June 1, 1965 R. L. BURCHETT 3,186,603

REGULATABLE LIGHTER VALVE

Filed Oct. 11, 1962 2 Sheets-Sheet 1

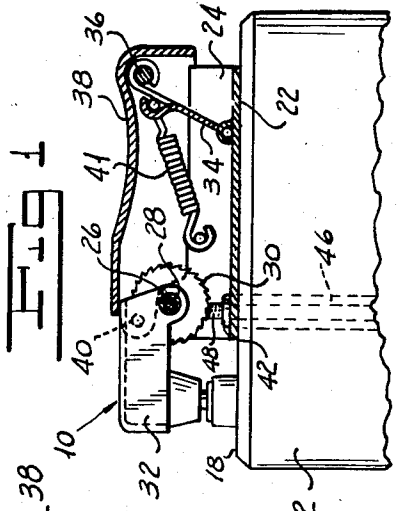

FIG. 1

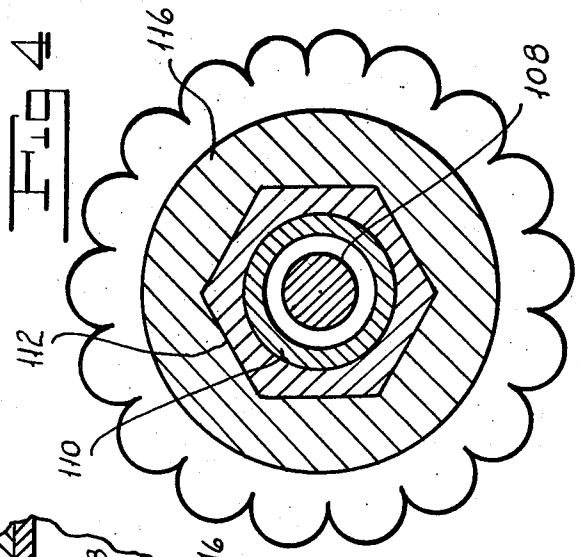

FIG. 4

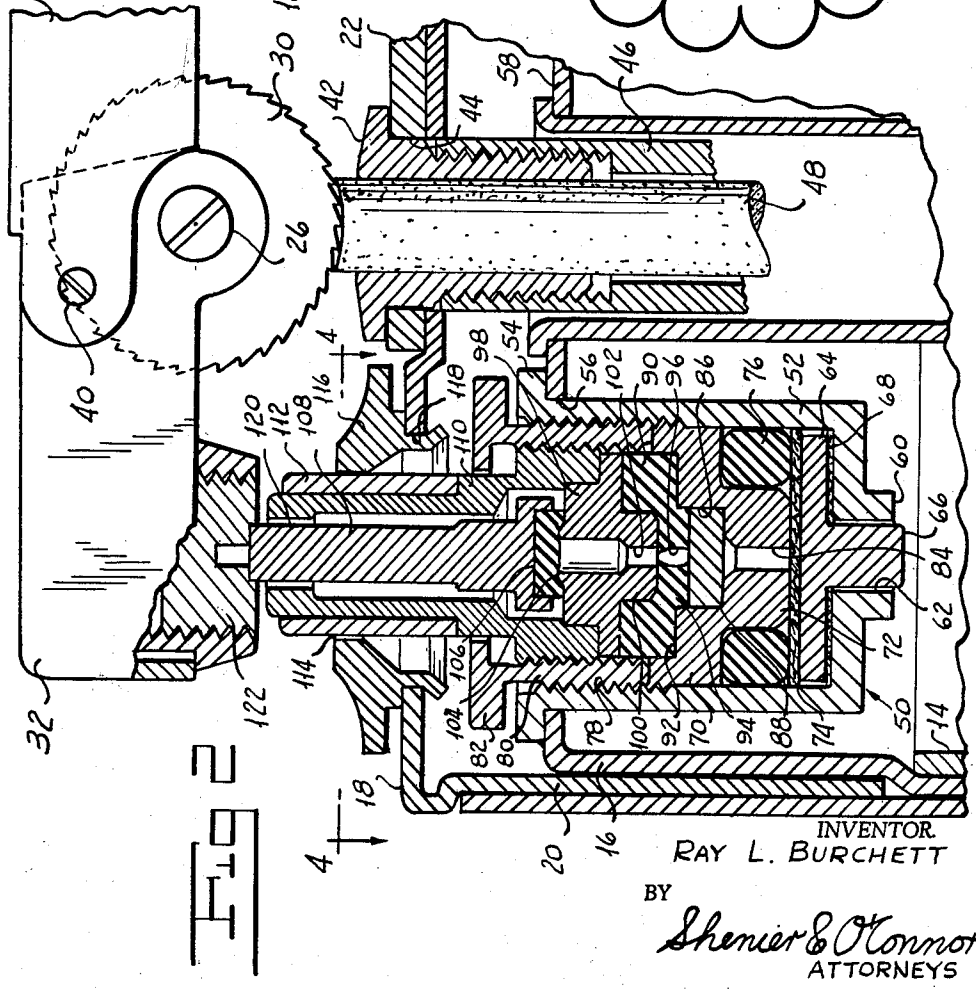

FIG. 2

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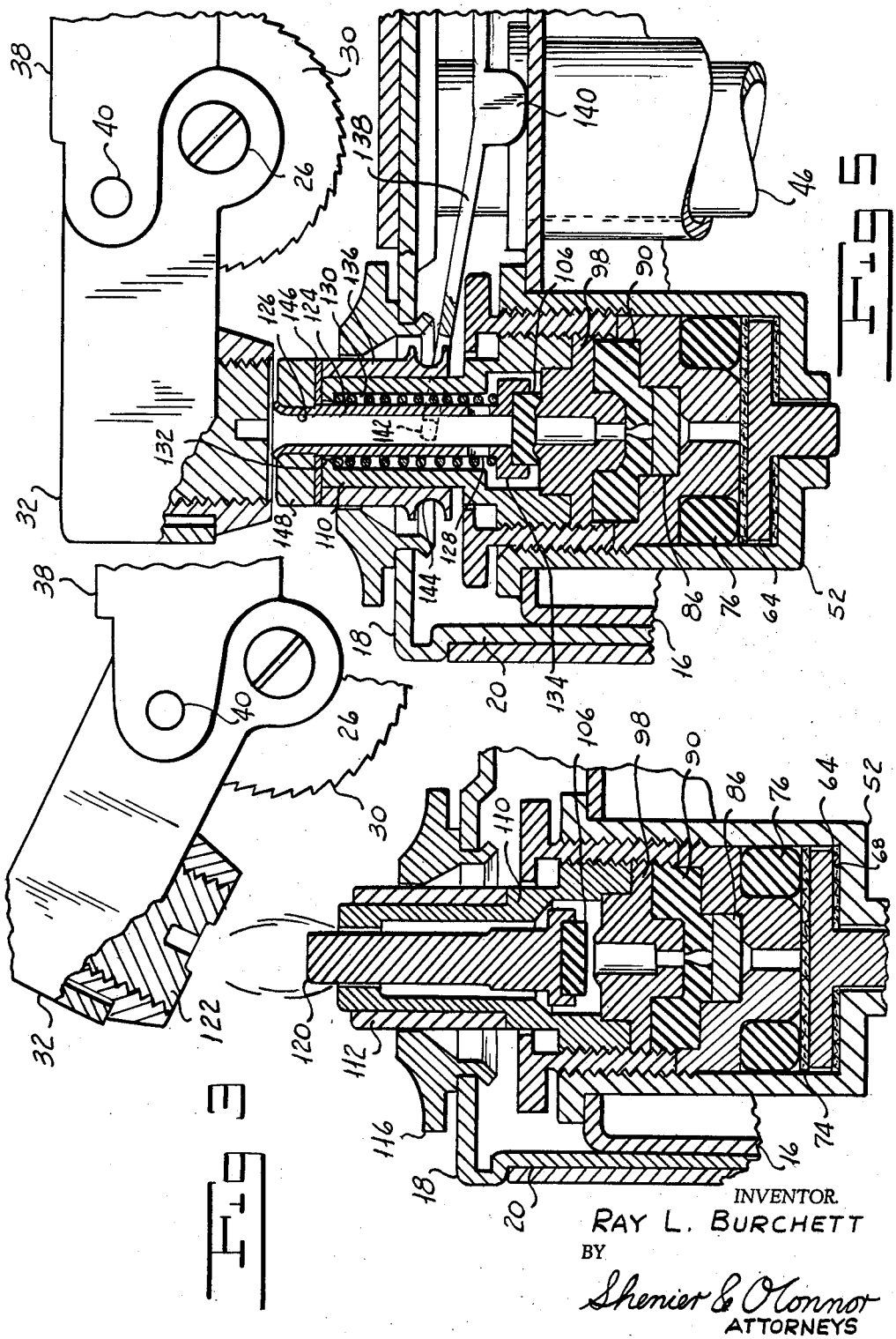

FIG. 5

FIG. 3

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REGULATABLE LIGHTER VALVE

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7 Claims. (Cl. 222—189)

My invention relates to a burner valve for gas fueled lighters and more particularly to an improved burner valve construction which will not readily clog and which is provided with an improved flame height adjusting feature.

