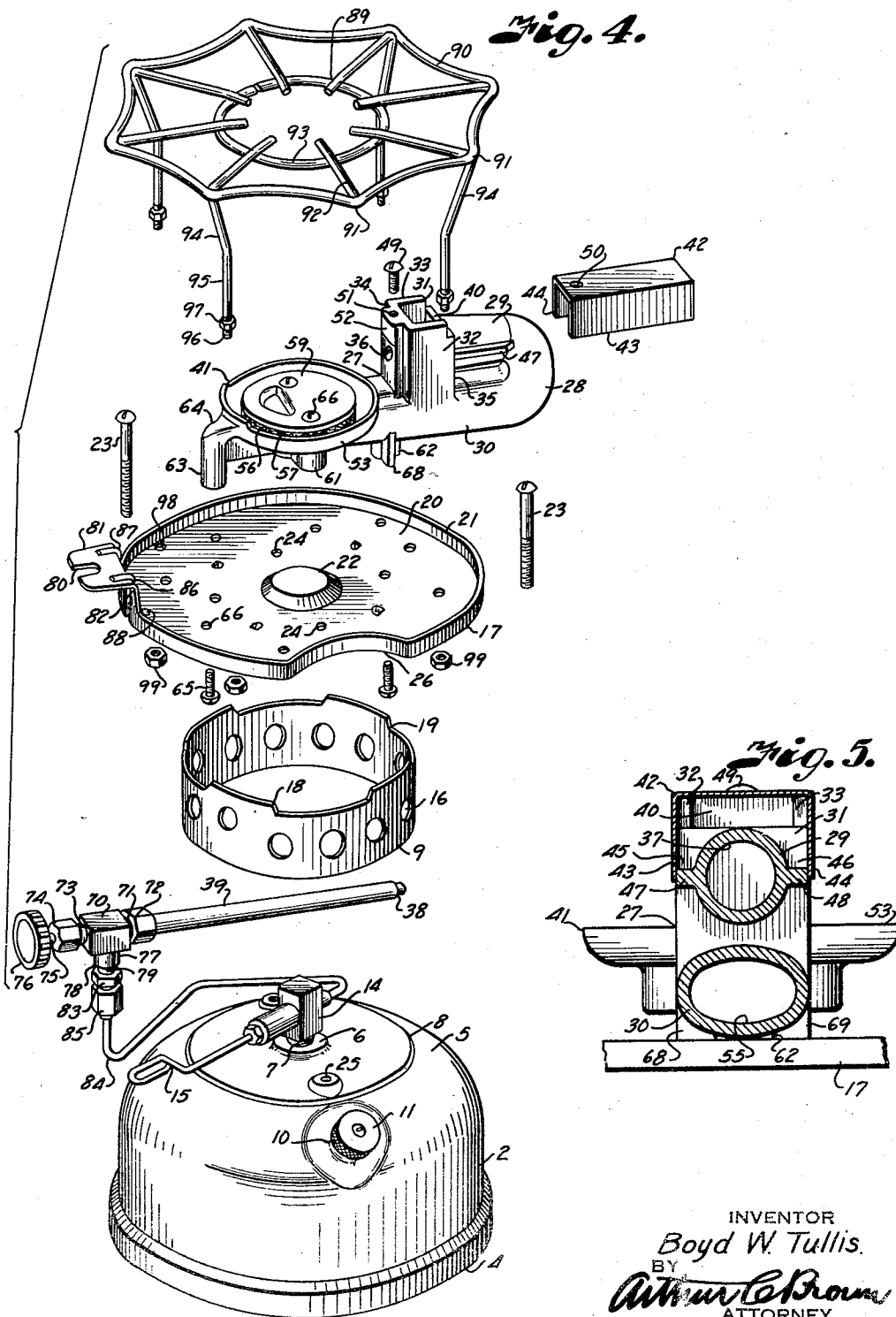
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PORTABLE STOVE

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## PORTABLE STOVE

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This invention relates to stoves, particularly to those of portable type for general purposes and using a hydrocarbon fuel. Heating appliances of this character are provided with a generator which, unless accurately aligned with its Bunsen, does not operate satisfactorily. It is also difficult to maintain this alignment for the reason that such stoves are usually subjected to rough handling.

