Nov. 10, 1964 G. F. CORLET 3,156,379

STOVES AND LIKE APPARATUS OPERATING WITH LIQUEFIED GAS

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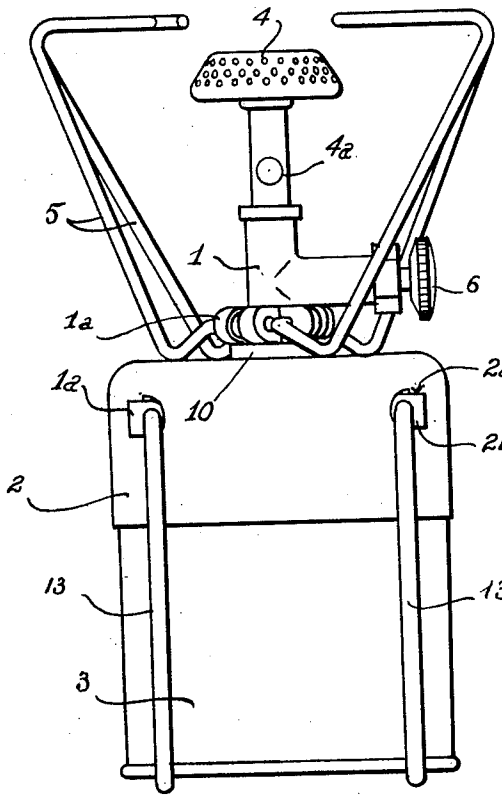



Fig. 1

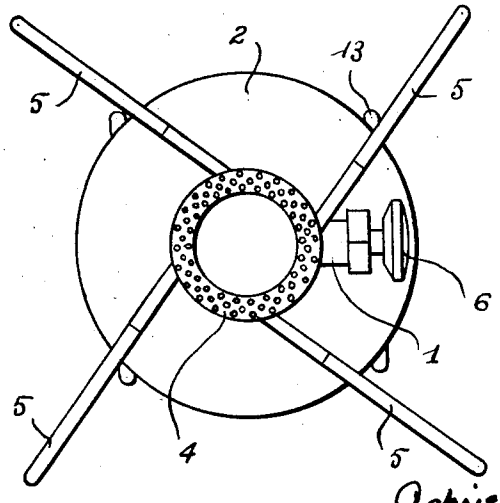



Fig. 2

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Fig. 3

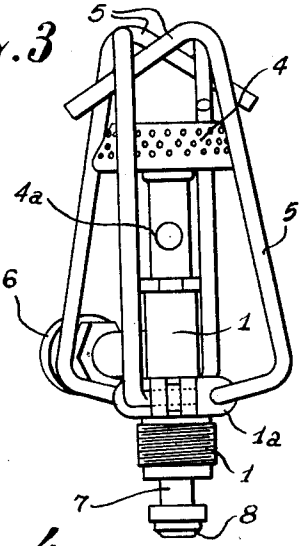



Fig. 7

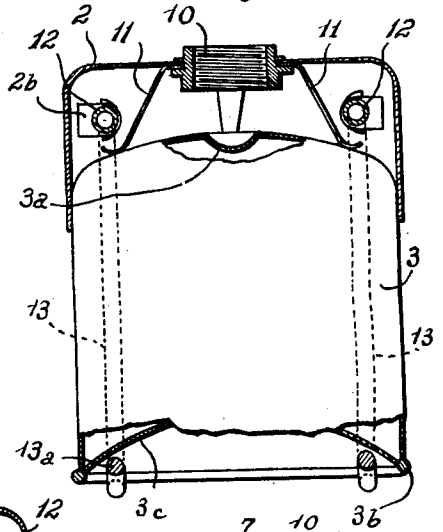
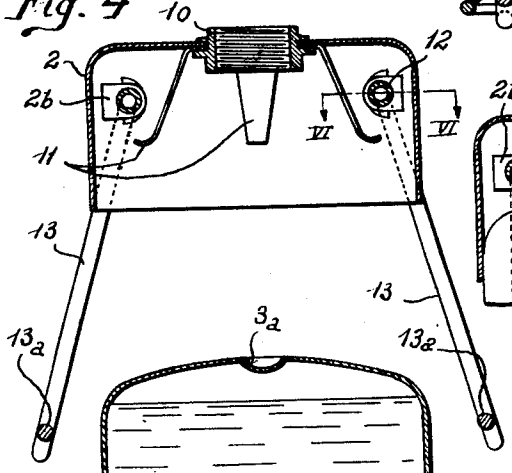



