

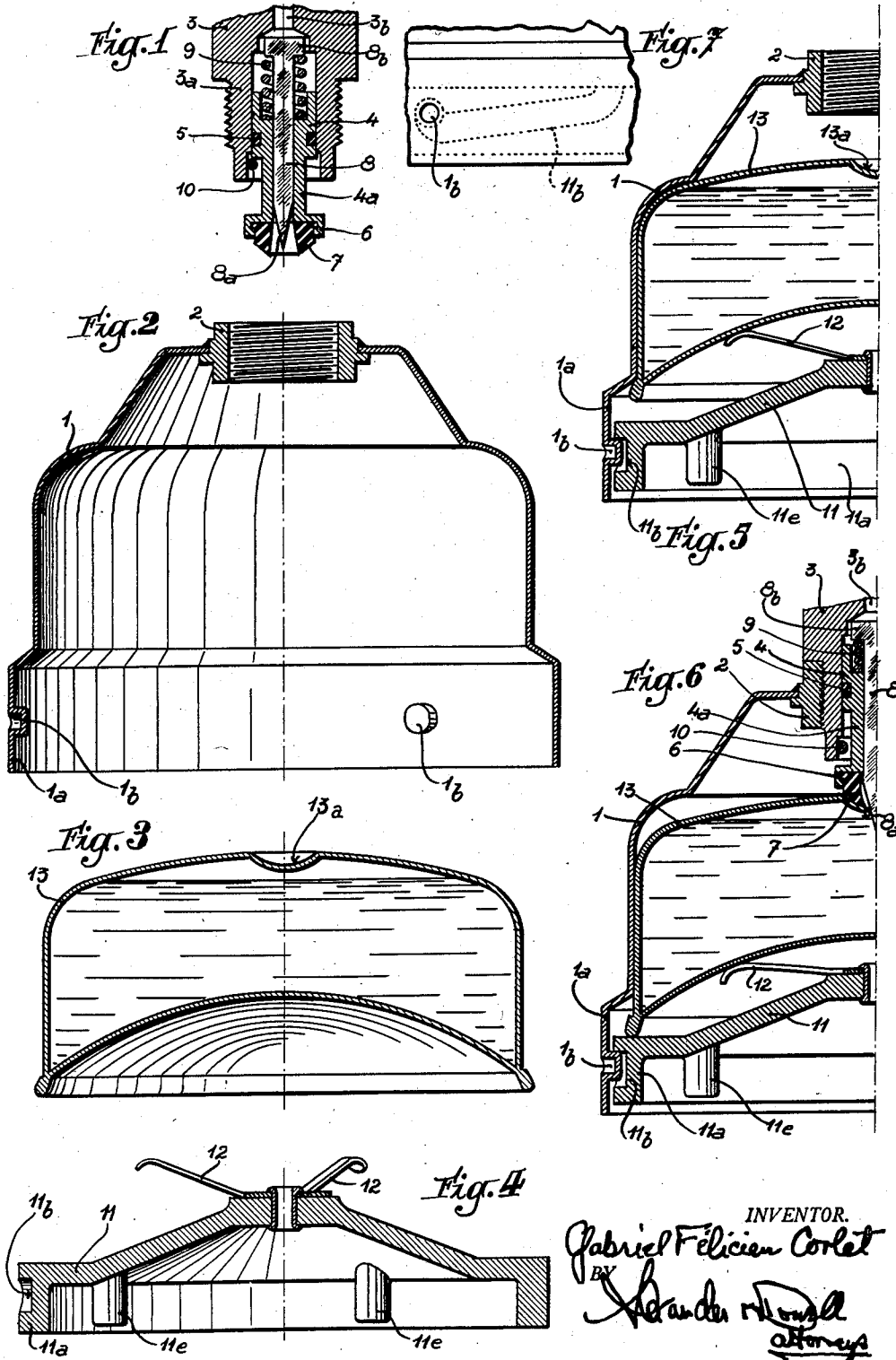
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G. F. CORLET

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STOVES AND LIKE APPARATUS USING LIQUEFIED GAS

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INVENTOR.
Gabriel Felicien Corlet
BY
Alexander M. [Signature]
Attorneys

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STOVES AND LIKE APPARATUS USING LIQUEFIED GAS

Gabriel Félicien Corlet, Pierre-Benite, France, assignor to Société d'Application des Gaz, Produits Routiers et Matériaux, a French joint-stock company, Paris, France

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1 Claim. (Cl. 222—5)

The present invention refers to apparatus, such as portable stoves, heating radiators, blow torches and the like, which use a combustible gas liquefied under pressure and wherein the said gas is contained in an easily replaceable fuel cartridge.

