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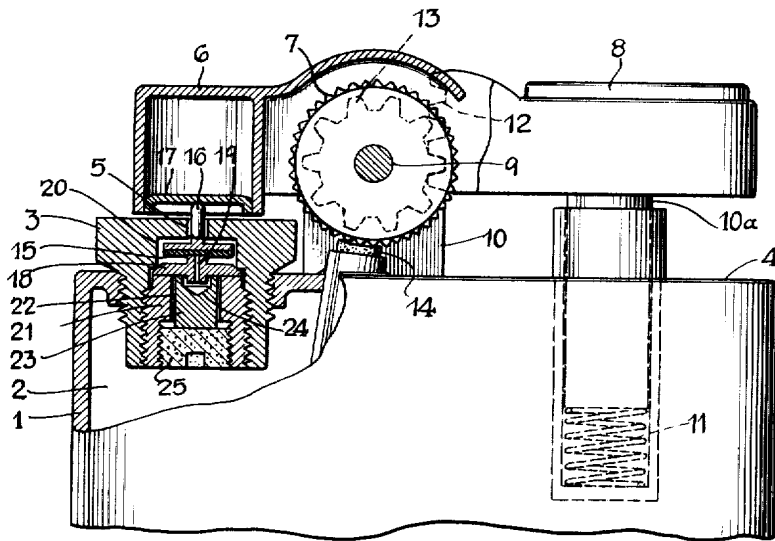
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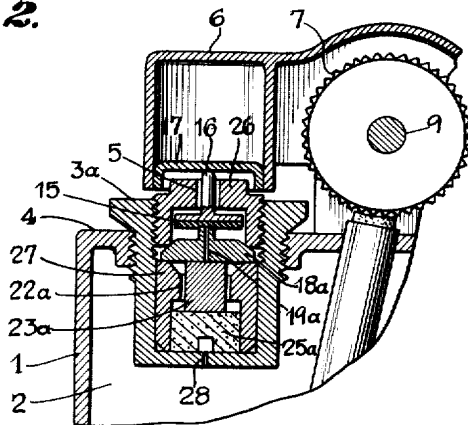
GAS LIGHTER

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*Fig. 1.*



*Fig. 2.*



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## GAS LIGHTER

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6 Claims. (Cl. 67-7.1)

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The invention relates to cigar lighters fueled by combustible gases such as butane or propane, and in one of its aspects relates more particularly to lighters of the above character wherein a cap overlies the burner of the lighter when idle, and is moved to burner exposing position by actuation of a fingerpiece when a light is desired, and the cap being coordinated with a valve controlling the flow of fuel to the burner in such manner that the cap automatically engages the valve to cut off the flow of fuel through the burner, when the cap moves from burner exposing position to burner covering position, and releases the valve to afford flow of fuel through the burner as the cap moves from burner covering to burner exposing position. In another aspect the invention relates to a lighter of the above character wherein the flow of fuel through the burner is automatically regulated upon rise and fall in the temperature of the gas, to provide a substantially constant height of flame at the burner, throughout the range in temperature to which the lighter is likely to be subjected in normal use. Further objects and advantages of the invention will be in part obvious and in part specifically referred to in the description hereinafter contained which, taken in conjunction with the accompanying drawings, discloses certain preferred forms of lighters constructed to operate in accordance with the invention; the disclosure however should be considered as merely illustrative of the principles of the invention, in its broader aspects. In the drawings—

Fig. 1 is a side view, with certain parts appearing in section, of a lighter constructed to operate in accordance with the invention.

Fig. 2 is a view similar to the upper left hand portion of Fig. 1, but showing a somewhat modified form of construction.

Referring first to Fig. 1, the invention is illustrated as applied to a lighter having a casing 1, having a chamber 2 constructed to hold under pressure, a supply of gaseous fuel such as butane or propane. For present purposes it is immaterial whether the chamber 2 be understood as provided directly within the casing 1, or within a separate container (not shown) which may be removed from within casing 1 when the fuel supply therein is exhausted. The form of lighter shown in Fig. 1 is provided with a burner structure comprising a fitting 3 located at the top wall 4 of the casing and provided with a fuel passageway 5 which should be understood as being in communication with the chamber 2 at its inner end, and with a valve mechanism interposed

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between the fuel passageway 5 and chamber 2, as hereinafter described in greater detail.

