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WINDSHIELD LIGHTER STRUCTURE

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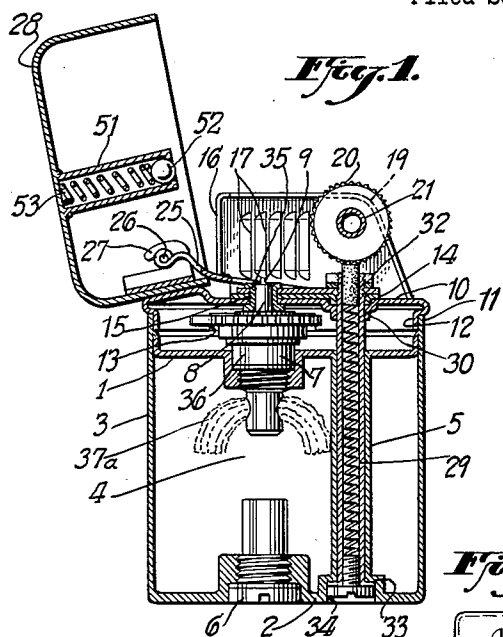


Fig. 1.

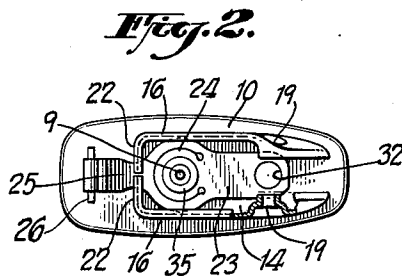


Fig. 2.

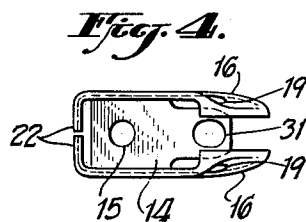


Fig. 4.

Fig. 5.

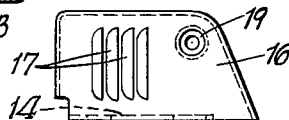


Fig. 6.

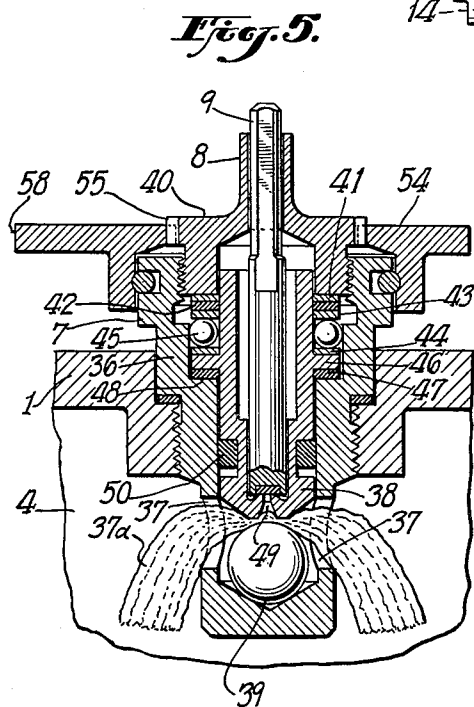
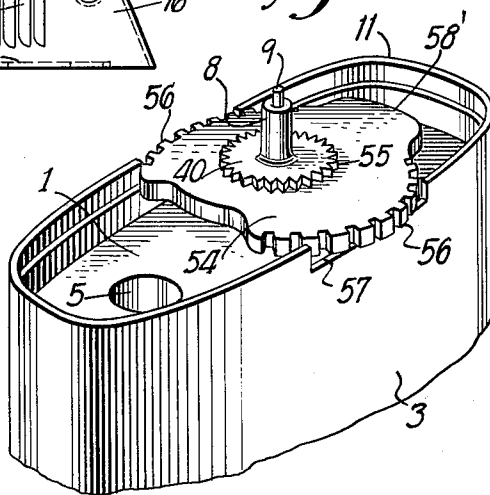


Fig. 5.



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WINDSHIELD LIGHTER STRUCTURE

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6 Claims. (Cl. 67-7.1)

The invention relates to a windshield lighter structure and in one of its aspects is particularly concerned with lighters fueled by combustible gas of the butane type i.e. gases such as butane or propane which assume gaseous form when released under usual atmospheric temperatures and pressures, but which remain largely in liquid form at such temperatures when held under sufficient pressure. In this aspect the invention relates particularly to the structural assembly used in a lighter of the above type, and involving an upper auxiliary top wall positioned in spaced relation to the top wall of the fluid tight casing proper in which the fuel supply is held, and with respect to which upper top wall an angularly movable flame height regulating member is coordinated as hereinafter described, in such manner as to be readily accessible for manual adjustment of the intermediate portion of the side wall of the lighter casing, whenever regulation of the flame height is desired.

