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PYROPHORIC GAS LIGHTERS

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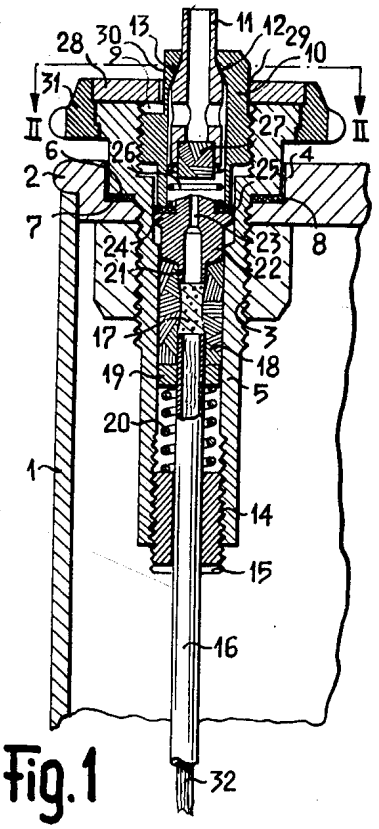

Fig.1

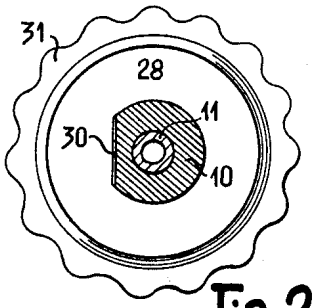

Fig.2

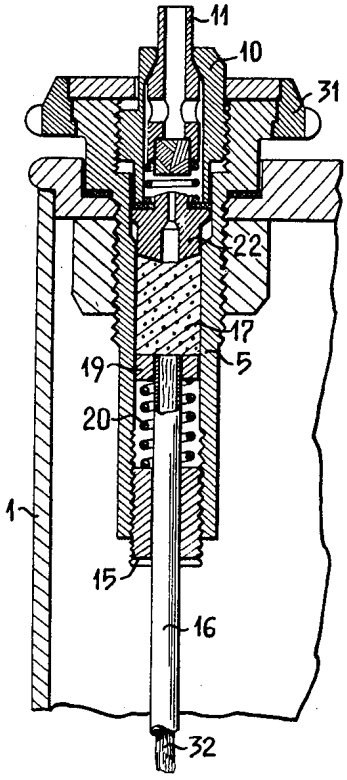

Fig.3

INVENTOR

CONRAD JEAN JACQUES ZELLWEGER

BY

ATTORNEY

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PYROPHORIC GAS LIGHTERS

Conrad Jean Jacques Zellweger, Geneva, Switzerland, assignor to La Nationale S. A., Geneva, Switzerland, a Swiss company

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Hitherto two solutions have been suggested for the supply of gas for the flame of a pyrophoric gas lighter. The first has consisted in filling the reservoir of the lighter with an absorbent material, such as cotton, which absorbs the fuel in liquid form and restores it to the gaseous form. It suffices to interpose, between the reservoir and the burner, a calibrated passage of variable cross-sectional area to allow of adjusting the delivery of gas, the said delivery varying in proportion to the internal pressure of the lighter, that is to say in proportion to the temperature.

The other method consisted in filling the reservoir with fuel in the form of liquid, supplying the liquid fuel to a more or less compressed small absorbent mass, such as cotton, asbestos, and so forth. The gasification of the liquid fuel then takes place either in the porous mass, or at its immediate surface. The adjustment of the delivery of gas may be effected by more or less compressing the porous material.

The various solutions which have been suggested hitherto for obtaining this variable compression, have the disadvantage of not allowing of a uniform compression of the porous material. Thus if the compression of a porous material such as cotton is effected by means of a screw in a cylindrical tube, the lateral friction of the porous mass against the walls of the tube, prevents it from being compressed in a uniform manner. The side against which the pressure is applied is compressed more, whilst the opposite portion, which bears against the bottom of the tube is compressed only very slightly.

