May 1, 1956 S. H. NEWMAN 2,743,597

COMPRESSED GAS-FUELLED CIGARETTE LIGHTERS

Filed Aug. 31, 1953 4 Sheets-Sheet 1

FIG. 1.

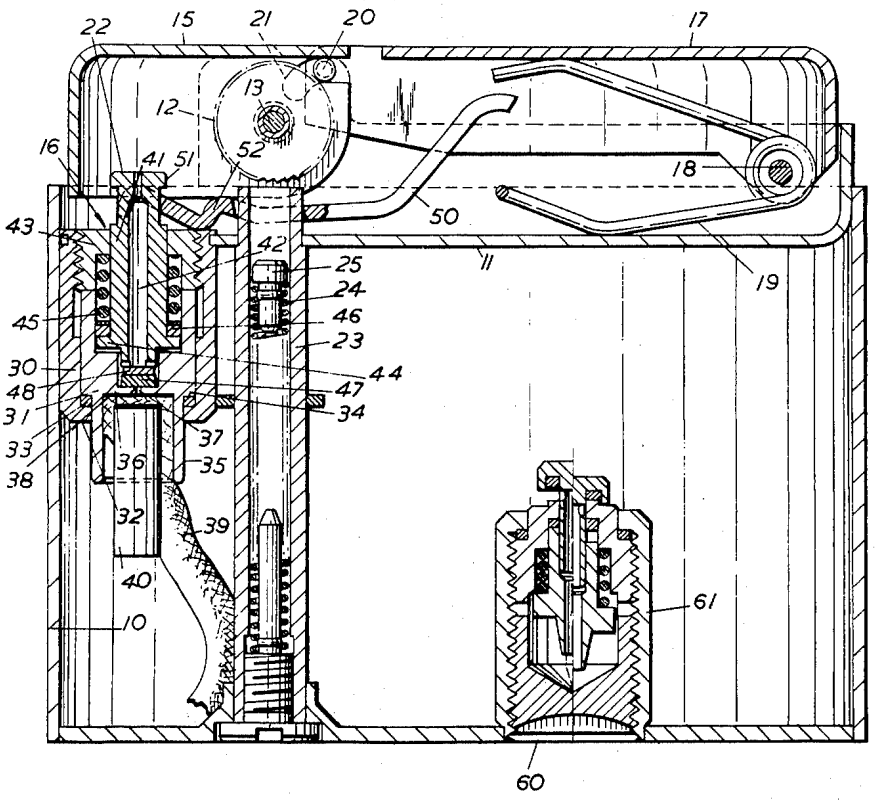

FIG 2.

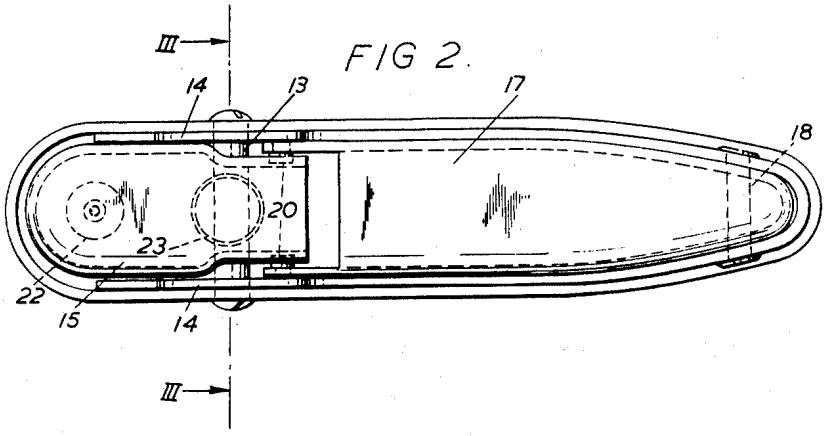

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FIG. 3.

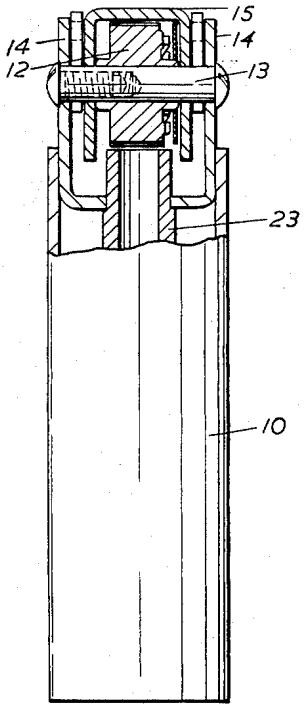


FIG. 4.

