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M. QUERCIA ET AL
LIGHTER USING A GASEOUS FUEL

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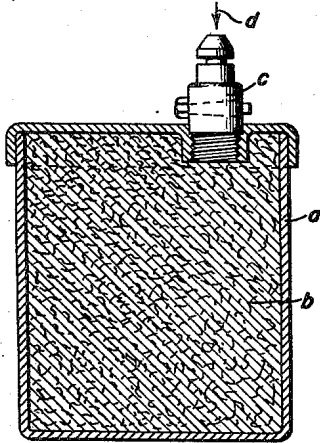


Fig. 1.

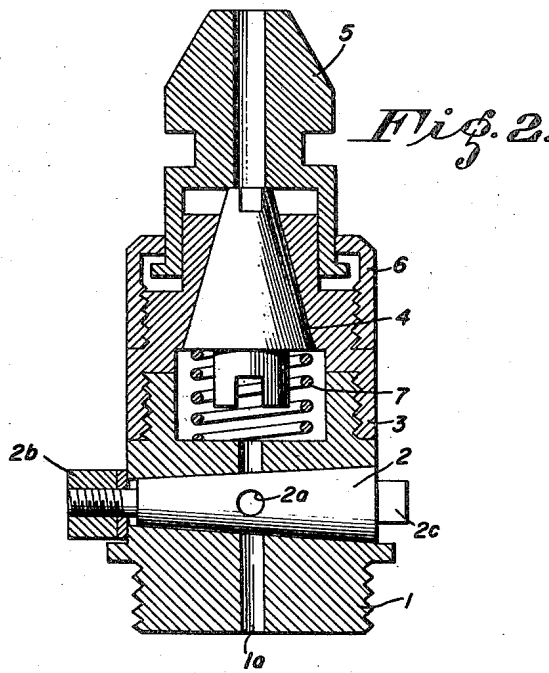


Fig. 2.

Fig. 3.

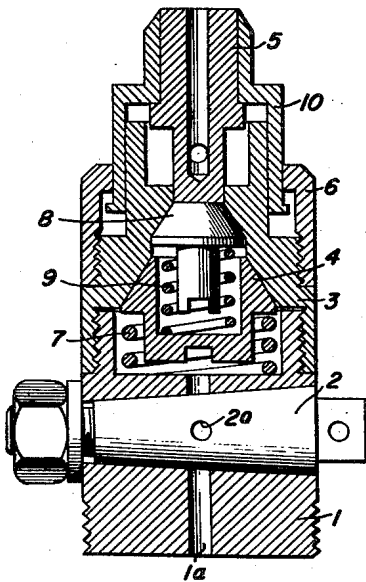
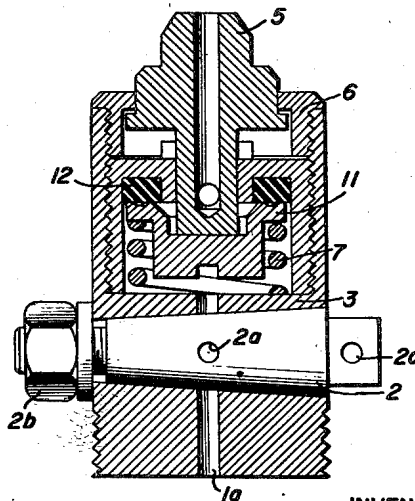


Fig. 4.



INVENTORS

MARCEL QUERCIA
GEORGES FERDINAND

BY

Michael J. ...

UNITED STATES PATENT OFFICE

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LIGHTER USING A GASEOUS FUEL

Marcel Quercia, Paris, and Georges Ferdinand,
Nogent-sur-Marne, France

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5 Claims. (Cl. 67-4)

1 This invention relates to lighters or ignition devices, in which the flame is obtained by the combustion of a gas, whether stored in the gaseous state, or produced by the expansion of a gas which is compressed or liquefied.