The form of lighter illustrated in Fig. 1 is also shown as having a cap 6, sparking wheel 7, and a fingerpiece 8, mounted in a row along the top of wall 4 of casing 1. The cap 6 and sparking wheel 7 may be understood as mounted for angular movement about the spindle 9 supported between ears 10 extending up from the top wall 4 of the casing, in such manner that the cap 6 will swing between the position shown in Fig. 1 in which it covers the mouth of the fuel passageway 5, to an open position displaced about 90° clockwise from the position shown, to expose the fuel passageway. The fingerpiece 8 should be understood as movable between the idle position shown in Fig. 1, to an active, depressed position wherein the cap 6 is moved to fuel passageway exposing position as above described, and during this same movement of the fingerpiece 8, the sparking wheel 7 is rotated to project sparks into a stream of gas issuing from passageway 5. For example the fingerpiece 8 may be provided with a reciprocable plunger 10a against which a compression spring 11 acts to urge the fingerpiece toward the idle position shown in Fig. 1, and teeth 12 on the fingerpiece may be understood as meshing with complementary teeth 13 fixed with respect to the cap 6, in such manner that when the fingerpiece is manually depressed, the cap 6 swings to open position as above described, and when manual pressure on fingerpiece 8 is released, the cap 6 swings to the fuel passageway covering position shown in Fig. 1. An appropriate form of pawl and ratchet construction not illustrated or described in detail since usable forms thereof are known in the art, will also be understood as interposed between the cap 6 and the sparking wheel 7, in such manner that the sparking wheel 7 rotates to project sparks into the stream of fuel issuing from fuel passageway 5, during the movement of fingerpiece 8 from idle to active position, this pawl and ratchet mechanism allowing the sparking wheel 7 to remain stationary while the fingerpiece is moving from active position back to the idle position shown in Fig. 1. It will be understood that a piece of sparking metal 14 is appropriately pressed against the sparking wheel 7, and the structural features above referred to will not be described in further detail since appropriate forms thereof are known in the art.

In accordance with one feature of the present invention, I provide in the path of fuel flowing from chamber 2 through passageway 5, a valve

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member 15 which is moved to closed position to shut off the flow of fuel through passageway 5 by the cap 6 when the latter moves into burner covering position, this valve being released for movement to open position when the cap 6 moves from burner covering to burner exposing position. Preferably the valve 15 is provided with a stem 16 which protrudes loosely through the passageway 5 as shown, so as to afford a flow of fuel around stem 16 when the valve is open, the protruding end of stem 16 being engageable with a wall 17 of cap 6, when the cap moves into burner covering position. As shown, the valve 15 cooperates with a valve seat member 18 in the form of a disk having a fuel feeding opening 19 therethrough, the valve 15 being loosely received in a chamber 20 within the fitting 3. The gaseous fuel in the passageway 19 will be under slight pressure, sufficient to lift valve 15 off its seat, when cap 6 is opened by manual pressure on the fingerpiece 8, the fuel then passing through chamber 3 around the valve 15 and up through the passageway 5, to be ignited by sparks produced by sparking wheel 7 as the cap 6 moves to open position. When manual pressure on the fingerpiece 8 is released, the pressure of spring 11 moves the cap 6 to burner covering position, this pressure being sufficient to hold the valve 15 in closed position to shut off the flow of fuel.