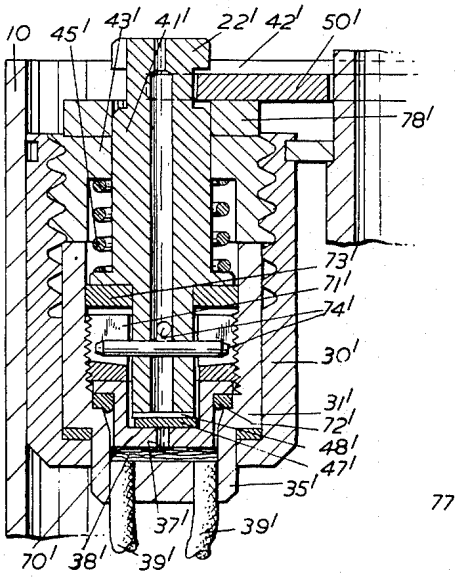
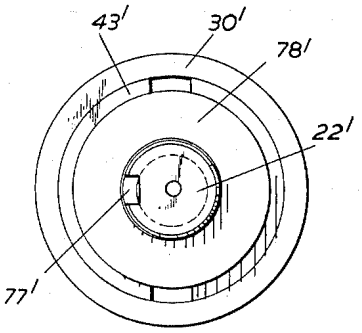


FIG. 6.



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COMPRESSED GAS-FUELLED CIGARETTE LIGHTERS

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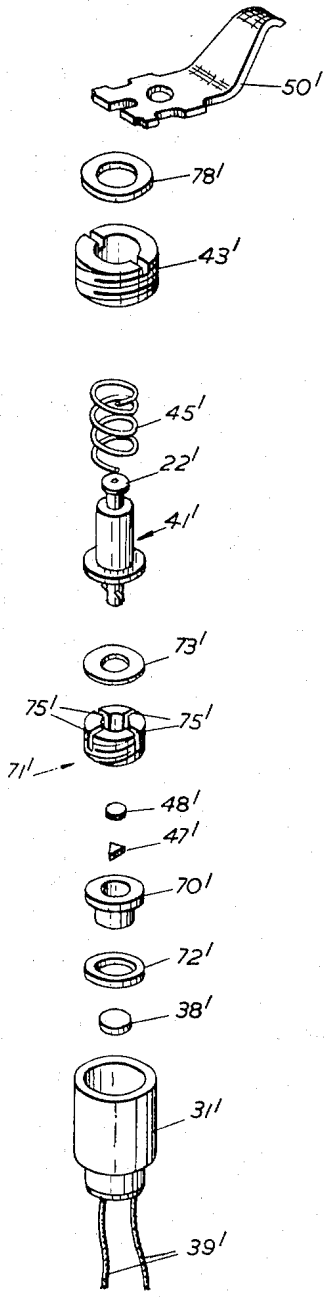

FIG. 5.

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FIG. 7.

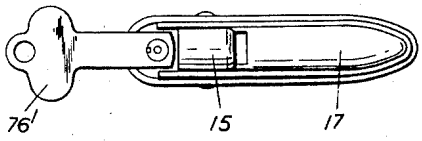


FIG. 8.