Among the lighters of the latter kind, there are some which obtain this expansion by means of expansion valves, preferably multiple or effecting a plurality of successive expansions, often with special intermediate fittings, generally comprising porous or pulverulent matter. There are also some which comprise the use, in the container itself of the apparatus, of an absorbing support, mineral or organic, which may have been preliminarily subjected to any suitable physical or chemical treatment, and which absorbs the liquefied or gaseous fuel employed and ensures in this manner directly, by its action itself, a first release of pressure of this gas in the container. With an apparatus of this kind, it suffices then of a simple adjusting member for the flow of gas, such as a tap, a needle valve, a calibrated passage, etc. . . . in order to obtain immediately the gas at its utilization pressure; these apparatus are therefore doing away with all particular and complicated devices for multiple or successive expansion, as well as with all intermediate expansion members and subdividing fittings.

The improvements which constitute the object of the present invention concern particularly the lighters, using gaseous fuels, belonging to this latter type, in which the gas container comprises internally an absorbing support permitting the storage of the liquefied or gaseous fuels employed under reduced pressure and ensuring in this manner directly its release under a limited pressure.

According to our invention, we provide a lighter of this type, comprising, in combination with the container provided with an absorbing support, a member for the adjustment of the gas-flow, suitably associated with a particular closure member for the burner. The member for the regulation of the flow, such as a tap, threaded needle valve or analogous device, will ensure a mechanical regulation, performed either once for all or as may be required, for the purpose of obtaining a determined length of flame; it permits to effect the initial adjustment on the apparatus at the time of the manufacture itself, or when the system is being placed in position on the container of the lighter, after the latter has been filled. The closure member, for example a clack valve, whether simple, or double as a

2 safety measure, ensures a perfect gas-tightness of the closure when the apparatus is not in use, while leaving an easy passage for the expanded gas, for the working of the lighter.

5 The whole of the combined regulation and closure device which is adapted to be fixed directly on the container of the lighter, may be constructed in practice so as to have a very small bulk, so that it takes very little space.

10 Referring to the appended drawing, which shows the preferred construction of the improvements which constitute the object of the invention, applied to a lighter using gaseous fuel.

15 Fig. 1 of this drawing is a diagrammatic view of the whole of the lighter comprising the present improvements.

Figs. 2, 3 and 4 represent, in vertical sections, three alternative constructions of the combined regulation and closure arrangement.

20 As is seen on Fig. 1 of the drawing, the lighter provided with the present improvements, comprises a filling of absorbing matter *b* placed inside the container *a*. On the container is mounted besides, in a manner which will be described later, the combined regulation and closure device *c*, on which a suitable control, acting for example downward in the direction of the arrow *d*, is adapted to act to produce the opening.

25 In the construction shown on the Fig. 2, the combined arrangement for the regulation and the closure, designated as a whole by *c* on the Fig. 1, comprises a body *1* provided axially with a passage *1a* and terminated at its base by a threaded portion adapted to be screwed on the cover of the container (*a*, Fig. 1) of the lighter. In this body is provided a conical ground seat on which fits a rotary conical key *2*, suitably bored to provide a passage *2a* and constituting a regulating tap. A nut *2b* secures in a known manner the key in its housing and, at its opposite extremity, this key comprises a suitable operating member *2c*, such as a slot for a screw driver, a nipple with holes for a pin, or a square head for a spanner or like device, so as to allow the required adjustment of the regulation tap. On the body *1* another member, namely the body of the clack valve *3*, is adapted to be screwed; it is terminated at its upper portion by a conical ground seat against which bears the conical member of the closure valve *4* which a spring *7* constantly presses upwards against its seat. On this valve body *3* fits with an easy sliding fit the cylindrical base of the burner *5*, guided and maintained in position on the body of the valve by a retaining collar *6*, screwed on the said body.

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It will be understood that the adjustment of the key 2 of the regulation tap can be performed very easily from the outside, either once for all or as may be required for each particular case, once the arrangement is assembled and placed in position on the container of the lighter, so that the gas, a reduction in the pressure of which has preliminarily taken place by the action of the absorbing support filling the inside of container, will in this manner be brought down in one operation to the small pressure at which it can conveniently be discharged to the exterior by the orifice of the burner. A descending motion of the burner, caused manually, pushes downwards the closure cone 4 which, compressing the spring 7, leaves a sufficient passage to allow the free arrival of the gas to the burner. As soon as the control action ceases on the burner, the spring 7 brings back the cone of the closure valve in contact with its seat and the passage of the gas is in this way immediately stopped.