Fig. 4



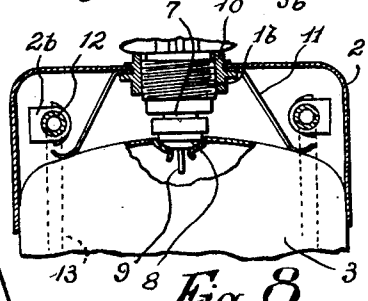




Fig. 8

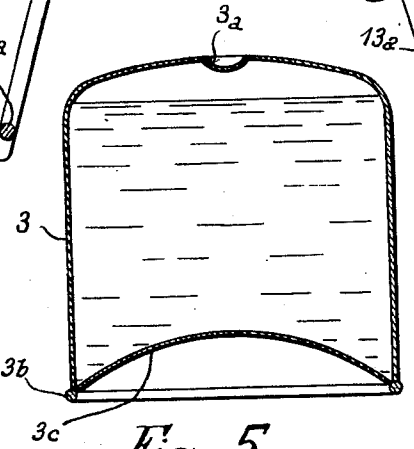



Fig. 5

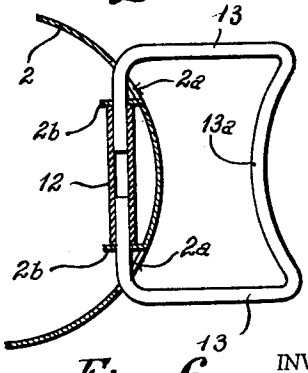



Fig. 6

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3,156,379

# STOVES AND LIKE APPARATUS OPERATING WITH LIQUEFIED GAS

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Claims priority, application France, Apr. 28, 1961, 41,520
6 Claims. (Cl. 222—5)

This invention relates to improvements to portable apparatus such as stoves, lamps, heating radiators, blow-torches, &c. of the kind using as fuel a gas liquefied under pressure within a non-refillable container or cartridge adapted to be rejected after use.

In known apparatus of this kind the cartridge is carried by an intermediate support in which is screwed a gas-intake head comprising a perforating needle surrounded by an axially movable and/or deformable sealing member, in such a manner that when the said head is being screwed into the intermediate support, its longitudinal displacement causes application of the said sealing member against the wall of the cartridge and thereafter perforation of the said wall by the needle, any gas leak being thus prevented during the perforating operation. Such an arrangement is described in U.S. Patents 2,853,126 and 2,890,815.

It is essential in such apparatus that once the cartridge is perforated it cannot be inadvertently liberated from the intermediate support, since its content would then exhaust into the surrounding atmosphere in the form of a highly inflammable and dangerous gas.

The present invention has for its object to provide an apparatus of the kind in question wherein the gas cartridge will be quite firmly and securely retained in the intermediate support, as long as the gas-intake head is not unscrewed from the said support.

Another object of the present invention is to provide an apparatus which may use gas cartridges of increased height and consequently of increased capacity.

In accordance with the present invention the cartridge is retained in the intermediate support against the action of the gas-intake head applied downwardly against the upper wall of the said cartridge, by engagement of the concave bottom of the cartridge against the lower transverse branch of stirrups hinged to the intermediate support, the said branch having an inwardly projecting portion which prevents the stirrups from being swung aside before the pressure of the gas-intake head against the cartridge is released.

Each stirrup is preferably made of a U-shaped wire or rod, the ends of which are bent towards each other and are passed through appropriate inner lugs of the intermediate support and engaged into a sleeve disposed between the said lugs.

In the annexed drawing:

FIG. 1 is a side view of a portable stove according to the present invention.

FIG. 2 is a plan view thereof.

FIG. 3 is a sectional view of the gas-intake head with the burner of the stove mounted thereon, the utensil supporting arms being shown at the folded position.

FIG. 4 shows the intermediate support of the gas cartridge with the cartridge-retaining stirrups swung apart to receive the cartridge.