Various forms of burner valves are known for lighters which use liquified gas fuel. Relatively complicated mechanisms are employed to prevent the fuel in liquid form from entering the valve proper. These expedients have created additional problems since they are prone to becoming clogged by foreign matter entering the valve assembly. Moreover, they may result in leakage of the fuel or dangeous flare-ups. As a result of changes in temperature the flame height may vary greatly.

In an attempt to overcome the problem of variation in flame height, in the prior art it has been suggested that the burner valve assembly be provided with a means adapted to be operated by the user for regulating flame height. These efforts have not proved satisfactory for the reason that where such regulation is entirely under the control of the user it often becomes maladjusted, thus requiring repair.

I have invented a regulatable lighter valve which overcomes the defects of valve assemblies of the prior art pointed out above. My regulatable lighter valve is so constructed that foreign matter cannot readily reach the valve orifice so that the danger of clogging is substantially eliminated. I provide my regulatable lighter valve with a flame height adjustment feature which can be operated by the user without the danger of preventing the lighter from functioning properly. My regulatable lighter valve provides respective factory-made and user adjustments. My valve is readily adapted for either normally open or normally closed operation.

One object of my invention is to provide a regulatable lighter valve which will not clog.

Another object of my invention is to provide a regulatable lighter valve with independent factory and user flame height adjustments.

A further object of my invention is to provide a lighter valve construction which is readily adapted to either normally open or normally closed operation.

Other and further objects of my invention will appear from the following description.

In general my invention contemplates the provision of a burner valve for a gas fueled lighter in which a first means providing restricted communication to the interior of the fuel reservoir can be adjusted during the assembly of the lighter in the course of its manufacture by means normally housed by the lighter case. A second opening in series with the first can be adjusted by means accessible to the user to adjust flame height within the limits permitted by the adjustment made in the course of manufacture of the lighter.

In the accompanying drawings which form part of the instant specification and which are to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views:

FIGURE 1 is a fragmentary elevation of one form of lighter with which my regulatable valve can be employed with parts shown in section.

FIGURE 2 is a fragmentary sectional view of the lighter shown in FIGURE 1 illustrating the details of my regulatable lighter valve.

FIGURE 3 is a fragmentary sectional view of my regulatable lighter valve illustrating the position of the parts with the valve open.

FIGURE 4 is a sectional view of my regulatable lighter valve taken along the line 4—4 of FIGURE 2 and drawn on an enlarged scale.

FIGURE 5 is a fragmentary sectional view of a normally closed form of my regulatable lighter valve.

Referring now to FIGURES 1 to 4 of the drawing, one form of lighter indicated generally by the reference character 10 with which my valve can be used includes an outer casing 12 which fits over a reservoir including a lower portion 14 telescoped within an upper portion 16 and secured to the upper portion 16 with a gas-tight seal to permit the reservoir to contain a supply of a suitable fuel such, for example, as liquified petroleum gas. A frame 18 has legs 20 which are frictionally held on the sides of the upper reservoir portion 16. I secure the base 22 of a bracket having side walls 24 to the frame 18. A bushing 28 secured to the side walls 24 by any suitable means such as by a screw 26 carries an abrasive wheel 30. Screw 28 also pivotally supports a snuffer 32. A link 34 pivotally connected at one end to the base 22 has its other end pivotally secured to a shaft 36 carried by the thumbpiece 38 of the lighter.

I employ any suitable means such, for example, as screws 40 to connect the thumbpiece to the snuffer 32. A spring 41 connected between one of the walls 24 and the link 34 normally urges the parts to a position at which the snuffer 32 is down and the thumbpiece 38 is up as shown in FIGURE 1. A flint guide 42 passing through an opening 44 in the base 22 carries a flint tube 46 which houses a flint 48 which is urged to move into contact with the wheel 30. As is known in the art when the thumbpiece 38 is pressed toward the base 22 wheel 30 rotates to strike a shower of sparks from the flint.

My regulatable valve assembly indicated generally by the reference character 50 includes a housing 52 having a peripheral flange 54. I insert the housing 52 through an opening 56 in the top 58 of the reservoir and weld or otherwise secure the housing 52 in this position. A port 60 in the bottom of housing 52 provides a passage 62 for admitting gas to the interior of the housing. A dispersion plate 64 disposed within the housing 52 has a shank 66 extending into the passage 62. I place pierced filtering material 68 between the plate 64 and the bottom of the housing 52.

