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2,672,038

GAS LIGHTER VALVE

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Fig. 3.

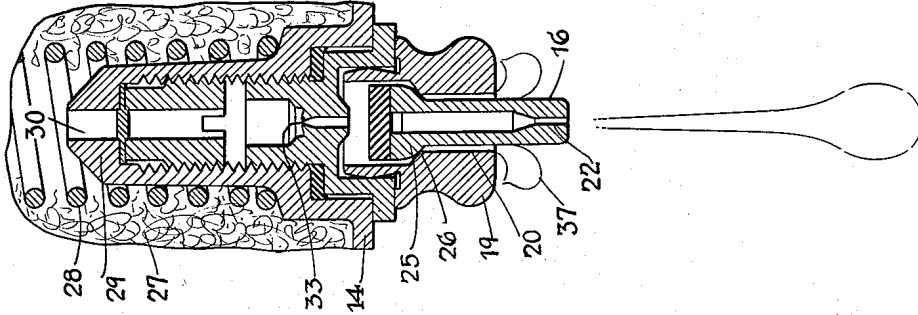


Fig. 4.

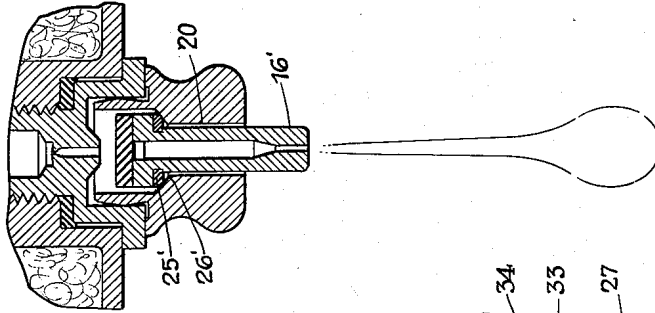


Fig. 1.

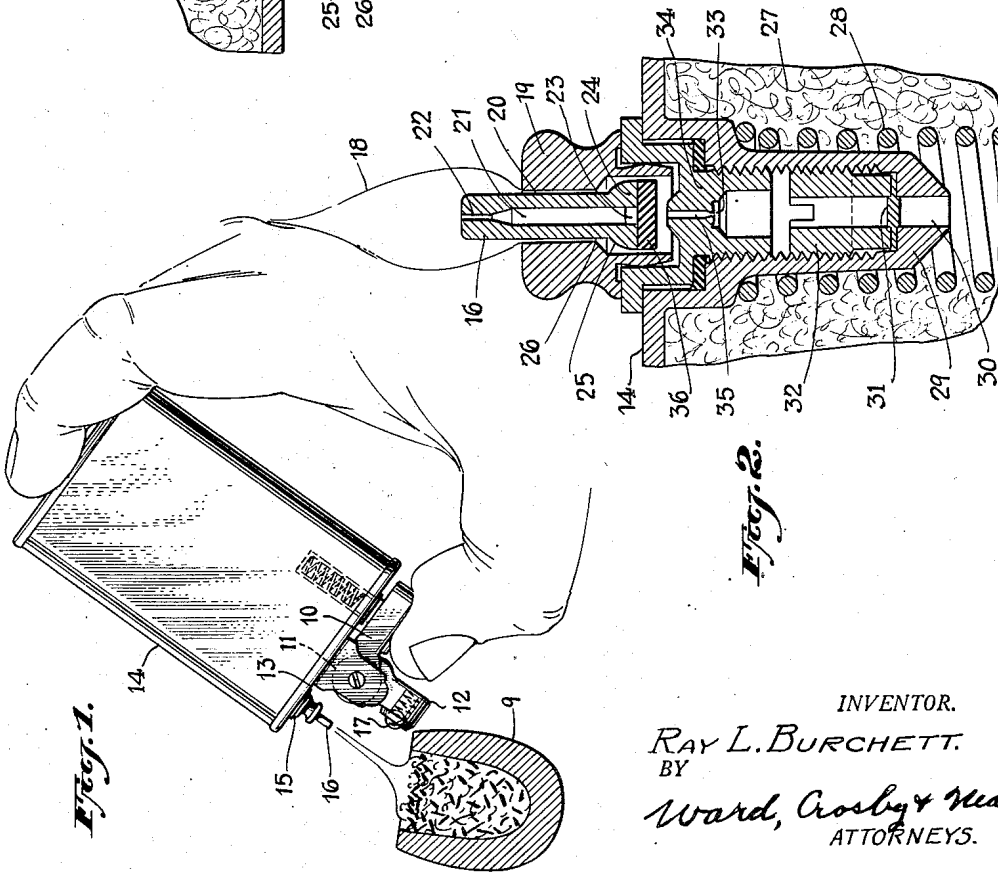


Fig. 2.