FIG. 5 is a sectional view of the cartridge.

FIG. 6 is a fragmental section taken through line VI—VI of FIG. 4.

FIG. 7 is a sectional view showing the gas cartridge mounted in the intermediate support, before the gas-intake head is screwed into the said support.



FIG. 8 is a fragmental section of the apparatus after the gas-intake head is fully screwed down into the intermediate support.

The stove illustrated in FIGS. 1 and 2 comprises three main elements, namely a gas-intake head 1, an intermediate support 2 and a gas cartridge 3.

As more particularly illustrated in FIG. 3 the gas-intake head 1 carries an upper burner 4 having a tubular base provided with lateral perforations 4*a* forming air inlets. Four lateral bosses 1*a*, integral with the gas-intake head itself, pivotally carry the ends of four rods appropriately bent to form utensil supporting arms. FIG. 3 shows the said arms at the folded position, while in FIGS. 1 and 2 they have been unfolded, their lowermost portion resting against the upper side of the intermediate support 2. The gas-intake head 1 further comprises a gas cock with an actuating button 6. As in the above-mentioned patents head 1 is formed with a downwardly opening inner bore in which is slidably disposed a piston having a downwardly extending tubular rod 7, the free lower end of which carries an annular sealing member 8, the said piston being urged outwardly by appropriate spring means. The gas-intake head 1 further comprises an inner perforating needle 9 (see FIG. 8) which terminates well above member 8 at the position of rest of the said head, i.e. when same is not applied against a gas cartridge. Head 1 has a lower screw-threaded portion 1*b*.

The intermediate support 2 (FIG. 4) is in the form of an inverted cup. The horizontal wall or bottom of ths cup-shaped member has a central hole in which is secured an internally threaded ring 10 adapted to receive portion 1*b* of the gas-intake head. Ring 10 further clamps against the inner side of support 2 a spring member comprising three radially and downwardly projecting blades 11. The cylindrical wall or skirt of support 2 has four punchings 2*a* which determine lugs 2*b* (FIG. 6) the latter being pierced and bent inwardly so as to form two pairs with the lugs of each pair parallel to each other, their holes being disposed along a common axis perpendicular to the lugs of the pair under consideration. Between the lugs 2*b* of each pair is disposed a sleeve 12, preferably made of a plastic material, into which are engaged as a close fit the ends, bent towards each other, of a stirrup 13 made from a rod or wire. As illustrated in FIG. 6, the said ends are passed through the punchings 2*a* and through the corresponding lugs 2*b*, the stirrup being thus hingedly carried by support 2. Each stirrup 13 comprises two straight lateral branches and an inwardly curved transverse branch 13*a*.

The non-refillable cartridge 3 is formed of a cylindrical container having an upwardly bulging upper end provided with a central depression 3*a* adapted to receive the sealing member 8 carried by the gas-intake head 1. The lower edge of the cylindrical wall of cartridge 3 is reinforced by a bead 3*b*, and the lower end or bottom 3*c* is concave or, in other words, bulges inwardly, as clearly shown in FIG. 5.

For mounting a fresh cartridge in the stove, the gas-intake head 1 is first unscrewed from the intermediate support 2 and the stirrups 13 of the latter are swung apart, as shown in FIGS. 4 and 5. The fresh cartridge 3 is then received into support 2 and is forced upwardly against the action of spring blades 11. Stirrups 13 are then swung inwardly, whereby their transverse branches 13*a* are brought below the lower end of the cartridge. When the latter is released it is pressed downwardly by spring blades 11 against the said branches 13*a* (position of FIG. 7) which thus retain the cartridge in the support. The gas-intake head 1 is then screwed into

ring **10**. The lower sealing member **8** is first applied against the upper end of the cartridge within depression *3a* which acts as a centering means. The tubular rod **7** and the inner piston carried thereby are then progressively forced inwardly against the action of the inner spring, as fully explained in the above mentioned patents, and the inner needle **9** perforates the upper end of the cartridge, any gas leak being fully prevented by member **8**. When the gas-intake head is fully screwed down, its inner spring is almost fully compressed and the cartridge is strongly pressed against the lower transverse branches **13***a* of stirrups **13**. The latter are then locked in position since for swinging them aside to liberate the cartridge **3** from the intermediate support **2**, it would be necessary to displace the cartridge upwardly in order that the upwardly projecting central portions of branches **13***a* may pass under the lower peripheral bead *3b* of cartridge **3**, which is quite impossible, the inner spring of the gas-intake head permitting no noticeable upward displacement of rod **7**, i.e. of the cartridge itself.