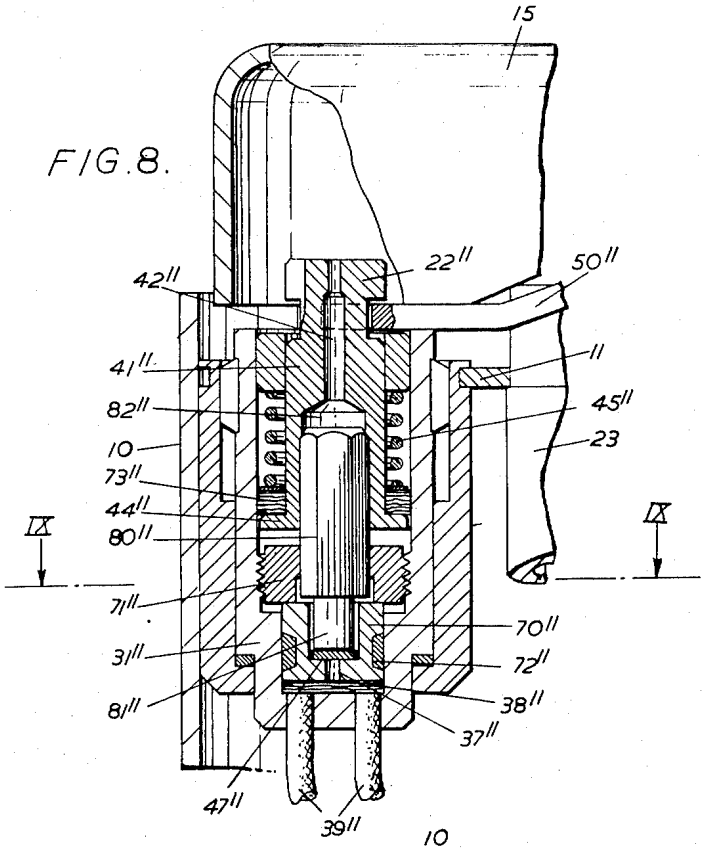
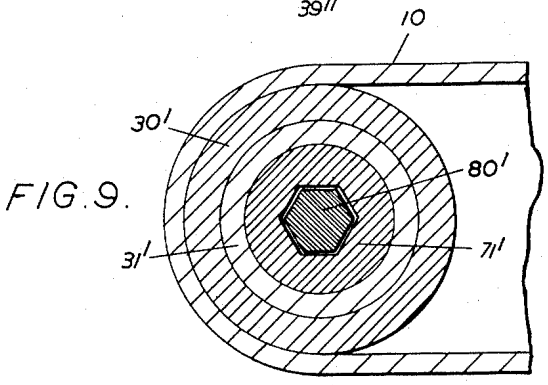


FIG. 9.



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United States Patent Office

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COMPRESSED GAS-FUELLED CIGARETTE LIGHTERS

Stanley Herbert Newman, New York, N. Y.

Application August 31, 1953, Serial No. 377,569

Claims priority, application Great Britain September 1, 1952

7 Claims. (Cl. 67—7.1)

This invention relates to cigarette, pipe or cigar lighters for smokers, of the type which employs as fuel a compressed gas such as butane.

In one aspect of the present invention a lighter of the type specified comprises a container for storing a supply of fuel under pressure in the liquid state, a narrow gas passage leading from the container to a burner jet where the gas is to be burnt and a stop valve adapted to open and close communication between the gas passage and the burner jet, and the mouth of the gas passage on the side facing the interior of the fuel container is covered and closed by a thin diaphragm of absorbent material such as paper, in contact with which is a wick of absorbent material adapted to conduct liquefied fuel from the interior of the container to the diaphragm which will absorb it, so that when the stop valve is opened liquefied fuel thus supplied to and absorbed in the diaphragm will evaporate and produce a stream of gas passing through the gas passage to the burner jet.

In one arrangement the wick is held in contact with the absorbent diaphragm by means of a retaining peg forced longitudinally into the open end of a tubular surrounding member at the far end of the interior of which the absorbent diaphragm lies, the wick passing over the end of the peg so as to be pressed thereby into contact with substantially the whole of the inner face of the absorbent diaphragm.

Thus for example the tubular surrounding member is provided with a cylindrical bore, while the peg is also generally cylindrical and fits the bore, opposite flanks of the peg being relieved to provide segmental passages for the wick between the relieved surfaces of the peg and the walls of the bore.

Another aspect of the present invention is concerned with providing means for regulating the height of the flame. This aspect of the invention comprises, in its broadest form, a lighter of the type fuelled by a compressed gas, in which liquefied fuel from the container is supplied to a pad of porous material part of which covers a narrow gas passage through which gas evaporates from the pad and flows to a burner, and in which means adjustable from outside the lighter is provided for applying a variable compression to the pad to regulate the rate of evaporation of gas through the gas passage and thus to regulate the height of the flame.

This aspect of the invention is particularly though not exclusively applicable to a lighter such as is referred to above in which there is provided a diaphragm of absorbent material such as absorbent paper in contact with which is a wick of absorbent material adapted to conduct liquefied fuel by capillary action from the interior of the container to the diaphragm which will absorb it.

Thus in one convenient construction the diaphragm is held in compression between two opposed surfaces one of which contains the mouth of the gas passage, and means adjustable from outside the lighter is provided for varying the compression applied thereby to the diaphragm so as to regulate the rate of evaporation and escape of gas from it through the gas passage, the diaphragm being considerably larger than the mouth of the gas passage and the point or points at which the diaphragm is supplied with liquid fuel by the wick being offset from the mouth of the gas passage.