It is, therefore, the principal objects of the present invention to provide a strong, light weight, portable stove construction which is capable of withstanding the buffeting about and rough handling to which such stoves are subjected; to provide a portable stove of relatively inexpensive construction and capable of rapid and accurate assembly; and to provide a novel grid construction forming a cage-like structure for the protection of the burner and generator assembly, and acting in cooperation with a sheet metal base plate to form a rigid support therefor.

It is also an object of the invention to provide a burner and Bunsen unit so constructed that the air intake thereof is out of the direct heat of the flame and in the natural draft of air moving upwardly about the sides of the stove.

In accomplishing these and other objects of the invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a stove constructed in accordance with the present invention.

Fig. 2 is a vertical section through the upper part of the stove and showing the fount in elevation.

Fig. 3 is a similar section taken at right angles to the section illustrated in Fig. 2, with the upper part of the fount being broken away to better illustrate connection of the fount with the generator.

Fig. 4 is a detail perspective view of the parts of the stove shown in disassembled spaced relation.

Fig. 5 is a section through the Bunsen on the line 5—5 of Fig. 3.

Referring more in detail to the drawings:

1 designates a portable stove constructed in accordance with the present invention and includes a fount 2 carrying a burner and grid assembly 3. The fount 2 is preferably of dome-like shape and has a base portion 4 and a crowned top 5 having a collar 6 encircling an opening 7. The top 5 also has an annular shoulder 8 forming a seat for a spacing collar 9. The fount also has a fill opening 10 normally closed by a cap 11,

through which a liquid hydrocarbon fuel is poured into the fount and discharged through a tube 12 under air pressure contained in the top of the fount. The fount therefore preferably includes a self-contained pump unit designated 13 located on the side opposite the fill opening.

Threaded into the opening 7 is a fitting 14 which carries the tube 12 and forms a housing for a starting mechanism whereby an atomized mixture is delivered to the burner for starting purposes, the starting mechanism being actuated by a lever 15 extending laterally through an opening in the spacing collar 9. The starting mechanism specifically forms no part of the present invention and may be of any conventional design.

The collar 9 preferably comprises a sheet metal ring having air inlet openings 16 in the side thereof through which air is admitted into a substantially confined space or housing for the fitting 14. The lower edge of the collar seats firmly on the shoulder 8 and is centered thereby to support a base plate 17 on spaced extensions 18 provided at the upper edge of the collar to form air outlets 19 for discharge of warm air so that the top of the fount is adequately protected from the heat of the burner, later described.

The base plate 17 preferably includes a sheet metal disk 20 having an upwardly extending marginal flange 21 to form a shallow, pan-like member adapted to catch drippings and the like, and to cooperate with a central embossed portion 22 in enhancing rigidity of the plate. The base plate is anchored to the fount by bolts 23, having the shanks thereof extending through openings 24 in the plate and into threaded sockets 25 provided in the top of the fount at opposite diametrical sides of the fitting 14. The sockets 25 may be formed by attaching nuts to the fount so that the bolts firmly anchor the base plate and spacing collar to the fount at a plurality of points spaced radially from the axial center of the fount. The base plate is thus stably mounted and rigidly supports the grid later described, in such a manner that there is no strain placed upon any of the fuel connections between the fount and the generator that might cause leaking thereof. For convenience, the side of the plate projecting over the fill opening 10 may be recessed as at 26 so as to facilitate filling of the fount. The spacing collar 9, being of relatively large diameter and firmly seated on the fount, provides a rigid support for the base plate so that the plate may be constructed of relatively thin metal without affecting its rigidity.

The burner is best illustrated in Fig. 4 and preferably includes a unitary casting 27 and which includes a U-shaped Bunsen 28 having upper and lower duct-like arms 29 and 30, the upper arm 29 being of Venturi shape and connected with a box-like mixing chamber 31 projecting upwardly from the lower arm 30. The side walls 32 and 33 thereof are of solid construction and connected by the front and rear walls 34 and 35 having aligning openings 36 and 37 therein. The opening 37 forms a connection with the venturi in the arm 29, while the opening 36 in the front wall is of a diameter to receive snugly the tip 38 of a generator 39, later described. The rear wall terminates short of the upper edges of the side walls to form an air inlet opening 40 to the mixing chamber and which is therefore directed away from the heat of the burner 41 that is connected with the arm 30.