A first gas pressure regulator 70 disposed within the housing 52 for sliding movement has a reduced portion 72 which bears against pierced filtering material 74 over the plate 64. A resilient washer 76 which may be an O-ring surrounds the reduced portion 72 of the first gas pressure regulator 70.

I provide the inside surface of the housing 52 adjacent the top thereof with threads 78 adapted to receive a threaded sleeve 80 having a head 82. When the head 82 is turned in a clockwise direction, for example, as viewed from the top the regulator 70 is driven down toward the base of the housing 52. In the course of this movement the O-ring 76 is deformed to cause it to conform to the shape of the space between the reduced portion 72 and the wall of the housing 52. At the same time the lower end of the regulator 70 exerts a pressure on the filter 74 to restrict the flow of gas into a passage 84 formed in the portion 72.

From the structure thus far described it will be apparent that gas flows from the inside of the reservoir through the space between the wall of passage 62 and the shank 66 through the filtering material 68 around the edge of the dispersion plate 64 and through the filtering material 74 to the passage 84. The rate of gas flow is determined

by the adjustment of the sleeve 80. I so arrange the parts that if desired the flow of gas may be entirely cut off. In practice however this is intended to be a factory adjustment which determines the maximum possible flame height of, for example, one and one-half inches. In a manner to be described the flame height may be reduced by the user from this maximum.

The bore or passage 84 leads into an enlarged bore portion 86 which receives a blocking disc 88 around which gas from the passage 84 flows. I dispose a resilient flame height adjuster 90 over the disc 88. The adjuster 90 rests on a shoulder 92 formed in the regulator 70 and has a central portion 94 forming a passageway 96 to permit gas passing around the disc 88 to flow upwardly through the flame height adjuster 90. A pressure plate 98 has a central boss 100 which bears on the portion 96 of the adjuster 90. A passage 102 permits the flow of gas from the passage 96 upwardly through the plate 98. I form the upper end of passage 102 with a seat 104 for receiving a resilient washer 106 carried by the valve 108. I thread an actuator 110 within the sleeve 80 so that when the actuator is rotated it moves up or down within the sleeve 80. The actuator 110 carries a member 112 having a hexagonal shaped outer periphery for movement therewith. The actuator 110 and the member 112 extend upwardly through an opening 114 in a rotatable element 116 supported in an opening 118 in the top of the frame 18. The stem of the valve 108 extends upwardly through a guide opening 120 in the top of the actuator 110 to a position at which it can be engaged by a block 122 carried by the snuffer 32.

From the structure just described it will be apparent that when the wheel 116 is turned it rotates both the element 112 and the actuator 110. For example if it is rotated in a direction to move the actuator downwardly in the sleeve 80 it pushes plate 98 down to squeeze the flame adjustor 90 to tend to close the opening 96. In this way the rate at which gas passes through the opening 96 can readily be adjusted. It will be appreciated from the description given hereinabove that even where the actuator 110 has been backed out of the sleeve 80 to a point at which plate 98 exerts no appreciable pressure on the adjuster 90 a flame height of only one and one-half inches, for example, will be permitted. That is, the flame adjustment which is in response to operation of the wheel 116 is in adjustment which is within the maximum flame height which has been determined by the adjustment of member 82.

In operation of the form of the lighter and valve shown in FIGURES 1 to 4 after the adjustments described above have been made when the user actuates the thumbpiece 38 to rotate wheel 30 to strike a shower of sparks from the flint 48 snuffer 32 moves away from the valve stem 108 and the pressure of the gas within the reservoir lifts the washer 106 off its seat 104, as indicated in FIGURE 3, to permit gas to escape out through the opening 120 and into the path of the shower of sparks with the result that the desired flame is produced. When the thumbpiece is released spring 41 moves the parts back to the position shown in FIGURE 1. Snuffer 32 engages the valve stem to move the resilient washer 106 into engagement with the seat 104 to cut off the flow of gas to extinguish the flame.

Referring now to FIGURE 5 I have shown an alternate form of my regulatable valve which is normally closed and which opens in response to operation of the thumbpiece. In this form of my invention the valve has a hollow stem 124 provided with a bore 126 to which gas is admitted by opening 128 in the stem. A spring 130 bears between a flange 132 at the top of the actuator 110 and the stem head 134 which carries the pad 106 normally to urge the pad into engagement with the seat 104. I provide this form of my invention with a valve lifter 136 surrounding the actuator 110. A lever 138

adapted to rock on a pivot 140 has a forked end provided with inwardly directed offsets 142 which ride in a groove 144 formed in the lifter 136. I provide a seal 146 between the upper end of the lifter 136 and a collar 148 carried by the valve stem 124.