According to yet another aspect of the present invention, in a lighter of the type fuelled by compressed gas and including a hollow plunger incorporating a gas burner and movable axially from a closed position in which the supply of gaseous fuel to the burner is prevented, to an open position in which gas flows to the burner, means is provided whereby rotation of the plunger about its axis of linear movement varies the setting of an adjustable flow valve which controls the rate of flow of gas to the burner.

For instance, in the case of a lighter such as is referred to above in which a diaphragm of absorbent material such as absorbent paper is held in compression between opposed surfaces and means adjustable from outside the lighter is provided for varying the compression of the diaphragm, rotation of the said plunger about its axis may be employed to cause the regulation of the compression of the diaphragm and thus the regulation of the height of the flame.

In one such construction the movable plunger carries a radially extending member which engages in a slot formed in a surrounding adjustable screwthread collar retained in the surrounding body of the valve by a screwthread coaxial with the plunger, so that the plunger is free to move axially but rotation about its axis causes the rotation of the screwed member which in turn varies the compression of the diaphragm. The head of the plunger may be formed for engagement by a suitable key for rotating it to regulate the setting of the adjustable member in accordance with the desired height of the flame.

In an alternative construction a part of the inner end of the movable plunger is of uniform non-circular, for example hexagonal, cross-section, and fits loosely in an axial bore of correspondingly shaped but slightly larger cross-section formed in the adjustable screwthreaded collar. Thus the plunger is free to move axially to operate the said valve but its rotation will cause the rotation of the adjustable screwthreaded collar to vary the compression of the diaphragm.

The invention may be carried into practice in various ways, but certain specific embodiments will now be described with reference to the accompanying drawings in which

Figure 1 is a sectional side elevation of a pocket cigarette lighter employing compressed gas fuel such as butane,

Figure 2 is a plan of the lighter of Figure 1,

Figure 3 is an end elevation of the lighter of Figure 1, partly in section on the line III—III of Figure 2,

Figure 4 is a sectional view on an enlarged scale showing an alternative construction of gas flow valve incorporating flow regulating means, for use in the lighter of Figure 1,

Figure 5 is an exploded view showing the elements of the gas flow valve and burner illustrated in Figure 4,

Figure 6 is a plan of the top of the gas flow valve and burner of Figure 4,

Figure 7 is a plan showing the method of adjusting the gas flow valve of Figures 4 to 6 using a special key,

Figure 8 is a sectional view on an enlarged scale of a modified construction of gas flow valve, and

Figure 9 is a cross-section on the line IX—IX of Figure 8.

In the embodiment shown in Figures 1 to 3 a gas-fuelled cigarette lighter includes a fuel container **10** adapted to be filled with a combustible compressed gas fuel such as butane gas, maintained in the liquid phase

under a pressure considerably greater than atmospheric, for example up to about 35 pounds per square inch. On the top wall **11** of the fuel container is mounted a serrated striker wheel **12** of the usual type pivoted on a shaft **13** extending between a pair of parallel flanges **14** projecting upwardly from the fuel container **10**. Also pivoted on the shaft **13** is a snuffer arm **15** extending to one end of the container **10** over a combined stop valve and burner which is generally indicated at **16** in Figure 1 and which communicates with the interior of the container **10**.

A movable fingerpiece or operating member **17** of channel section is pivoted at one end on a shaft **18** mounted on the top wall **11** of the container **10** at the end opposite the valve and burner **16**. The fingerpiece **17** is spring-biassed in an upward direction by a small torsion spring **19** which surrounds the shaft **18** and acts between it and the top wall **11** of the container. At its inner end, remote from the shaft **18**, the fingerpiece **17** carries projecting studs **20** which engage in slots **21** formed in the tail of the snuffer arm **15**, so that when the fingerpiece **17** is pressed downwards by the operator, it will move towards the top wall **11** of the fuel container and will rotate the snuffer arm **15** upwardly so as to expose the head of the burner **22** associated with the valve **16**; at the same time this rotation of the snuffer arm will also rotate the striker wheel **12** in the usual manner and in addition, as described below, will open the stop valve **16** to supply gas to the burner head **22** of the valve. A hollow flint tube **23** extends between the upper and lower walls of the fuel container **10** and a compression spring **24** within the flint tube bears on a flint carried by the plunger **25** so that the flint is pressed against the serrated rim of the striker wheel **12** in the usual manner. Thus when the striker wheel is rotated by depressing the fingerpiece, as described above, a stream of sparks is struck by it from the flint and is ejected from it towards the burner **22**, at the same time as the snuffer arm **15** is raised to expose the burner.