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GAS LIGHTER VALVE

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4 Claims. (Cl. 67—7.1)

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This invention relates to a novel valve construction, which, among other possible uses, is particularly adapted for controlling the flow of gas at the burner in lighters such as are used for lighting cigars, cigarettes or pipes, and which utilize butane or other gas as fuel.

Such lighters are normally and conveniently held upright when being used to light cigars or cigarettes, that is, with the orifice of the burner just below the ends of the cigar or cigarette. And for that purpose the cross-sectional area of the flame is preferably made large enough uniformly to ignite the whole end surface of the cigar or cigarette. It is also desirable for safety reasons in lighting cigars and cigarettes that the flame not extend up too high above the burner orifice. On the other hand, when tobacco contained in the bowl of a pipe is to be ignited, it is desirable to hold the lighter in an inverted position so that the flame will tend to be directed down into the pipe to ignite the tobacco without holding the pipe in an unnatural position. However, if the common forms of lighters using either liquid or gaseous fuel are inverted for pipe lighting purposes, the flame if of a form desirable for cigarette lighting, will tend to stream back against the burner and the lighter body instead of being projected downwardly.

In accordance with the present invention, a gas valve is provided of such construction that when the flame is in upright position as for lighting cigarettes, it will be of a relatively "fat" cross-section and not extend too high to be safe and convenient for that purpose. But if, on the other hand, the burner is inverted for pipe lighting purposes, then automatically the valve will act to produce a flame which will be projected forcefully downward as a jet and with a quite narrow cross-section for a considerable distance, the flame finally terminating in a bulged-out portion, of such size and sufficiently spaced below the burner orifice so that it will fully ignite the surface of the tobacco in the pipe bowl even though the level of the tobacco is considerably below the rim of the pipe bowl.

With the presently preferred form of the invention, a valve means for this purpose is provided having therein a member which, when the burner is upright, allows gas to escape in a way suitable for the cigarette lighting flame, but when the burner is inverted, the effect of gravity on this member is such that it will shift its position and provide a burner outlet orifice such as to produce a forceful downward jet of the burning gas.

Other and more specific objects, features and

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advantages of the invention will appear from the detailed description given below, taken in connection with the accompanying drawings which form a part of this specification and illustrate by way of example the presently preferred embodiments of the invention.

In the drawings:

Fig. 1 is a perspective view of one form of lighter embodying the invention and being held and operated in a position for lighting tobacco in the bowl of a pipe;

Fig. 2 is a vertical sectional view of the novel valve means in upright position for producing a flame such as desirable for cigarette lighting purposes;

Fig. 3 is a view like Fig. 2 except showing the burner in inverted position for producing a downwardly projected jet flame; and

Fig. 4 is a view similar to Fig. 3 but showing a somewhat modified form of construction.

Referring now to the drawings in further detail, Fig. 1 illustrates a lighter constructed in accordance with the invention, being operated to light tobacco in the bowl 9 of a pipe. This lighter, for example, may have a well known form of spring restored depressible fingerpiece 10, pyrophoric lighting means at 11 and a pivoted snuffer 12, operatively interconnected and mounted upon the top 13 of a fuel receptacle 14 in the manner disclosed, for example, in the patent to Louis V. Aronson, No. 2,002,845. However, the construction of that patent, for the purposes of the present invention, is supplemented with features adapting the fuel container to receive butane or other gas under pressure and maintained partially liquefied if desired. Also a gas burner indicated generally at 15, is provided, having a valve operated by a depressible stem 16, the valve being normally held closed by the action of a spring-pressed ball 17 in the snuffer 12 when the latter is in closed position. Constructions as of Fig. 1 as thus far described, have heretofore been marketed with a gas outlet at the valve such as to produce a flame of the relative proportions indicated at 18 in Fig. 2 and ideally suitable for cigar and cigarette lighting purposes.