The invention more particularly relates to apparatus of the kind described in my prior U.S. Patent 2,853,126, and wherein the cartridge is in the form of a mere tin can without any neck, nozzle or like connecting device, the connection between the said can and the gas intake head of the apparatus being effected by perforating the wall of the can within an annular seal applied against the said wall under a sufficient pressure for avoiding gas leakage. This arrangement permits of using quite inexpensive cartridges which may be considered as non-refillable containers adapted to be rejected after use.

In this type of apparatus the cartridge is removably mounted in a support or cartridge container adapted to receive the gas-intake head and it is retained therein against the pressure of the annular seal against its wall by pivoted clips which are engaged under the lower edge of the cartridge. In the case of a camping stove the said clips are thereafter locked in position by an outer cylindrical casing adapted to support the cooking utensils, whereby the clips are prevented from becoming disengaged from the cartridge. But in the case of a blow torch, of a lamp or other similar apparatus, such a cylindrical casing is not provided and moreover even with a camping stove the casing may itself become disengaged from the support, as for instance in a knapsack, or a clumsy operator may release the clips before the cartridge is fully exhausted.

A first object of this invention is to provide a small portable gas apparatus wherein the replaceable cartridge will be safely retained within the corresponding support or container and will not be liable to become accidentally disengaged therefrom, even if the apparatus is uncarefully handled.

Still a further object of this invention is to provide a small portable gas apparatus wherein the cartridge cannot be removed from the corresponding support or container once the wall of the said cartridge has been perforated and until it is fully exhausted.

According to the present invention the support or cartridge container has a removable cover adapted to retain the cartridge against the pressure of the annular seal, which cover is assured in position in the support or container by means of a bayonet joint in such a manner that when the annular seal has been applied against the cartridge, the said cover is locked in the support and cannot be removed therefrom until the pressure of the annular seal against the cartridge is released.

The cover preferably carries a spring which maintains the cartridge pressed against the end of the support or container opposed to the said cover and at the same time ensures proper engagement of the bayonet joint, until the gas intake head is mounted into the support and

presses the cartridge against the cover against the action of the said spring.

Before mounting a fresh cartridge, the gas-intake head should be removed from the support or container. The cartridge is then introduced into the latter and the cover is placed. Owing to the presence of the spring, the bayonet joint snaps into position. The gas intake head is then mounted into the end of the support or container opposed to the cover, as for instance by screwing. The annular seal is thus applied against the wall of the cartridge and the latter is progressively pressed against the cover against the action of the spring which becomes fully deflected. The perforating needle then punctures the cartridge wall whereby gas may flow into the apparatus. The cartridge then rests on the cover and the bayonet joint is locked. When the cartridge is exhausted, the gas-intake head may be removed from the support or container, whereby the cartridge will be free to move axially within the support under the action of the spring. The bayonet joint may then be operated to remove the cover.

The bayonet joint conveniently comprises inner gudgeons in the periphery of the support or gas cartridge container and slots in the periphery of the cover.

In the annexed drawings:

Figs. 1 to 4 are sectional views respectively showing the lower or tail portion of the gas-intake head, the support or gas-cartridge container, the gas cartridge, and the cover of the support.

Fig. 5 is a fragmentary view showing the gas-cartridge mounted in the support before the gas-intake head is screwed down into the latter.

Fig. 6 is a view similar to Fig. 5, but showing the parts after the tail portion of the gas intake head has been screwed down into the support.

Fig. 7 is a fragmentary side view showing a portion of the lower edge of the support or gas-cartridge container.

The apparatus illustrated comprises a bell-shaped member or support 1 opening downwardly and having a frusto-conical upper end which carries a vertical screw-threaded sleeve 2 co-axially disposed with respect to the said support. This sleeve 2 is adapted to receive the screw-threaded lower end or tail portion 3a of a gas-intake head 3. The tail portion 3a is bored and it slidably encloses a piston 4 provided with a sealing ring 5. Piston 4 is formed with a tubular rod 4a terminating in a downwardly opening cup 6 which carries a ring 7 made of rubber or like material, the said ring projecting downwardly from cup 6, as shown. A needle 8 is disposed within the tubular rod 4a, co-axially to the latter, the end 8a of the said needle being normally above the lower end of ring 7, as indicated in Fig. 1. Needle 8 is non-circular or flat in cross-section and it is formed with a flat T-shaped head 8b which is retained against the bottom of the bore of the tail portion 3a by a strong inner spring 9 mounted on needle 8 between the said head 8b and the above-described piston 4. The downward stroke of the movable assembly or gas-intake member comprising piston 4, rod 4a, cup 6 and ring 7 is limited by a pin 10 transversely driven through the lower end of the tail portion 3a at a distance from the axis thereof to form an abutment for piston 4 without hindering the free movement of rod 4a. A gas passage 3b opens in the bottom of the bore of the tail portion 3a.