However, during the passage of the gas or during shocks resulting from the use of the lighter, the variation of compression of the porous material tends to be equalised in the interior of the mass and thus the permeability of the porous mass to the gas changes, as also the size of the flame of the lighter.

The present invention has for its object to remedy the above mentioned disadvantages. It has for its subject a pyrophoric gas lighter of the type in which the fuel reaches the burner by passing through a porous material, a tightening device being provided for more or less compressing the porous material for the purpose of adjusting the delivery of fuel. The lighter according to the invention is characterised in that the said porous material is located in a guide tube and against a resilient support capable of yielding resiliently under the action of a tightening force transmitted to the porous material in such a manner as to obtain a sliding of the porous material in the guide tube at each adjustment determining an equalisation of the tensions in the said porous material.

Two forms of construction of a lighter according to the invention are shown diagrammatically and by way of example in the accompanying drawings, wherein:

Fig. 1 is a view in partial section of the first form of construction.

Fig. 2 is a section on the line II—II of Fig. 1.

Fig. 3 is a partial section of a second form of construction.

As shown in the drawing the lighter comprises a reservoir 1 forming the body of the lighter, closed by an upper plate 2. The latter is pierced by a screwed bore 3 of which the outer end is enlarged at 4. Into said bore 3 is screwed a tubular part 5 having a shoulder 6 adapted to abut with the bottom 7 of the enlarged part 4 of the bore 3, with the interposition of a fluidtight washer 8.

The outer portion of the tubular part 5 has an internally screwed recess 9 in which is secured a part 10 itself forming a tubular part.

The burner 11 has a conical part 12 which bears against a conical seat 13 provided in said part 10. The inner end of the tubular part 5 has a screw thread 14 into which is screwed a part 15 bored axially and in which is capable of sliding a tube 16 for the supply of fuel to the burner.

The porous material 17, through which the fuel passes, is located in a tube 18 of resilient material, for example artificial rubber. The tube 18 is located in the tubular part 5 which forms a guide tube for the porous material. A thrust washer 19 is secured to the tube 16 and is capable of sliding with this in the tubular part 5. Said washer 19 bears against one of the ends of a coiled spring 20, located around the tube 16, and of which the other end rests against the part 15. As shown in Fig. 1, the upper end of the tube 16 serves to guide the lower part of the resilient tube 18. The upper part of this is fitted around a tubular extension 21 of a part 22 which is bored axially by a passage 23. Said part 22, provided with a portion 24 of larger diameter, is capable of sliding axially in a portion of the tubular part 5 having a medium bore between that in which is located the resilient tube 18 and that in which the part 10 is secured.

The part 22 is adapted to be pushed against the tube 18 and the porous material 17 by the part 10 through the medium of a fluidtight lining 25.

On the other hand, the burner 11 is held against the conical seat 13 by a coiled spring 26 bearing at one end against the part 22, through the medium of the fluidtight lining 25, and at the other end, against the lower end of the tube forming the burner 11. It is to be observed that this lower end of the burner carries a plug 27 of resilient material adapted to close the passage 23 when closing the lighter by axial movement toward the bottom of the burner 11. To allow of setting the part 10 in rotation, a washer 28 is fitted around the part 10 and has an opening 29 of which the shape corresponds with the cross-section of the part 10 and is provided, on one of its sides, with a flat 30, said washer is clamped at its periphery in a crownpiece 31, capable of turning freely on the upper enlarged end of the tubular part 5.

For effecting the adjustment of the flame of the lighter, that is to say for adjusting the delivery of fuel reaching the burner, through the passage 16 containing a wick 32, by passing into the porous material 17, it suffices to rotate the crownpiece 31. In fact, when this is turned in such a manner as to cause a downward screwing of the part 10, the latter, by bearing against the part 22, also moves this downwardly whilst compressing the resilient tube 18 to a predetermined extent. Under the action of this compression, the tube 18 slides axially in the interior of its guide tube whilst moving, against the action of the spring 20, the washer 19 and the tube 16. The tube 18 is thus in a more compressed state than it was previously between the part 22 and the washer 19. As a result its inner wall swells and compresses the porous material 17.