In the illustrated form of the invention, the valve seat member 18 is held in position by an annular nut member 21 which is screwed into the inner end of the fitting 3, and having therein a fuel conducting compartment 22 of which the apertured valve seat member 18 constitutes the upper wall, the nut 21 also serving to clamp the rim of the valve seat member 18 into sealing engagement with the adjacent annular internal shoulder in fitting 3 as shown. The height of the flame at the mouth of the burner, will tend to fluctuate with changes in temperature in the fuel chamber 2 and consequent changes in pressure, and to counteract this tendency I prefer to provide in the fuel conducting compartment 22 a fuel flow regulating member 23 which has a relatively large coefficient of expansion as compared to the wall structure of the compartment as a whole and which serves to constrict the flow of fuel to the duct 19 by its consequent relatively greater expansion, as the temperature increases, and vice versa. In the form of the invention illustrated in Fig. 1, the upper end wall of this regulating member 23 is provided with a recess 24 which receives the lower end of the duct 19, and a threaded plug 25, which constitutes the lower end wall of the compartment 22, is so adjusted that the gaseous fuel entering the compartment 22 from chamber 2 is compelled to flow through the restricted space between the upper end wall of regulating member 23, and the adjacent wall of valve seat member 18, the adjustment of the plug 25 being such that at mean temperature, a flame of the desired height will be produced at the mouth of the burner. Upon increase in temperature the relatively greater expansion of the regulating member 23 will proportionately constrict the flow of fuel through the burner and thereby prevent the flame from increasing proportionately, and conversely upon decrease in temperature the relatively greater contraction of the regulating member 23 will afford a proportionately less constricted flow of fuel, to keep the height of flame substantially constant through the normal operating range in temperature. The fitting 3 and nut 21 for example may be

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constructed of metal such as brass, and the regulating member 23 may be of synthetic material of the nylon type, materials of this latter type being available which have a coefficient of expansion about ten times greater than brass so that sufficient flame regulation may be produced by a regulating member 23 which is only a small fraction of an inch in length, and adjustment of the length of flame being secured by adjustment of the plug 25. This plug 25 may be of porous material such as porous metal or porous ceramic, which will admit fuel in gaseous form into compartment 22 from chamber 2, but will tend to trap fuel in liquid form, which will usually be present in chamber 2, due to the substantial pressure obtaining therein, in such manner that only fuel in gaseous form passes the regulating member 23 to enter the duct 19.

In Fig. 2 I have shown a somewhat modified form of the invention wherein the elements 1, 2, 4, 5, 6, 7, 9, 15, 16, 17, may be understood as being the same as previously described, in construction and mode of operation. This form of the invention however is so arranged that the height of the flame may be adjusted from the exterior of the lighter, the fitting 3a receiving at its upper end, a threaded nut 26 in which the passageway 5 is provided, and this nut bearing upon a valve seat member 18a having therein a fuel conducting duct 19a, and the valve seat member 18a being forced by the nut 26 against an elastic bushing 27 which may be for example of synthetic rubber. This bushing 27 encloses the compartment 22a, and the regulating member 23a, which latter is similar to the previously described member 23 in function, a porous plug 25a being provided underneath the regulating member 23a, and which is in communication with the fuel chamber 2 through the duct 28 in the bottom wall of the fitting 3a. In this form of the invention, the mean clearance between the regulating member 23a and the valve seat member 18a will depend upon the extent to which the nut 26 presses downwardly on valve seat member 18a to compress the elastic member 27, and the nut 26 is accessible from the exterior of the lighter for adjustment, when cap 6 is open.

While the invention has been disclosed as carried out by the specific lighter structures above described, it should be understood that changes may be made therein without departing from the invention in its broader aspects within the appended claims.

I claim:

1. A gas fueled lighter structure of the character described including a casing having therein a chamber constructed to hold gaseous fuel under pressure, a burner member, and means affording flow of fuel from said chamber through said burner member including a fuel conducting compartment having an apertured wall through which the fuel flows, said compartment containing a fuel flow regulating member adjacent a wall of said compartment to cause fuel passing through said compartment and apertured wall to flow between said regulating member and the adjacent wall, said regulating member having different thermal expansion and contraction characteristics as compared to the wall structure of said compartment to cause said regulating member to move in the direction of said adjacent wall and decrease the flow space therebetween with increases in temperature, thereby to alter the flow of fuel between said regulating

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member and adjacent wall inversely with respect to changes of temperature.

2. A gas fueled lighter structure of the character described including a casing having therein a chamber constructed to hold gaseous fuel under pressure, a burner member, and means affording flow of fuel from said chamber through said burner member including a fuel conducting compartment through which the fuel flows, said compartment having opposed apertured walls through which the fuel flows respectively in passing into and out of said compartment, and a fuel flow regulating member interposed between said walls and spaced slightly from at least one of them to restrict the flow of fuel through said last mentioned wall, said regulating member having relatively large thermal expansion and contraction characteristics as compared to the wall structure of said compartment to cause said regulating member to move in the direction of said last-mentioned wall and decrease the flow space therebetween with increases in temperature, thereby to alter the spacing aforesaid inversely with respect to changes of temperature in said compartment.