In the construction shown on the Fig. 3, the general arrangement is the same and the same parts have been designated by the same reference numbers as in the preceding example (Fig. 2). Here, however, above the cone 4 of the clack valve is disposed a second cone 8, which a spring 9 pressing against the bottom of the first cone, tends to push back upon its seat. The body 3 comprises to this end two conical superposed seats for these two cones. The burner 5, besides, is housed with an easy sliding fit inside a support 10, the upwards motion of which is limited by its lower flange abutting against the retaining collar 6. The working of this arrangement is the same as that of the preceding arrangement, except that here the gas-tightness of the closure is ensured, even in case one of the cones of the clack valve should fail to operate.

The arrangement shown on Fig. 4 is essentially the same as that of Fig. 2 except that here the cone of the clack valve is replaced by a flat clap 11 with a circular groove, adapted to act in connection with a plastic joint 12, for example of synthetic india-rubber, which will allow to obtain a perfect gas-tightness at the closure, while only requiring a relatively small displacement for the opening.

These combined regulating and closure arrangements, consisting entirely of mechanical members, can be manufactured in large quantities and with the greatest precision. Their mounting by simple screwing on the container of the lighter is most easy; their regulation is mechanical and simple and can be done once the lighter filled. Also, the system is robust and, once suitably adjusted, is free from any subsequent troubles. Finally, the utilization of an absorbing support in the container of the lighter, ensuring the storage of gas under reduced pressure, allows of the use of containers with walls of relatively small thickness, whence diminution of weight and elimination of any danger of explosion.

The ignition system used for the inflammation of the gas issuing at the burner may be of any known or suitable type and may be obtained for example by ferro-cerium, by platinum wire or moss, by means of an electric current, etc.

It goes without saying that the details of execution which have been shown and which have been described above have only been so as examples of realisation of the invention without limitation of the scope of the latter, as defined by the following statement of claims.

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What we claim is:

1. In a lighter using a compressed gas as fuel and having a closed container for the gas provided with an exit for the gas, in combination: means for regulating the rate of discharge of the gas arranged immediately above the exit of the container; means for sealing and opening the flow of gas from the container, said sealing and opening means being arranged so as to immediately follow said regulating means and forming with same a single unit fixed on the container at the gas exit; means adapted to be handled manually for adjusting said regulating means; and an operating member arranged slidably on top of said unit and controlling said opening and sealing means.

2. In a lighter using a compressed gas as fuel and having a closed container for the gas provided with an exit for the gas, in combination: means for regulating the rate of discharge of the gas arranged immediately above the exit of the container; means for sealing and opening the flow of gas from the container, said sealing and opening means being arranged so as to immediately follow said regulating means and forming with same a single unit fixed on the container at the gas exit; means adapted to be handled from outside said unit for adjusting said regulating means; and a burner arranged movably on top of said unit and controlling said opening and sealing means.

3. In a lighter using a compressed gas as fuel and having a closed container for the gas provided with an exit for the gas, in combination: means for regulating the rate of discharge of the gas arranged immediately above the exit of the container; a spring loaded valve for sealing and opening the flow of gas from the container, said sealing and opening valve being arranged so as to immediately follow said regulating means and forming with same a device including a single body fixed on the container at the gas exit; means adapted to be handled manually for adjusting said regulating means; and a burner arranged slidably on top of said body and controlling said opening and sealing valve.

4. In a lighter using a compressed gas as fuel and having a closed container for the gas provided with an exit for the gas, in combination: means for regulating the rate of discharge of the gas arranged immediately above the exit of the container; two spring loaded valves for sealing and opening the flow of gas from the container, said sealing and opening valves being arranged so as to immediately follow said regulating means and forming with same a device including a single body fixed on the container at the gas exit; means adapted to be handled from outside said body for adjusting said regulating means; and a burner arranged slidably on top of said body and controlling said opening and sealing valves.

5. In a lighter using a compressed gas as fuel and having a closed container for the gas provided with an exit for the gas, in combination: means for regulating the rate of discharge of the gas arranged immediately above the exit of the container; two spring loaded valves arranged in series for sealing and opening the flow of gas from the container, said sealing and opening valves being arranged so as to immediately follow said regulating means and forming with same a device including a single body fixed on the container at the gas exit; means adapted to be handled from outside said body for adjusting said regulating means; and a burner arranged slidably on top

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of said body and controlling said opening and sealing valves.

MARCEL QUERCIA.
GEORGES FERDINAND.

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