The modified form of valve means adapting same to provide either a flame such as 18 in Fig. 2 or a pipe lighting jet flame as shown in Figs. 1, 3 and 4, will now be described with more particular reference to Fig. 2. Here it will be noted that the valve stem 16 is mounted within a post-like burner element 19 having a central aperture 20 within which stem 16 is slidable with sufficient clearance so as to provide an annular passage about the stem large enough for gas to

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pass up therethrough at a relatively low velocity, such gas serving to provide the major part of the fuel for a flame of the form shown at 18 when the burner is upright. The stem is formed with a central bore 21 which is considerably restricted at its upper end at 22. The stem at its lower end has a transverse slot 23 which brings the bore into communication with the space beneath the post 19. The lower end of the stem has a flanged portion 24 surmounted by a conical portion 25 which, when the stem is in elevated position as hereinafter described, is adapted to come into contact with a shoulder 26 on the interior of the post 19 and to thereby shut off the annular gas passage about the stem but leaving open the passage 21, 22.

The butane or other gas or liquefied gas is contained within a mass of cotton or the like 27, which is held away from the lower valve parts as by a helical spring 28. When the snuffer cap is raised, gas passes up into the valve body 29 through an aperture 30, thence through a filter plate 31 and through the central aperture of a bushing 32. The gas then passes through a suitably dimensioned orifice 33 of known type, formed in an orifice housing member 34, such housing member being threaded into the valve body portion 29, in the manner shown. The bore 35 just above the orifice 33 is normally closed by a suitable synthetic rubber or other resilient disc 36 adhered to the lower end of the stem 16, this disc as well as the stem normally being held down to seal off the orifice by reason of the spring-compressed ball 17 (Fig. 1) held in engagement with the upper end of the stem through the action of the usual fingerpiece restoring spring. But when the snuffer is raised from the burner as in Fig. 1, the pressure of the gas through the orifice 33 will cause the disc 36 and the stem carrying the same to rise to the position shown in Fig. 2, whereby gas, in effect metered by the orifice 33, passes up into the cavity beneath the post 19 and from there passes at relatively low velocity through the passage at 20, some gas also passing through the restricted bore 22 in the stem. But the passages 20 and 22, taken together, are large enough so that the velocity of the gas passing therethrough will not cause the flame to project abnormally high.

However, when the lighter and the valve mechanism are inverted, as shown in Fig. 3, gravity will cause the stem 16 to drop to the position here shown and the annular passage 20 will be closed off or substantially closed off by reason of the engagement of the portions 25, 26. Accordingly, under these conditions, all or substantially all of the gas discharged through the orifice 33 will be channeled through the restricted bore 22 in the outlet end of the stem and consequently its velocity upon discharge will be substantially greater than with the parts as shown in Fig. 1.

By a suitable peening operation, the size of the orifice 33 may be so adjusted as compared with the size of the restricted bore portion 22, that a flame will be produced of the approximate shape shown in Fig. 3 when the lighter is inverted. With gas pressures and a gas orifice such as heretofore commonly used in gas fuel pocket lighters, the flame may readily be made to extend downwardly with the shape shown in Fig. 3 for a distance of about an inch, if desired, and thus ample to easily light tobacco in the lower part of the bowl of a pipe. The lower part of this jet form of flame tends to spread or bulge out in the manner indicated, so that it is well adapted for light-

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ing uniformly a considerable surface area of the tobacco, yet the flame above this lower bulged out portion has a quite small cross-section, and thus same can readily be kept out of burning contact with the rim of the pipe bowl.

It is not essential that the annular passage at 20 be completely sealed off by the engaging portions 25, 26 and in fact slight leakage past these portions may be desirable and will cause a small annular pilot-like flame as indicated at 37, insuring that the gas stream passing through the restriction 22 will remain lighted. In some cases the jet effect through the restriction 22 will be such that the gas tends to travel for some distance down before it is lighted, but the flame at 37 will insure that the jet flame will not be extinguished even if the lighter is moved about abruptly.

In case it is preferred more securely to seal off the gas passage at 20 when the lighter is inverted, the construction shown in Fig. 4 may be utilized, wherein the stem 16' at its inner end is embraced by a suitable resilient washer 25' for engaging the shoulder 26' on the burner post. In other respects the construction of the embodiment of Fig. 4 may be the same as or similar to that of Fig. 2.