In another aspect the invention relates more particularly to the correlation of the windshield structure with an auxiliary upper top wall of the character above referred to, in such manner that the flint tube structure of the lighter serves as a through bolt so to speak, for clamping the auxiliary top plate and the windshield structure and associated parts in working position. 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 a preferred form of lighter constructed 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 central vertical sectional view taken through a lighter of the so called thumb wheel or spin wheel type, which is constructed in accordance with the invention, such lighter including a cover which is shown in open position.

FIG. 2 is a top plan view of the lighter shown in FIG. 1, but with the cover and sparking wheel removed.

FIGS. 3 and 4 are respectively side and top plan views showing separately, the windshield structure which constitutes part of the lighter shown in FIGS. 1 and 2.

FIG. 5 is an enlarged central sectional view showing more in detail, a burner valve structure appropriate for use in a lighter as shown in FIGS. 1 and 2.

FIG. 6 is a perspective view of the upper portion of the lighter shown in FIG. 1, but with the upper auxiliary top plate and parts carried thereby removed, to show more in detail the flame height regulating member which is provided in conjunction with the burner valve.

The invention is disclosed as applied to a lighter having a fluid tight casing provided with top and bottom walls 1 and 2 respectively and a side wall 3, which walls enclose a fuel reservoir 4, the casing being also shown as provided with an interior tubular wall 5 which extends between the top and bottom walls 1 and 2 to provide a passageway for receiving a flint tube as hereinafter referred to in more detail. The bottom wall 2 is shown as provided with a fuel charging valve 6 which may be understood as of a type which will charge in fuel of the butane type. This charging valve is not shown or described in detail since appropriate forms thereof are known in the art.

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The top wall 1 of the casing is also shown as having mounted therein a gas burner valve mechanism denoted generally at 7 in FIG. 1. This valve mechanism will be described later in more detail but for the present may be understood as delivering gaseous fuel through a nozzle 8 in which is located a plunger 9 which opens the flow of gaseous fuel when free of downward pressure and closes off the flow of fuel when depressed as hereinafter described.

The lighter is provided with an auxiliary top wall 10 seating against upper side wall portions or extensions 11 which surround the space above the top wall 1, the auxiliary top wall 10 being shown as provided with a downwardly projecting flange 12 which fits within the side wall extensions 11. The auxiliary top wall 10 also has an opening 13 (FIG. 1) in line with the burner valve mechanism 7 so that the nozzle member 8 thereof may project upwardly through opening 13 to deliver gaseous fuel to the space above top wall 10.

Mounted upon the top wall 10 is a windshield structure which substantially surrounds the space above the opening 13, this windshield structure being shown as having a base 14 (FIG. 4) which seats against upper top wall 10 and is provided with an opening 15 therethrough which registers with the opening 13 above referred to. The windshield structure is also provided with upstanding opposite side walls 16 having slots 17 therethrough which admit air to form a combustible mixture with the gaseous fuel issuing from the burner.

The side walls 16 are extended to the right as the parts appear in the drawings, to provide hubs 19 between which a sparking wheel 20, which may be of the so called thumb wheel type, is mounted on a stud 21. The side walls 16 of the windshield structure are also shown as extended to the left as the parts appear in the drawings, and returned to provide wings 22 (FIGS. 2 and 4) which shield the space to the left of openings 13 and 15 through which the gaseous fuel is delivered.

A spring member 23 (FIG. 2) seats on top of the base 14 of the windshield structure, this spring being shown as provided with a tab 24 which is aligned with the openings 13 and 15 above referred to, and has a spring arm 25 (FIG. 1) carrying at its outer end a cross pin 26 which is received within the hook shaped lugs 27 on the inside of a cover member 28 which seats against the upper top plate 10. In this way the cover may be held selectively in the open position shown in FIG. 1, or in closed seating position.