The top of the mixing chamber is closed by a channel-shaped cap 42, preferably formed of sheet metal and having sides 43 and 44 extending downwardly along the sides of the arm 29 to form side channels 45 and 46 having connection over the top of the arm and communicating with the air inlet opening 40, the bottoms of the channels being closed by ribs 47 and 48 extending laterally from the sides of the arm 29 as shown in Fig. 5. The rear ends of the side channels are open and are located a sufficient distance away from the burner that the air intake is substantially out of the heat zone of the burner but in the stream of air moving upwardly at the sides of the stove so that there is a natural circulation of air through the channels into the mixing chamber of the Bunsen.

The cap 42 is secured in position by a screw 49 extending through an opening 50 in the forward end of the cap and into a threaded socket 51 that is formed in a boss 52 on the forward wall of the mixing chamber.

The burner includes a shallow, bowl-shaped body 53 open at the top and having a sump-like chamber 54 in the bottom thereof communicating through an elongated opening 55 with the duct in the arm 30, the duct having gradually flattening cross-section to provide full flow capacity of the venturi and at the same time reduce the overall height of the burner.

Supported circumferentially of the sump 54 is a tier of alternately arranged corrugated and plane rings 56 and 57 forming burner outlets 58. Seated on the upper ring is a closure plate 59 that closes the top of the sump and clampingly retains the rings, the closure plate being retained by screws 60 threaded into bosses 61 formed at the side of the sump-like chamber 54.

The arm 30 has an integral depending leg 62 cooperating with a similar leg 63 on a forward extension 64 of the burner casting to support the burner in spaced relation above the base plate and to form attachments whereby the burner assembly is secured to the base plate by screws 65 extending through openings 66 in the base plate and into threaded sockets 67 provided in the legs 62 and 63 as best shown in Fig. 3. In order to enhance lateral stability of the burner unit, the leg 62 has side wings 68 and 69 with the lower end thereof engaging the top of the plate.

The generator 39 extends diametrically across the top of the burner in axial registry with the Bunsen and carries at its forward end a regulating valve 70. The valve 70 includes a substantially T-shaped body having one branch 71 connected with the generator tube by a union 72 and

the aligning branch 73 carrying a packing assembly 74 for sealing about the stem 75 of the needle member controlling outlet of the generator tip. The stem 75 is threadedly supported in the body of the valve and is actuated by a knob 76. The other branch 77 of the valve body projects downwardly and has a shoulder 78 encircling a reduced threaded extension 79. The extension 79 is received in a notch 80 that is formed in a laterally extending arm 81 of an upward extension 82 of the flange 21, the lateral arm 81 being of sufficient height to align the front end of the generator with the opening 36 when the shoulder 78 is drawn into clamping contact with the arm 81 by a jam-nut 83 which is threaded onto the reduced extension 79. The extension 79 also forms a connection of a flexible duct 84 leading from the fitting 14 and which is connected with the reduced extension 79 by a union 85.

In order to enhance the rigidity of the bracket-like support for the valve under torsional strains incidental to actuation of the knob 76, the arm 81, including the extension portion 82 and flange 21, are provided with spaced ribs 86 and 87. These ribs also preferably extend into the body portion of the base plate as shown at 88. The ribs therefore further enhance the rigidity of the bracket so that it supports the generator tube in proper entering relation with respect to the inlet of the Bunsen.

The grid preferably includes a horizontal top 89 having a periphery 90 formed by a wire bent into star-like shape, the points 91 of which form attachments for radially extending bars 92 having their inner ends terminating short of the center of the stove and interconnected by a wire-like ring 93. Certain of the bars 92 have leg portions 94 extending inwardly and then downwardly as at 95 to terminate in threaded ends 96 mounting stop nuts 97. The threaded ends 96 of the legs 94 extend through openings 98 in the base plate and are provided with nuts 99 cooperating with the nuts 97 to anchor the grid securely on the base plate and cooperate therewith in providing a cage-like structure enclosing and protecting the parts of the burner including the generator tube assembly. The grid structure including the leg portions also form a truss-like support, enhancing the rigidity of the plate so that the plate accurately retains the burner and generator parts in their proper alignment.

The arrangement whereby the generator and burner units are mounted on the base plate permits use of a fitting 14 having pipe threads so that the fitting may be tightened sufficiently to prevent leakage from the top of the fount without the use of gaskets, and the variable makeup incidental to the threads does not interfere with assembly of the stove parts since the valve connections are supported by a part of the base plate and connected with the fitting through the flexible duct 84.