When the pressure on the fingerpiece **17** is removed, it will be returned to its idle position, generally parallel to the top wall **11** of the fuel container **10**, and in so doing it will swing the snuffer arm **15** down again over the burner **22**. In their idle or closed positions, the fingerpiece **17** and snuffer arm **15** co-operate to form a smooth continuous upper casing to the top of the fuel container covering the working parts.

The combined stop valve and burner **16** is mounted in a small cylindrical well or recess **30** let into the top wall **11** of the fuel container. It comprises a hollow metal plug **31** which fits closely into the wall **30** and rests on a flange **32** at the bottom thereof, a sealing washer **33** of resilient material being placed between the flange and a co-operating shoulder **34** on the plug **31**. The plug **31** is formed with a cylindrical skirt **35** which projects downwardly through a hole in the bottom of the well into the fuel container itself, and the bore of the plug is interrupted by a constriction in the form of a metal wall **36** which extends transversely across the bore just above the skirt **35** and inside it, and which is formed with a small perforation comprising a very fine escape vent or passage **37** through which gas from the fuel container can pass upwards to the burner. To restrict the flow of gas through the escape vent **37** the latter is covered by a thin disc of absorbent paper **38** which lies over it inside the skirt **35**. A wick **39** of suitable absorbent material leads from the interior of the fuel container into the skirt **35** and is pressed into close contact with the paper disc **38** by means of a retaining peg **40** whose uniform cross-section is cylindrical with segments cut off opposite flanks by parallel chords. The peg **40** fits closely into the interior of the skirt of the plug and is forced axially into the interior of the skirt with the wick **39** passing up the space provided by one missing segment, over the end of the peg **40** in contact with the paper disc

38, and down into the space provided by the other missing segment.

Apart from the wick **39** the fuel container **10** is not filled with any other absorbent material and the compressed fuel is carried freely in it in liquid form. The purpose of the wick **39** is to conduct liquid fuel by capillary action up to the top of the interior of the skirt **35** so as to wet the paper disc **38**. Gas evaporating from the paper disc **38**, through which the liquid fuel filters, can then pass up the escape vent **37** to the burner **22** when a stop valve which normally seals the other end of the escape vent **37** is raised.

The stop valve comprises a hollow plunger **41** of circular section which can be moved axially from a closed position in which it seals the gas passage **37** to a higher open position in which it permits gas to escape from the gas passage **37** into the interior bore **42** of the plunger. At the upper end of the plunger is the burner head **22** formed with a fine burner jet through which gas from the bore **42** will pass to the outside to be lit by sparks from the striker wheel **12**.

The plunger **41** is supported at its other end by a surrounding collar **43** which is screwed into the top of the well **30**, this well being formed with an internal screwthread for this purpose. When the collar **43** is screwed fully home it also engages the top of the plug **31** and holds this firmly in place in the bottom of the well **30**. Near its lower end the plunger is formed with a projecting circumferential flange **44** which fits the upper part of the bore of the plug **31**. A compression spring **45** acts between the flange **44** of the plunger and the screwed collar **43** so as to bias the plunger **41** in a downward direction towards the bottom of the well. An annular sealing washer **46** is interposed between the spring **45** and the flange **44** of the plunger. This washer **46** is of resilient material so that the pressure of the spring **45** will tend to cause it to expand radially outwards into contact with the bore of the plug **31**, thus preventing the escape of gas past the outside of the plunger **41**.

Overlying the escape vent **37** is a small disc **47** of synthetic rubber or like resilient material, of smaller diameter than that of the bore of the plug **31** at that point, and this resilient disc **47** acts as a sealing member to seal the escape vent **37** when pressed downwards on to it by the bottom of the plunger **41** under the action of the spring **45**. A small metal disc **48** overlies the resilient disc **47** and acts as a distance piece between it and the open end of the plunger **41**. The latter is formed with a pair of notches in the rim of its wall to ensure that its bore **42** shall always be in communication with the surrounding space in the bore of the plug **31**, despite the proximity of the brass distance piece **48** underlying it. Thus when the plunger **41** is in its lower or closed position it will be pressed downwards by its spring **45** on to the distance piece **48** and resilient sealing disc **47**, to keep the latter firmly pressed over the escape vent **37** and so to prevent the escape of any gas. When the plunger **41** is raised, however, the spring pressure on the resilient sealing disc **47** is removed and the latter will be lifted off the escape vent **37** by the pressure of the gas within, which will then pass from the vent **37** around the disc **47** and distance piece **48** into the bore **42** of the plunger **41**, via the notches in its lower edge, and so up to the burner **22** where it will escape and burn.