A flint tube 29 is slidably and rotatably received within the tubular wall 5 of the main lighter casing, and is utilized to clamp the auxiliary upper top wall 10, the windshield structure and the cover spring 23 in working position. In the form shown, the auxiliary upper top plate 10 is provided with an opening 30 (FIG. 1) and the base 14 of the windshield structure is provided with an aligned opening 31 (FIG. 4) through which the upper end portion of the flint tube may be understood as passing, and engaging with an interiorly threaded nut 32 (FIG. 2) on the end of spring member 23. The bottom end of the flint tube is shown as provided with a flange 33 (FIG. 1) which fits rotatably in a socket 34 in the bottom wall 2 of the main lighter casing, and thus by twisting the flint tube 29 the auxiliary upper top wall 10 and the parts mounted thereon may be drawn into, and detachably clamped in working position. A flint is to be understood as held within the flint tube 29 and pressed against the sparking wheel 20 by an adjusting screw and spring, but these parts are not described in detail since appropriate forms thereof are known. The auxiliary upper top wall 10 and the parts carried thereby may be preliminarily clamped in proper relation to each other, as by an eyelet

35 (FIGS. 1 and 2) which passes through the openings 13, 15 and the tab 24.

Turning now to the phase of the invention which involves regulation of the flame height in a lighter of the gaseous fuel type, a form of gas burner valve mechanism appropriate for such purposes will first be described more in detail. Referring more particularly to FIG. 5, the valve mechanism is shown as provided with a housing 36 which is mounted in sealed relation in the main top wall 1 of the lighter casing. The inner portion of the housing projects into the fuel reservoir 4 and is shown as provided with openings 37 through which a length of porous compressible material 37a such as wicking passes, to conduct fuel in liquid form from the fuel reservoir 4 into the interior of the valve housing 36. The rate of flow of fuel up through the burner valve mechanism is regulated by a pressure member 38 which is mounted for up and down movement within the housing 36 and applies accurately regulated compression to the wicking 37a by clamping the latter against a ball 39 seated in the inner end of housing 36.

Regulated pressure may be applied to the member 38 by a nut member 40 having threaded engagement with the upper portion of the valve housing 36, and bearing downwardly against a ring 41 which in turn bears against an elastic compressible washer 42, the pressure being then transmitted through race members 43 and 44, and ball members 45 to an annular flange 46 on the member 38, a further elastic compressible washer 47 being interposed between the flange 46 and an annular shoulder 48 in member 38 and against which shoulder the washer 47 seats. When the nut 40 is turned in the direction to increase the pressure on member 38, the washers 42 and 47 will be further compressed and member 38 will move down a lesser distance toward ball 39 to further restrict the flow of liquid fuel through the annular compression zone in wicking 37a, which compression zone is formed by the pressure applied by member 38. The central passageway 49 in the inner end portion of member 38 constitutes a chamber into which the fuel evaporates and passes out through the mouth of the burner when the valve is open, as later more specifically described. Thus by increase in the pressure applied by member 38 fine regulation of the rate of flow of the fuel through the valve mechanism and consequently the height of the flame at the mouth of the burner, may be obtained. When the pressure on member 38 is lessened by turning nut 40 in the opposite direction, the elasticity of the washers 42 and 47 lifts the member 38 slightly to relieve the pressure on wicking 37a, and the rate of flow of fuel through the valve is increased. A sealing ring 50 may be provided to maintain a tight joint between housing 36 and pressure member 38.

In the illustrated form of the invention plunger 9 previously referred to is utilized to open and close the burner valve mechanism. As shown (FIG. 1) the cover member 28 is provided with an internal shell 51 containing a ball 52 urged by a spring 53 into the position shown in FIG. 1. The gaseous pressure of the fuel under the conditions shown in FIG. 1 is sufficient to unseat the plunger 9 from the valve closing position with respect to passageway 49 which is shown in FIG. 5. But when the cover 28 is moved to closed position the ball 52 presses the plunger 9 into the valve closing position shown in FIG. 5.

Manual regulation of the flame height is secured through an angularly movable member 54 (FIG. 6) received in the space between the top wall 1 and the auxiliary top wall 10, and which is accessible for manual adjustment through the upper side wall extensions 11. As shown in FIG. 6 this member 54 may have splined engagement as indicated at 55 with the nut member 40 in such manner as to be engageable therewith in different angular positions of member 54. This member 54 may also have serrated peripheral portions as indicated at 56 which project through notches 57 in the upper side wall

extension 11 of the main casing. These exposed peripheral portions 56 of member 54 enable the user to twist the member 54 manually and thereby adjust the nut member 40 to regulate the flame height. Preferably the member 54 is provided with a lug 58 (FIG. 6) which by engagement with the side wall extensions 11 limits the angular movement of member 54 to thereby limit the range in flame height to which the lighter may be adjusted. Before the member 55 is initially attached, the nut member 40 may be initially set for example to a selected minimum flame height, and the member 54 then attached in such angular position that lug 58 is at one limit of its angular movement. Then assembly of the lighter may be completed and angular movement of member 54 to the other limit of its stroke will adjust the flame to the maximum height which the lighter is set up to afford. This prevents accidental adjustment of the lighter to produce a flame of abnormal extent.