By reason of the sliding of the tube 18 of resilient material in its guide tube 5 during each adjusting movement of the burner, said tube 18 does not stick to the interior of its guide tube and thus tensions, which are set up, on the one hand, in the material constituting the tube 18, and, on the other hand, in the porous material 17 itself, are distributed in a uniform manner over the entire

length of the tube **18** and throughout the entire mass of porous material **17**.

The adjustment is thus stable and the flame does not change in size once the adjustment has been completed.

The second form of construction of lighter shown in Fig. 2 is similar to the first and only differs therefrom by the fact that the porous material **17** of this second lighter is lodged directly in the guide tube **5**, without the interposition of a tube **18** of resilient material. For this reason the part **22** is not provided with the extension **21** and bears directly against the porous material **17**. The latter bears at its lower end against the washer **19**, secured to the tube **16** and which can move axially in the guide tube **5** against the action of the spring **20**. In this latter form of construction, the tension of the spring **20** may also be adjusted by screwing the part **15** more or less into the lower end of the guide tube **5**.

The whole of the adjusting device located above the part **22** is identical with the corresponding part of the lighter shown in Fig. 1.

The operation of this second form of construction is therefore similar to the first, that is to say that by setting the crownpiece **31** in rotation in the direction of screwing the part **10** downwards, an axial downward movement of the part **22** is produced, thus effecting a sliding of the whole of the porous mass **17**, as also of the washer **19** and the tube **16**, in the guide tube **5** against the action of the spring **20**. As a result there is a more forcible compression of the porous mass **17**, producing a reduction of the passage of gas therethrough, therefore also at the outlet of the burner.

This second form of construction has the same advantages as the first, that is to say, by reason of the sliding of the whole of the porous mass **17** in its guide tube **5** during operation of regulating the burner, the tensions arising in said porous mass **17** tend to be equalised already during the adjusting operation, so that the flame of the burner remains stable once the adjustment has been completed.

It is to be observed that, as the guide tube **5** is screwed into the upper part of the reservoir, the mounting and removal of the burner can be effected easily and rapidly so that the tension of the spring **20** may be selected and adjusted at a different value, even after complete assembly of the lighter, simply by unscrewing the tubular part **5** which carries the whole of the adjusting device of the burner.

Both in the first and in the second form of construction, the wick **32** may be formed either of cotton or by means of fibres of artificial material, such as the material known as nylon.

The porous material **17** may be formed by asbestos or even by cotton or nylon.

It is to be observed that particularly interesting results may be obtained, especially in the first form of construction, by using a wick of nylon for forming the wick **32** and the porous material **17**, said wick of nylon extending into the interior of the part **22** for facilitating the evaporation of liquefied gas.

I claim:

1. A pyrophoric gas lighter, comprising a burner to which gas is supplied through a porous material, a tube housing said porous material, and means for uniformly compressing said material longitudinally throughout its cross-sectional area to a uniform density to regulate the flow of gas to the burner, said means including a manually controlled slidable part located medially in the tube and having a bore establishing communication between the tube and the burner and providing at its inner end a wall with which one end of said porous material is engaged, an adjustable abutment at the inner end of the tube, a washer slidable in the tube for engaging the other end of said material, and a spring confined between said abutment and the washer to continuously maintain a compressive effect on the body of the porous material throughout its cross-sectional area.

2. A pyrophoric lighter, according to claim 1, wherein, the adjustable abutment at the inner end of the guide tube is provided with a bore and a fuel supply tube is slidable in the bore, said fuel supply tube carrying said washer.