Means is provided for automatically raising the plunger **41** from its closed position when the fingerpiece **17** is depressed. This comprises a rocking lever **50** formed of a length of steel strip and shaped at one end as a fork which engages a neck **51** formed under the burner head **22** which projects above the top wall **11** of the fuel container. The lever **50** is bent to provide a downwardly projecting transverse kink or ridge **52** close to its forked end, and in use the ridge **52** bears on the top of the wall **11** of the fuel container and acts as a fulcrum for the lever. The main part of the lever **50** extends along the

top of the fuel container away from the fulcrum **52** underneath the snuffer arm **15**, the striker wheel **12**, and the fingerpiece **17**, the lever being formed with an aperture through which the head of the flint tube **23** passes. The end of the lever **50** remote from the burner **22** is swept upwardly to the vicinity of the web of the fingerpiece **17**, so that when the latter is depressed to raise the snuffer arm and operate the flint wheel it will also engage and depress that end of the lever **50** which will rock about its fulcrum. The forked end of the lever will thus be raised and will lift the plunger **41** from its closed position to permit the escape of gas through the burner **22**.

Thus the single operation of depressing the fingerpiece **17** will raise the snuffer arm **15** to expose the burner **22**, will raise the plunger **41** to open the stop valve and supply gas to the burner jet, and will operate the striker wheel **12** to ignite the gas emerging from the burner jet. When the fingerpiece is released the lever **50** will rock back to permit the closing of the stop valve under the action of the plunger spring **45**, thus shutting off the supply of gas, and the snuffer arm will be closed over the burner.

The fuel container is provided with a suitable charging aperture **60** for refilling it with compressed fuel. This incorporates a charging valve **61** adapted to co-operate with a separate refill cartridge containing fuel under pressure.

In the modified construction illustrated in Figures 4, 5 and 6, the general arrangement of the cigarette lighter is similar to that illustrated in Figures 1 to 3. In the modified construction however, the lighter is provided with a different arrangement of burner stop valve which incorporates an adjustment for regulating the height of the flame.

In this modification the combined burner and stop valve is mounted as before in a small cylindrical well or recess **30** let into the fuel container **10** and comprises a hollow metal body or plug **31'** which fits into the well **30'** and is provided with a closed lower extension **35'** of reduced diameter which projects through a hole in the bottom of the well into the interior of the fuel container **10**. The hollow plug **31'** is held in the well by an externally screwthreaded top nut **43'** which engages an internal screwthread formed in the well.

The bottom wall of the lower extension **35'** of the plug **31'** is perforated by a number of holes spaced around its outer edge and leading into the interior of the plug, and into each of these holes is forced the head of a wick **39'** which extends downwards from the top into the liquefied fuel contained under pressure in the fuel container **10**. A disc of absorbent paper **38'** is located inside the plug on top of its bottom wall and overlies the perforations in contact with the heads of the wicks **39'**, so that liquid fuel drawn up the wicks by capillary action will be supplied to the paper disc and will be absorbed by it. The paper disc **38'** is engaged and covered by the bottom of a cup member **70'** which lies inside the plug **31'** and is forced downwards to compress the paper disc **38'** by means of a threaded collar **71'** whose external screwthread engages a corresponding internal screwthread formed on the wall of the plug **31'**. A fine gas escape vent or passage **37'** is formed in the bottom of the cup **70'** overlying the centre of the paper disc **38'** and liquefied gas absorbed by the paper disc will then evaporate from it and escape through the passage **37'** at a rate determined by the pressure exerted by the cup **70'** on the paper disc, when a stop valve sealing member **47'** overlying the top of the passage **37'** is raised. The cup **70'** is provided with an external top flange by means of which a resilient sealing washer **72'** is pressed against a cooperating shoulder on the wall of the plug **31'** so as to prevent the escape of compressed fuel in liquid or gaseous form past the outside of the cup **70'** and yet to allow the cup to be pressed resiliently against the paper disc **38'** by means of the threaded collar **71'**.