When the burner is in operation air naturally moves from around the bottom of the stove upwardly along the sides thereof so that the relatively cool air is drawn through the air inlet openings and into the mixing chamber for mixture with the vaporized fuel discharged from the generator. With this arrangement an adequate supply of air is provided to maintain proper combustion and operation of the burner.

From the foregoing it is obvious that I have provided an exceptionally strong, rigid and light weight stove construction wherein the parts may be accurately assembled and any variable make-

up incidental to the threaded connection of the fitting 14 is compensated for through the flexible connection 84.

What I claim and desire to secure by Letters Patent is:

1. A stove of the character described including a fount, a base plate, a spacing collar seated on the fount and supporting the base plate to form a substantially enclosed air space below said base plate, means anchoring the base plate and the spacing collar to the fount, a fitting in said space and having rigid connection with the fount, a burner having rigid support on the base plate and provided with a Bunsen, a generator tube having a tip discharging into the Bunsen, means carried by the Bunsen for centering the tip of the generator tube, a valve fixed to the opposite end of the generator tube, a bracket on the base plate supporting the valved end of the generator tube, means anchoring the generator tube to the bracket for maintaining the generator tube in aligning registry with the centering means, and a flexible duct connecting the fount fitting with the valve.

2. In a stove of the character described, a burner assembly including a Bunsen comprising a substantially U-shaped member having one arm connected with the burner and the other arm forming a venturi, a mixing chamber connected with the venturi and having a closed side adjacent the burner provided with an opening registering with the venturi, said mixing chamber having an air inlet on the opposite side and directed away from the burner, and a generator tube having a discharge tip supported in said opening and directed into the venturi.

3. A stove of the character described including a fount, a base plate, a spacing collar seated on the fount and supporting the base plate to form a substantially enclosed air space below said base plate, means anchoring the base plate and the spacing collar to the fount, a fitting in said space and having threaded connection with the fount, a burner having rigid support upon the base plate and provided with a Bunsen, a generator tube having a tip discharging into the Bunsen, means rigidly mounting the generator tube on the base plate to support said tip in fixed alignment with the Bunsen, and a flexible duct connecting the fount fitting with the valve to compensate for variable makeup in said fitting with respect to its threaded connection with the fount.

4. In a stove of the character described, a burner assembly including a Bunsen having a duct connected with the burner of said assembly, a mixing chamber connected with the Bunsen

and having a closed side adjacent the burner provided with an opening, and a generator tube supported in said opening, said mixing chamber having an air inlet on the opposite side above the discharge from the generator tube.

5. In a stove of the character described, a burner assembly including a Bunsen comprising a substantially U-shaped member having one arm connected with the burner and the other arm forming a venturi, and a mixing chamber connected with the venturi and having a closed side adjacent the burner provided with a generator opening registering with the venturi, said mixing chamber having air channels on opposite sides of the venturi and having inlets directed away from the burner.

6. In a stove of the character described, including a fount forming a base, a plate having fixed support on the fount and provided with a flanged marginal edge, a burner assembly having a fixed support upon the plate, said burner assembly including a Bunsen having a generator tube receiving opening therein, a generator tube having a tip received in said opening, a bracket on the plate formed as an upward extension of said flange and having a laterally extending arm terminating in a bifurcated portion, a valve having rigid connection with the generator tube and provided with a shouldered threaded neck engaged in the bifurcation of said arm, a flexible tube connecting the threaded neck of the valve with the fount, and a jam-nut threaded on said neck for drawing the shoulder of the valve into clamping engagement with the arm of the bracket, whereby the generator tube is supported in alignment with said opening of the Bunsen.

7. In a stove of the character described, a base member including a fount and a plate having fixed support on the fount, a fitting having threaded connection with the fount, a burner assembly having legs fixed to the plate for supporting said burner assembly above the plate, said burner assembly including a unitary Bunsen having a generator tube supporting opening therein, a generator tube having a tip supported in said opening, a valve having rigid connection with the generator tube, a bracket on the plate formed as an upward extension at the marginal edge of the plate and having a laterally extending arm supporting the valved end of the generator tube in alignment with said opening of the Bunsen, means anchoring the valve to the arm of the bracket, and a flexible duct connecting the fitting with said valve.

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