The cartridge cannot therefore be removed before the gas-intake head **1** is again unscrewed from ring **10**.

It will be observed that stirrups **13** may be made of such a length as to receive gas cartridges of any desired height.

I claim:

1. A portable apparatus of the kind using a liquefied combustible gas comprising a substantially cylindrical gas cartridge having a first end and a second end, with said second end having a recess therein defining an inner space; a support in the form of an inverted cup to receive the first end of said cartridge, the bottom of said support having a substantially central hole; spring means within said support to bias said cartridge outwardly; stirrups hinged to said support, each comprising two substantially parallel spaced lateral branches and a transverse branch disposed under the second end of said cartridge to retain the first end of same in said support against the action of said spring means, said transverse branch having an inwardly projecting portion which extends into the inner space defined by said recessed second end of said cartridge, so that said stirrups cannot be swung outwardly to liberate said cartridge without first displacing said cartridge axially towards said support against said spring means; a gas-intake head removably securable in the central hole of said support to be pressed against the first end of said cartridge, said gas-intake head embodying inner piercing means to establish gas communication between said cartridge and said head, and annular sealing means to establish gas-tight contact between said head and said first end around said piercing means, the pressure exerted by said head against the first end of said cartridge maintaining the second end thereof positively engaged against the transverse branch of said stirrups.

2. A portable apparatus as claimed in claim 1, wherein said second end of said cartridge is of inwardly bulging shape and said transverse branch of each of said stirrups is of inwardly arcuate shape.

3. A portable apparatus as claimed in claim 1, wherein said second end of said cartridge is of inwardly bulging shape and has an outwardly projecting peripheral bead, and wherein said transverse branch of each of said stirrups is of inwardly arcuate shape.



4. A portable apparatus of the kind using a liquefied combustible gas comprising a substantially cylindrical gas cartridge having a first end and a second end; a support in the form of an inverted cup to receive said first end of said cartridge, said support being formed of a bottom and of a substantially cylindrical wall, said bottom having a central hole therein and said cylindrical wall having a plurality of pairs of inwardly projecting perforated lugs obtained by incompletely cutting openings in said cylindrical wall of said support, with the lugs of each pair substantially parallel to each other and having their respective perforations substantially situated along a common axis perpendicular to the geometrical axis of the cylindrical wall of said support; spring means within said support to bias said cartridge outwardly; stirrups hinged to said support, each comprising a transverse branch disposed under the second end of said cartridge to retain the first end thereof in said support against the action of said spring means, and two substantially parallel spaced lateral branches disposed outside of the cylindrical wall of said support, each having at its end farther from said transverse branch a portion bent substantially at right angles, with the bent portions of said lateral branches directed towards each other and passing through the openings in the cylindrical wall of said support corresponding to one of said pairs of lugs and through the perforations of the lugs of said one pair.

5. A portable apparatus as claimed in claim 4, wherein the bent ends of each of said stirrups is engaged into a sleeve made of a plastic material and disposed between the lugs through which said last-named bent ends are passed.

6. A portable apparatus of the kind using a liquefied combustible gas comprising a substantially cylindrical gas cartridge having a first end and a second end, with said second end of recessed shape defining an inner space; a support in the form of an inverted cup to receive the first end of said cartridge; stirrups hinged to said support, each comprising two substantially parallel spaced branches and a transverse branch cooperating with the second end of said cartridge to retain the first end thereof engaged in said support, said transverse branch having an inwardly projecting portion which extends into the inner space defined by said recessed second end of said cartridge; and means on said support to act on the upper end of said cartridge to positively apply the lower end thereof against the transverse branch of each of said stirrups to latch the inwardly projecting portion of said transverse branch in the inner space defined by the recessed second end of said cartridge and to thereby prevent said stirrups from being swung outwardly to liberate said cartridge.


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