In operation of the form of my valve shown in FIGURE 5 when the thumbpiece 38 is operated in a manner known to the art lever 138 rocks in a clockwise direction as viewed in FIGURE 5 to move lifter 136 up to move step 124 up to lift the valve off the seat 104 to permit gas to pass into the bore 126 of the stem.

It will be seen that I have accomplished the objects of my invention. I have provided a regulatable valve assembly which will not readily clog. My valve assembly has independent factory and user flame height adjustments. My valve is readily adapted to either normally open or normally closed operation.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of my claims. It is further obvious that various changes may be made in details within the scope of my claims without departing from the spirit of my invention. It is, therefore, to be understood that my invention is not to be limited to the specific details shown and described.

Having thus described my invention, what I claim is:

1. A valve assembly for controlling the flow of fluid from a tank including in combination means providing a first opening normally permitting the passage of fluid therethrough, first adjustable means for regulating the flow of fluid through said opening, means providing a second opening normally permitting the passage of fluid therethrough, second adjustable means for regulating the flow of fluid through said second opening independently of the actuation of said first adjustable means, a shutoff valve and means mounting said opening providing means in spaced relation in series with each other and with said shutoff valve to permit communication between the atmosphere and the interior of said tank.

2. A valve assembly for controlling the flow of fluid from a tank including in combination means providing a first opening normally permiting passage of fluid therethrough, first adjustable means for regulating the flow of fluid through said first opening, means providing a second opening normally permitting the passage of fluid therethrough, second adjustable means for regulating the flow of fluid through said second opening independently of the actuation of said first adjustable means, a normally open valve, means mounting said opening providing means and said valve in series on said tank with said opening providing means in spaced relationship, means normally closing said valve and manually operable means for rendering said valve closing means inoperative.

3. A valve assembly for controlling the flow of fluid from a tank including in combination means providing a first opening normally permitting the passage of fluid therethrough, first adjustable means for regulating the flow of fluid through said first opening, means providing a second opening normally permitting the passage of fluid therethrough, second adjustable means for regulating the flow of fluid through said second opening independently of the actuation of said first adjustable means, a normally closed valve, means connecting said opening providing means and said valve in series to the interior of said tank with said opening providing means in spaced relationship and manually operable means for opening said normally closed valve.

4. In a gas-fueled lighter, a tank for containing a supply of fluid fuel, a casing for said tank, a valve assembly comprising means providing a first opening normally permitting the flow of fluid therethrough, first adjustable means providing a second opening normally permitting the passage of fluid therethrough, means mounting said opening providing means in series to permit the flow of

fluid out of said tank, second adjustable means housed by said casing for regulating the flow of fluid through said first opening and means comprising a member carried by said casing for regulating the flow of fluid through said second opening.

5. A valve assembly for controlling the flow of liquefied gas from a tank including in combination a housing having a base, means mounting said housing in the wall of said tank, means forming a port in said housing base through which fluid is permitted to flow from said tank, a dispersion plate provided with a guide stem, said dispersion plate being disposed in said housing over said base with said stem extending into said port and adjustable means for applying pressure to said plate to control the flow of fluid from said tank around said plate and into said housing.

6. A valve assembly for controlling the flow of liquefied gas from a tank including in combination a housing having a base, means mounting said housing in the wall of said tank, means forming a port in said housing base through which fluid is permitted to flow from said tank, a dispersion plate provided with a guide stem, said dispersion plate being disposed in said housing over said base with said stem extending into said port, adjustable means for applying pressure to said plate to control the flow of fluid from said tank around said plate and into said housing and filtering material disposed between said plate and the base of said housing.

7. A valve assembly for controlling the flow of liquefied gas from a tank including in combination a housing having a base, means mounting said housing in the wall of said tank, means forming a port in said housing base through

which fluid is permitted to flow from said tank, a dispersion plate of relatively rigid material provided with a guide stem, said dispersion plate being disposed in said housing over said base with said stem extending into said port, filtering material disposed between said plate and the base of said housing, a first adjustable element carried by said housing for applying pressure to said plate to control the flow of fluid from said tank through said port and around said plate into said housing, a deformable element formed with an opening through which fluid flowing into said housing past said plate is adapted to pass, a second adjustable element carried by said housing and adapted to be positioned to deform said element to regulate the flow of said fluid through said deformable element opening and a shutoff valve disposed in series with said port and with said deformable element opening.

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