A hollow plunger **41'** of circular section is provided to operate the stop valve, and is movable from a closed position in which it bears on the sealing member **47'** to seal the gas escape vent **37'**, to a higher open position in which it releases the stop valve sealing member **47'** to permit gas to escape into the bore **42'** of the plunger. At its other end the plunger is formed with a burner head **22'** incorporating a fine burner jet which communicates with the bore **42'**. The sealing member **47'** comprises a triangular pad of resilient material such as synthetic rubber, which overlies the top of the escape vent **37'** but is lifted by the gas pressure to allow the escape of gas when the plunger **41'** is raised. A small metal disc **48'** is interposed between the sealing pad **47'** and the open bottom of the plunger **41'** to act as a distance piece.

The plunger **41'** is axially movable in a hole defined by an inwardly directed flange at the top of the top nut **43'** which retains the plug **31'**, and is spring-biassed to its inner or closed position by a compression spring **45'**. A diaphragm washer **73'** encloses the plunger **41'** below its flange and engages the wall of the plug **31'** to prevent the escape of fuel past the outside of the plunger. The lower end of the plunger is of reduced diameter and extends down through the bore of the threaded collar **71'** into the interior of the cup **70'**, where it presses the steel disc **48'** and the sealing pad **47'** against the top of the escape vent **37'**.

In order to rotate the threaded collar **71'** and so to vary the pressure of the cup **70'** on the paper disc **38'**, the plunger **41'** is provided with transverse driving pins **74'** which project from the surface of the plunger at right angles to its axis and to one another, the pins **74'** engaging in deep slots **75'** formed in the upper surface of the threaded collar **71'** as shown in Figure 5. These slots permit the plunger to move axially up and down to open and close the supply valve. When the plunger is rotated about its axis, however, the driving pins **74'** will engage the walls of the slots **75'** and cause the rotation of the collar **71'**, and so screw it down or up thus increasing or decreasing the pressure of the cup **70'** on the paper disc, and so regulating the rate at which gas will evaporate from the disc through the escape vent when the stop valve is opened. A special key **76'** (Figure 7) is provided to fit the burner head **22'** of the plunger for rotating it to adjust the setting of the collar **71'**, the key **76'** having an aperture formed with a spline to fit the head **22'** of the plunger which has a corresponding groove **77'**.

The plunger **41'** is provided with a neck of reduced diameter just below its head **22'** for engagement by the forked end of the rocking lever **50'** which is operated by depressing the fingerpiece **17** of the lighter. In this case, however, the end of the lever **50'** which carries the plug is flat, and it rocks on the edge of a fulcrum ring **78'** which surrounds the head of the plunger on top of the valve body.

A further modification of the combined stop valve and burner is illustrated in Figures 8 and 9. In this case the general arrangement of the paper disc **38''** supplied with fuel by wicks **39''** and of the cup **70''** which overlies the paper disc and has a perforation **37''** in its lower wall, is much the same as in the previous embodiment illustrated in Figure 4. In this case the cup **70''** has a circumferential groove which retains a sealing washer **72''** against the inner wall of the plug **31''**.

As in the previous embodiment a screwthreaded collar or nut **71''** overlies the cup **70''** and is screwed up or down to vary the pressure of the cup on the paper disc **38''** and so to vary the height of the flames. In this case, however, instead of being formed with deep slots the collar **71''** is formed with a bore of hexagonal section through which passes freely a solid hexagonal plug member **80''** forming the lower part of the plunger **41''**. The hexagonal plug member **80''** just fits within the bore of the collar **71''** so that it can move axially up and down quite freely relatively to the collar, but when rotated about its axis causes

the rotation of the collar 71". A solid cylindrical extension 81" on the lower part of the hexagonal plug 80" enters the interior of the cup 70" to engage the resilient sealing member 47" overlying the gas passage 37".

The plunger 41" is formed with a cylindrical bore 82" into which the upper part of the hexagonal plug 80" is a force fit, so that passages remain between the surface of the bore 82" and the flats of the hexagonal plug 80" permitting the flow of gas into the upper bore 42" of the plunger and so to the burner 22". In this case the diaphragm washer 73" overlies a flange 44" at the bottom of the plunger 41" and is pressed against it by the compression spring 45".

Thus when the fingerpiece 17 is depressed the rocking lever 50" raises the plunger 41" together with the hexagonal plug 80" which moves longitudinally in the nut 71", and its lower end 81" releases the sealing member 47", to allow the escape of gas upwardly between the hexagonal plug 80" and the hexagonal bore of the collar 71', and thence between the hexagonal plug and the cylindrical bore 82" of the upper part of the plunger to the burner 22".