The support 1, which is made of sheet metal, has a downward extension 1a of larger diameter than the remainder of the said support and in this extension there is formed a number of cylindrical depressions 1b which determine inwardly projecting hollow cylindrical

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pins. These pins are three in number in the example illustrated and they are equally spaced along the inner periphery of extension 1a.

The above described extension 1a is adapted to receive a lower circular cover 11 (Fig. 4) formed with a cylindrical edge 11a the outer periphery of which has three bayonet slots 11b. As shown in Fig 7 each slot 11b opens on the upper side of cover 11, it extends obliquely and downwardly and terminates in a blind upwardly directed end. These slots 11b are of course so arranged as to cooperate with the inward pins formed by the depressions 1b. The cover 11 carries on its upper side a number of resilient blades 12. The lower side of cover 11 is formed with actuating knobs 11e.

The apparatus described is adapted to receive gas cartridges 13 (Fig. 3) formed of a cylindrical container made of thin sheet metal. The upper end of this cartridge is convex while its lower end is concave, or, in other words, both ends are bulging upwardly. The upper end has a central semi-spherical depression 13a.

The cartridge 13 is introduced into the support or cartridge container 1 before the gas-intake head 3 is screwed onto the latter. The cover 11 is then inserted into the lower end of the support, whereby the spring blades 12 push the cartridge against the rounded shoulder which connects the cylindrical side of the said support with the frusto-conical upper end thereof. The cover is then pressed for engaging the pins 1b of the bayonet joint into the corresponding slots 11b against the reaction of the spring blades 12, and it is rotated until the said pins snap into the ends of the slots (position of Fig. 5).

The tail portion 3a of the gas-intake head 3 is then screwed down into the sleeve 2. The sealing ring 7 is first brought into engagement with the central depression 13a of the upper end of the gas cartridge 13. Since the spring blades 12 are relatively light with respect to the inner spring 9 of the gas-intake head, the cartridge is first lowered by the action of the sealing ring until its lower peripheral edge rests against the upper side of cover 11. Further rotation of the gas-intake head 3 then causes compression of the inner spring 9, whereby the contacting pressure between the sealing ring 5 and the depression 13a is considerably increased and becomes sufficient for ensuring a gas-tight seal. The perforating needle thereafter punctures the center of the depression 13a (position of Fig. 6) and the gas under pressure may flow towards the burner (not illustrated) of the apparatus through the conventional controlling valve.

It will be appreciated that when the tail portion 3a of the gas-intake head 3 has been fully screwed down into the sleeve 2, the inner spring 9 is almost fully compressed and therefore the pins 1b of the bayonet joint are locked in the raised ends of the slots 11b, since it is then im-

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possible to push the cover 11 inwardly to any noticeable extent. The cartridge is not therefore liable to be accidentally released either under the effect of shocks or vibrations, or due to any mishandling.

When the cartridge is exhausted, the operator first unscrews the gas-intake head 3 and thereafter removes the lower cover 11, the bayonet joint then being disengageable since the exhausted cartridge has again been raised by the spring blades 12.

I claim:

In a portable stove or like apparatus using a combustible gas in liquefied form, a gas cartridge in the form of a sealed cylindrical can made of a perforatable material and containing the liquefied gas, said gas-cartridge having a concave lower end; a gas-cartridge container in the form of a hollow cylindrical body having a substantially frusto-conical upper end and an open lower end, the smaller base of said frusto-conical upper end having a screw-threaded portion substantially co-axial to said upper end, and the inner periphery of said open lower end being formed with bayonet-joint elements; a cover adapted to be mounted in the open lower end of said gas-cartridge container, the outer periphery of said cover being formed with bayonet-joint elements adapted to co-act with the bayonet-joint elements carried by the inner periphery of the open lower end of said gas-cartridge container to secure said cover in said lower end; a gas-intake head having a screw-threaded portion adapted to be screwed into the screw-threaded portion of the upper end of said gas-cartridge container; perforating means carried by said gas-intake head to perforate said gas cartridge within said gas-cartridge container, said perforating means having a non-circular cross-section to provide gas passage between same and the edge of the circular hole formed in said gas cartridge under the action of rotation of said perforating means with respect to said cartridge when said gas-intake head is screwed down into the upper end of the screw-threaded portion of said gas cartridge container; annular sealing means carried by said gas-intake head co-axially to said perforating means to be tightly applied against said gas cartridge to press same against said cover and to lock said bayonet joint; and spring means carried by said cover and acting on the concave lower end of said gas cartridge to urge said gas cartridge against the frusto-conical upper end of said gas-cartridge container, said spring means being adapted to be compressed when said gas-intake head is screwed on said gas-cartridge container until the lower edge of said gas cartridge rests against said cover.

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