A valve construction is thus provided according to the invention, which is operable to produce either a normal flame or a jet-like flame for pipe-lighting purposes, merely by inverting the lighter. Thus it is unnecessary to manipulate any mechanism or moving parts to adjust the flame for either purpose and the valve is such that it may be manufactured at substantially no greater cost than gas lighter valves heretofore known and which were adapted only for producing the normal cigarette lighting form of flame.

Furthermore, the construction is such that regardless of whether the normal flame or the jet-like flame is being produced, the fuel will be consumed at the same rate as determined by the orifice 33. Heretofore certain attempts to provide a satisfactory lighter for pipe lighting purposes have involved the difficulty of requiring the burning of fuel at a considerably increased rate with consequent necessity of replenishing the fuel in the lighter at inconveniently frequent intervals. Furthermore it may be noted that the modification of the flame from one type to the other takes place immediately and automatically upon inverting or restoring the lighter to upright position by a relatively quick movement of the hand. However, if desired, the weight of the stem 16 may be such that once it has assumed the position for creating a jet flame as in Fig. 3, the lighter may be slowly turned to upright position without movement of the stem, thereby, if desired also making possible an upright jet form of flame. The valve may of course be embodied in various types of lighting devices other than that shown in Fig. 1.

Although certain particular embodiments of the invention are herein disclosed for purposes of explanation, various further modifications thereof, after study of this specification, will be apparent to those skilled in the art to which the invention pertains. Reference should accordingly be had to the appended claims in determining the scope of the invention.

What is claimed and desired to be secured by Letters Patent is:

1. In a lighter construction having a reservoir for containing compressed gas, a burner valve comprising a valve stem, an orifice adjacent the inner end of said stem and normally closed

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thereby, a post having an opening within which said stem is vertically movable, whereby when the stem is released, it will be moved by the gas pressure to open said orifice, said post opening in conjunction with said stem being shaped to then provide a gas outlet of relatively large cross-sectional area, for forming a relatively wide and short flame, said stem being free to move further from orifice closing position by the action of gravity when the lighter is inverted, the stem in conjunction with the post opening being shaped to then substantially restrict the cross-sectional area of such gas outlet, for forming a jet-like and relatively elongated flame.

2. In combination with a lighter construction having a reservoir for containing compressed gas, a burner valve therefor having a gas outlet pressure control element movable to one position when the lighter is generally upright and to another position by the action of gravity when the lighter is generally inverted, said element when in said other position being shaped and arranged to confine the gas stream from the burner outlet to a relatively high pressure jet-like form for producing an elongated flame adapted for pipe lighting purposes, and said element when in said first-described position allowing escape of a less restricted and lower pressure gas stream for producing a shorter flame adapted for cigarette lighting purposes.

3. A gas burner and valve construction adapted when in generally upright position to produce a relatively short flame and when in generally inverted position to produce a relatively elongated flame, said construction comprising a member having an orifice for controlling the escape of gas from a reservoir, means forming a chamber at the outlet side of such orifice, such means having an opening and a stem member vertically slidable in such opening, the normally lower end of such stem having means to shut off the flow of gas through said orifice when the stem is depressed, the gas pressure serving to elevate the stem when released to open the orifice, said stem having sufficient clearance in said opening to then provide for the discharge of gas from said chamber at relatively low velocity to form a short flame, said stem also being formed

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with a restricted gas outlet passage from said chamber, and the stem upon inverting the construction being free to move by the action of gravity into a position to substantially shut off the gas flow through said clearance to then substantially confine the escape of gas to said restricted passage for providing a relatively higher pressure gas jet to produce the elongated flame.

4. A gas burner and valve construction adapted when in generally upright position to produce a relatively short flame and when in generally inverted position to produce a relatively elongated flame, said construction comprising a member having an orifice for controlling the escape of gas from a reservoir, means forming a chamber at the outlet side of such orifice, such means having an opening and a stem member vertically slidable in such opening, the normally lower end of such stem having means to shut off the flow of gas through said orifice when the stem is depressed, the gas pressure serving to elevate the stem when released to open the orifice, said stem having sufficient clearance in said opening to then provide for the discharge of gas from said chamber at relatively low velocity to form a short flame, said stem also being formed with a restricted gas outlet passage from said chamber, and the stem upon inverting the construction being free to move by the action of gravity into a position to nearly shut off the gas flow through said clearance to then largely confine the escape of gas to said restricted passage for providing a relatively higher pressure gas jet to produce the elongated flame, while at the same time a small amount of gas continues to flow through said clearance space to provide a pilot light.

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