3. A pyrophoric gas lighter including a burner which receives fuel passed through a porous material, a device for more or less compressing said porous material for the purpose of adjusting the delivery of fuel to said burner, said device including, a guide tube, a washer slidable in said tube for engaging said porous material, an adjustable spring having one end thereof acting on said washer, the other end thereof bearing against a part screwed into the guide tube in such a manner as to allow, after assembly of the lighter, adjustment of the tension of said spring independently of external adjustment by said device to produce a sliding movement of the porous material and of the washer in said guide tube at each adjustment of the spring which causes an equalization of the tensions in said porous material.

4. A pyrophoric gas lighter including a burner for receiving fuel which has passed through porous material, a tightening device for more or less compressing said porous material for the purpose of adjusting the delivery of fuel to the burner, a guide tube, a resilient support slidable in the guide tube, a tube of resilient material within said guide tube and containing said porous material, said tightening device acting on said porous material through the medium of said resilient tube, the end of said resilient tube resting against said resilient support to obtain simultaneous sliding of said resilient tube and said porous material in said guide tube on each adjustment thereby determining an equalization of the tensions in said resilient tube and in the porous material.

5. A pyrophoric gas lighter including a burner which receives fuel which has passed through a porous material contained in a tube of resilient material, a tightening device being provided to act on said porous material through the medium of said resilient tube for more or less compressing said porous material for the purpose of adjusting the delivery of fuel, said resilient tube being located in a guide tube, the end of said resilient tube resting against a washer capable of sliding in the guide tube a spring under the action of a tightening force transmitting to the resilient tube and to the porous material so as to produce simultaneous sliding of said resilient tube and said porous material in said guide tube on each adjustment thereby determining an equalization of the tensions in the said resilient tube and in the porous material.

6. A lighter according to claim 5, wherein said last mentioned spring has one end acting on said washer, the other end of said spring bearing against a part screwed into the guide tube in such a manner as to permit of adjusting the tension of said spring independently of external adjustment by the tightening device after assembly of the lighter.

7. A pyrophoric gas lighter including a burner which receives fuel which has passed through a porous material, a tightening device being provided for more or less compressing said porous material for the purpose of adjusting the delivery of fuel, said porous material being located in a guide tube and against a washer capable of sliding in the guide tube a spring transmitting through the washer a tightening force to the porous material so as to produce a sliding movement of the porous material and of the washer in said guide tube at each adjustment which determines an equalisation of the tensions in said porous material, said spring having one end thereof acting on said washer, the other end of said spring bearing against a part screwed into the guide tube in such a manner as to allow, after assembly of the lighter, adjustment of the tension of said spring independently of external adjustment by said tightening device, the guide tube being screwed into the body of the lighter with the interposition of a fluidtight lining in such a manner as to permit

of rapid assembly and dismantling of the lighter for obtaining access to the internal device for adjusting the tension of the spring.

8. A pyrophoric gas lighter including a burner which receives fuel which has passed through a porous material contained in a tube of resilient material, a tightening device being provided to act on said porous material through the medium of said resilient tube for more or less compressing said porous material for the purpose of adjusting the delivery of fuel, said resilient tube being located in a guide tube, the end of said resilient tube resting against a washer capable of sliding in the guide tube against the action of a spring under the action of a tightening force transmitted to the resilient tube and to the porous material so as to produce simultaneous sliding of said resilient tube and said porous material in said guide tube on each adjustment thereby determining an equalisation of the tensions in the said resilient tube and in the porous material, said last mentioned spring having

one end acting on said washer, the other end of said spring bearing against a part screwed into the guide tube in such a manner as to permit of adjusting the tension of said spring independently of external adjustment by the tightening device after assembly of the lighter, the guide tube being screwed into the body of the lighter with the interposition of a fluidtight lining so as to permit of rapid assembly and dismantling of the burner, so as to give access to the internal device for adjusting the tension of the spring.

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