When the burner 22" is engaged by a key and the plunger is rotated thereby about its axis together with the hexagonal plug 80", the plug 80" engages the hexagonal bore of the collar 71" to rotate the latter also, and thus screws it up or down to decrease or increase the pressure of the cup 70" on the paper disc 38" and so to vary the height of the flame.

Furthermore, the burner head 22" may be raised to compress the spring 45" and to lift the whole plunger up until the hexagonal plug 80" comes clear of the hexagonal bore in the collar 71", and the whole plunger can then be rotated through any desired multiple of 60° and then dropped back so that the hexagonal plug re-enters the hexagonal bore; in this way the slot 77" in the burner head 22" which is used for engagement with the key can be brought to the most convenient orientation so that the key when in use will not foul the snuffer arm or its supports or other fittings on the top of the lighter body.

When the valve is in the closed position, the hexagonal shoulder on the plug 80" overlying the reduced cylinder portion 81" bears on the top of the cup 70" so as to limit the inward movement of the plunger. The length of the cylindrical portion 81" and the depth of the interior of the cup 70" are so dimensioned as to limit the compression of the resilient sealing member 47" to a safe value, thus enabling a more powerful spring 45" to be used to return the plunger without any danger of the compression of the sealing member 47" by the spring exceeding the elastic limit and destroying the member 47".

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

1. A cigarette lighter of the type which employs as fuel a compressed inflammable gas, which comprises a pressure container adapted to hold a supply of the compressed fuel in the liquid state, and a combined valve and burner assembly supported by a wall of the container, the said assembly including a cup-shaped hollow supporting member, a plug disposed in the interior of the supporting member, a disc-shaped absorbent pad held in compression in the interior of the supporting member below the plug, an externally screwthreaded driving nut screwed into a cooperating internal screwthread formed in the supporting member, the driving nut overlying the plug and pressing it downwardly to compress the absorbent pad, the degree of compression of the pad being adjustable by screwing the driving nut up and down, a wick supported at its outer end by the cup-shaped supporting member in contact with at least the periphery of the inner surface of the absorbent pad, the wick extending through the wall of the cup-shaped supporting member into the interior of the container, and the plug being formed with a transverse gas passage whose inner end is covered by the central region of the outer surface of the absorbent pad, a resilient valve member overlying the outer end of the gas passage, an axially movable hollow plunger extending within the cup-shaped supporting member and inwardly spring biased, the inner end of the plunger extending through an aperture in the driving nut and bearing on the resilient valve member to hold it in sealing engagement with the outer end of the gas passage and thus to prevent the escape of gas through the passage, mechanism for moving the plunger axially outwards to release the resilient valve member and permit the escape of gas from the passage, the plunger being formed at its outer end with a burner jet communicating with its bore to which the gas escaping from the gas passage passes when the resilient valve member is released, and the plunger being rotatable about its longitudinal axis which is coaxial with the screwthread axis of the driving nut, and including a sliding connection between the plunger and the driving nut which permits the axial movement of the plunger relatively to the driving nut, but which prevents relative rotation between the plunger and the driving nut, whereby rotation of the plunger rotates the driving nut and so varies the compression of the absorbent pad to provide regulation of the size of the lighter flame at the burner jet.

2. A lighter as claimed in claim 1 in which the head of the plunger is formed for engagement by a suitable key outside the lighter, for rotating the plunger to effect the regulation of the flame size.

3. A lighter as claimed in claim 1 in which the plunger carries a radially extending arm which engages in a slot formed in the driving nut, the slot extending parallel to the axis of the plunger, the arm and the slot together constituting the sliding connection between the plunger and the driving nut.

4. A lighter as claimed in claim 1 in which the inner end of the plunger is of uniform non-circular cross-section and in which the aperture of the driving nut is of corresponding but slightly larger shape, the inner end of the plunger fitting closely within the aperture of the nut to provide the sliding connection between the plunger and the driving nut.

5. A lighter as claimed in claim 4 in which the cross-section of the inner end of the plunger is hexagonal, and in which the shape of the aperture in the driving nut is also hexagonal.

6. A lighter as claimed in claim 5 in which the plunger is formed in two parts, namely an outer hollow tubular portion having a cylindrical bore and formed with the burner jet in its outer end, and an inner solid plug having a uniform hexagonal cross-section along the majority of its length, the hexagonal part of the solid plug being a force fit in the cylindrical bore of the outer tubular part.

7. A lighter as claimed in claim 6 in which the solid plug is formed at its inner end with a shoulder which engages the plug to limit the degree of compression of the resilient valve member by the plunger under the action of the spring-biasing means.

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