3. A gas fueled lighter of the character described including a casing having therein a chamber constructed to hold gaseous fuel under pressure, a burner structure having a fuel passageway leading to a point adjacent the exterior of said casing, an apertured valve seat member interposed in said passageway, a valve member disposed on the delivery side of said valve seat member, said burner structure having a fuel conducting compartment on the entrance side of said valve seat member, and a fuel flow regulating member located in said compartment with one face thereof slightly spaced from said valve seat member to control the flow of fuel through the latter, said regulating member having relatively large thermal expansion and contraction characteristics as compared to the wall structure of said compartment to cause said regulating member to move in the direction of said valve seat member and decrease the flow space therebetween with increases in temperature, thereby to alter the flow of fuel from said compartment through said valve seat member inversely with respect to changes of temperature in said compartment.

4. A gas fueled lighter structure of the character described including a casing having therein a chamber constructed to hold gaseous fuel under pressure, a burner member, and means affording flow of fuel from said chamber through said burner member including a fuel conducting compartment through which the fuel flows, said compartment having opposed apertured walls through which the fuel flows respectively in passing into and out of said compartment, and a fuel flow regulating member interposed between said walls and spaced slightly from at least one of them to restrict the flow of fuel through said last mentioned wall, said regulating member having relatively large thermal expansion and contraction characteristics as compared to the wall structure of said compartment to cause said regulating member to move in the direction of said last-mentioned wall and decrease the flow space therebetween with increases in temperature, thereby

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to alter the spacing aforesaid inversely with respect to changes of temperature in said compartment, and additional means for relatively adjusting the positions of said last mentioned wall and regulating member, to alter the aforesaid spacing.

5. A gas fueled lighter of the character described, including a casing having therein a chamber constructed to hold gaseous fuel under pressure, a burner having a mouth adjacent the exterior of said casing and a fuel passageway leading thereto, said casing carrying a cap mounted to move between positions wherein it respectively overlies and exposes the mouth of the burner, a valve member reciprocally mounted in said fuel passageway to move between an inner closed position and an outer open position, said valve member having a reciprocable actuating stem connected thereto and extending outwardly along said passageway into position to be engaged by said cap as the latter moves into burner overlying position, and a spring urging said cap toward burner overlying position and into engagement with said stem to press the cap resiliently against said valve stem and thereby hold the fuel valve closed.

6. A gas fueled lighter of the character described, including a casing having therein a chamber constructed to hold gaseous fuel under pressure, a burner fixedly mounted with respect to said casing, said burner having a mouth adjacent the exterior of said casing and a fuel passageway leading thereto, said casing carrying a cap mounted to move between positions wherein it respectively overlies and exposes the mouth of the burner, a valve member reciprocally mounted in said fuel passageway to move between an inner closed position and an outer open position, said valve member having a reciprocable actuating stem connected thereto and loosely received within said fuel passageway to afford flow of fuel through the space surrounding said stem, to the mouth of the burner, said stem extending outwardly through said mouth of said burner into position to be engaged by said cap as the latter moves into burner overlying position, and a spring urging said cap toward burner overlying position and into engagement with said stem to press the cap resiliently against said valve stem and thereby hold the fuel valve closed.

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## REFERENCES CITED

The following references are of record in the file of this patent:

## UNITED STATES PATENTS

Number	Name	Date
1,508,600	Guinn -----	Sept. 16, 1924
1,578,430	Guinn -----	Mar. 30, 1926
1,813,122	Moore -----	July 7, 1931
2,513,720	Hallinan -----	July 4, 1950

## FOREIGN PATENTS

Number	Country	Date
678,165	Germany -----	July 10, 1939
787,706	France -----	July 8, 1935
815,729	France -----	Apr. 12, 1937

**Certificate of Correction**

Patent No. 2,620,643

December 9, 1952

WARREN I. NISSEN

It is hereby certified that the name of the assignee in the above numbered patent was erroneously described and specified as "Ronson Art Metal Work, Inc." whereas said name should have been described and specified as *Ronson Art Metal Works, Inc.*; and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of April, A. D. 1953.

[SEAL]

THOMAS F. MURPHY,  
*Assistant Commissioner of Patents.*

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