While the invention has been disclosed as embodied in a lighter of the above described specific form, it should be understood that changes may be made therein without departing from the invention in its broader aspects within the scope of the appended claims.

I claim:

1. A gas fueled lighter structure of the windshield type including a fluid tight casing forming a fuel reservoir, said casing having a top wall, gas burner valve mechanism mounted in said top wall, an auxiliary top wall, means mounting said auxiliary wall in upwardly spaced relation with respect to the top wall of the casing proper, said auxiliary wall having means defining an opening in connection with said valve mechanism, a windshield structure disposed above and supported by said auxiliary top wall, flint means disposed within said windshield structure for igniting said fuel, means for regulating the height of the flame produced by the lighter comprising a member movably mounted in the space between said top walls, said casing having side wall portions extending between said top walls, at least one of the aforesaid side wall portions having an opening therein through which said movably mounted member is accessible for manual adjustment exteriorly of said side wall portions.

2. A lighter of the windshield type having a fluid tight casing forming a fuel reservoir, said casing having a top wall and a bottom wall and a flint tube receiving passageway extending therethrough and also having upper side wall portions bounding the space above said top wall, an auxiliary top wall seated on said portions in spaced relation to said first mentioned top wall, a burner mounted in said first mentioned top wall in position to deliver gas from fuel reservoir to the space above said auxiliary top wall, said auxiliary top wall having means defining an opening in communication with said burner, a windshield structure disposed above and supported by said auxiliary top wall, said flint tube receiving passageway extending through said top wall and said bottom wall and said auxiliary top wall and said windshield structure, and means for clamping said auxiliary top wall and windshield structure in position comprising a flint tube extending upwardly through said passageway, means at the upper end of said flint tube substantially engaging said windshield structure, and means at the lower end of said flint tube substantially engaging said bottom wall, whereby clamping pressure is applied substantially between said windshield structure and bottom wall.

3. A lighter of the windshield type according to claim 2, wherein at least one of the last said means at the respective ends of said flint tube comprises removable nut means.

4. A lighter of the windshield type having a fluid tight casing forming a fuel reservoir, said casing having a top wall and a bottom wall and a flint tube receiving passageway extending therethrough and also having upper side wall portions enclosing the space above said top wall, an auxiliary top wall seated on said portions in spaced rela-

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tion to said first mentioned top wall, a burner mounted in said first mentioned top wall, said auxiliary top wall having an opening therein to afford passage of fuel to the space above said auxiliary wall, windshield structure supported by said auxiliary wall and substantially enclosing the space above said opening, said windshield structure also having a sparking wheel mounted therein in substantial alinement with said flint tube receiving passageway, a cover structure pivotally mounted at an end thereof and constructed to seat against said auxiliary top wall, a spring member having one end disposed on said windshield structure and having another end adapted for engaging said cover to retain said cover in its said seated engagement, said flint tube receiving passageway extending through said top wall and said bottom wall and said auxiliary top wall and said windshield structure and said one end of the spring member, and means for clamping said auxiliary top wall, windshield structure and spring member in working position comprising a flint tube extending upwardly through said passageway, means at the upper end of said flint tube substantially engaging said one end of the spring member, and means at the lower end of said flint tube substantially engaging said bottom wall, whereby clamping pressure is applied substantially between said spring member and said bottom wall.

5. A lighter of the windshield type according to claim 4, wherein at least one of the last said means at the respective ends of said flint tube comprises removable nut means.

6. A lighter structure having a fluid tight casing forming a fuel reservoir, said casing having a top wall and upper side wall portions bounding the space above said

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top wall, an auxiliary top wall seated on said portions in spaced relation to said first mentioned top wall, a burner mounted in said first-mentioned top wall and disposed between said first mentioned top wall and said auxiliary top wall in position to deliver gas from said fuel reservoir to the space above said auxiliary top wall, said auxiliary top wall having means defining an opening in communication with said burner, a windshield structure disposed above and supported by said auxiliary top wall, flint means disposed within said windshield structure for igniting said fuel, and means for regulating the height of flame produced by the lighter comprising a member movably mounted in the space between said top walls and engaging said burner, at least one of the aforesaid side wall portions having an opening therein through which said movably mounted member is accessible for manual adjustment exteriorly of said side wall portion.

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