Sept. 30, 1952 A. L. FLAMM 2,612,033

GAS FUELED LIGHTER MECHANISM

Filed Aug. 9, 1949 2 SHEETS—SHEET 1

Fig. 1.

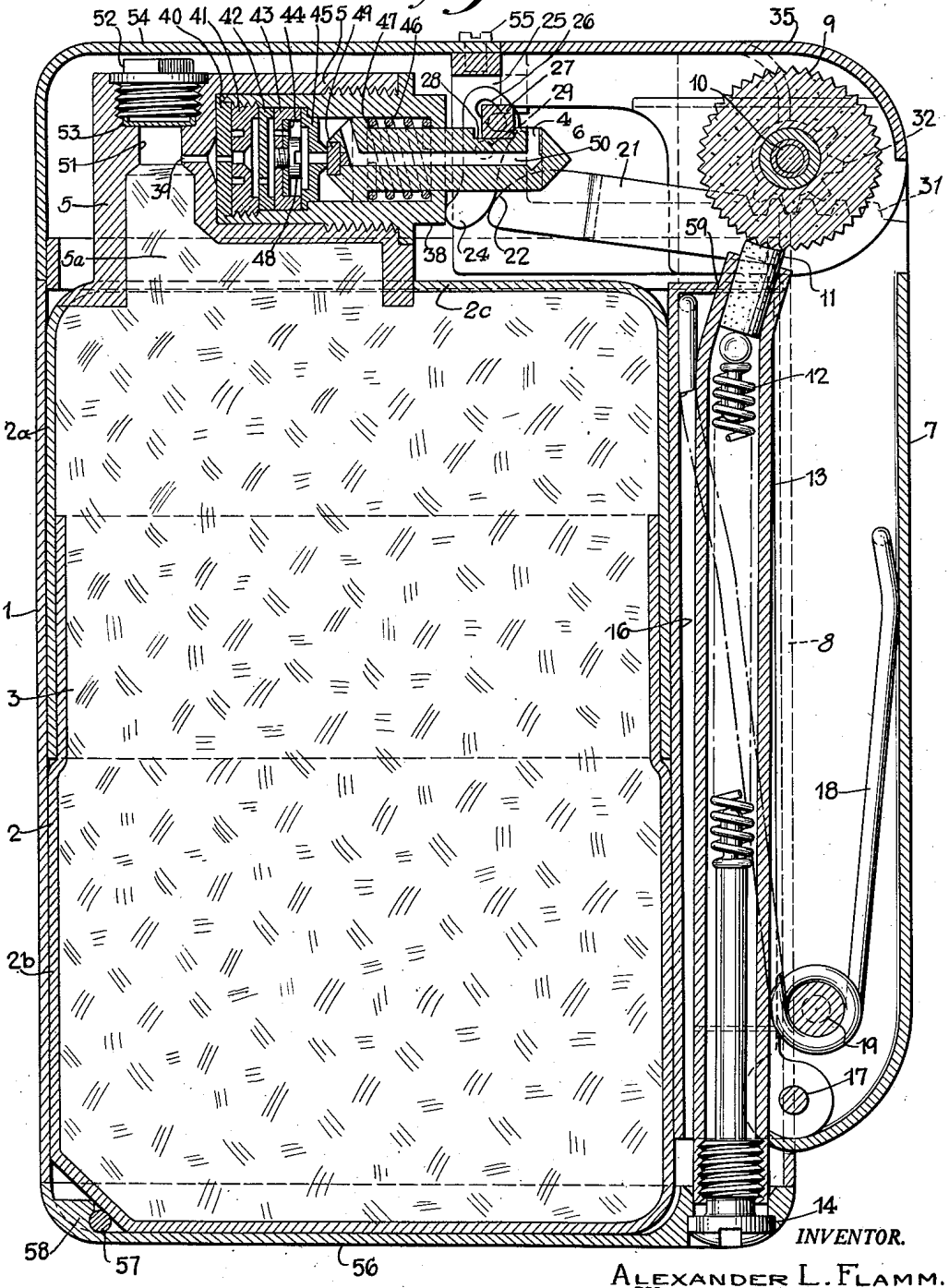

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Fig. 2.

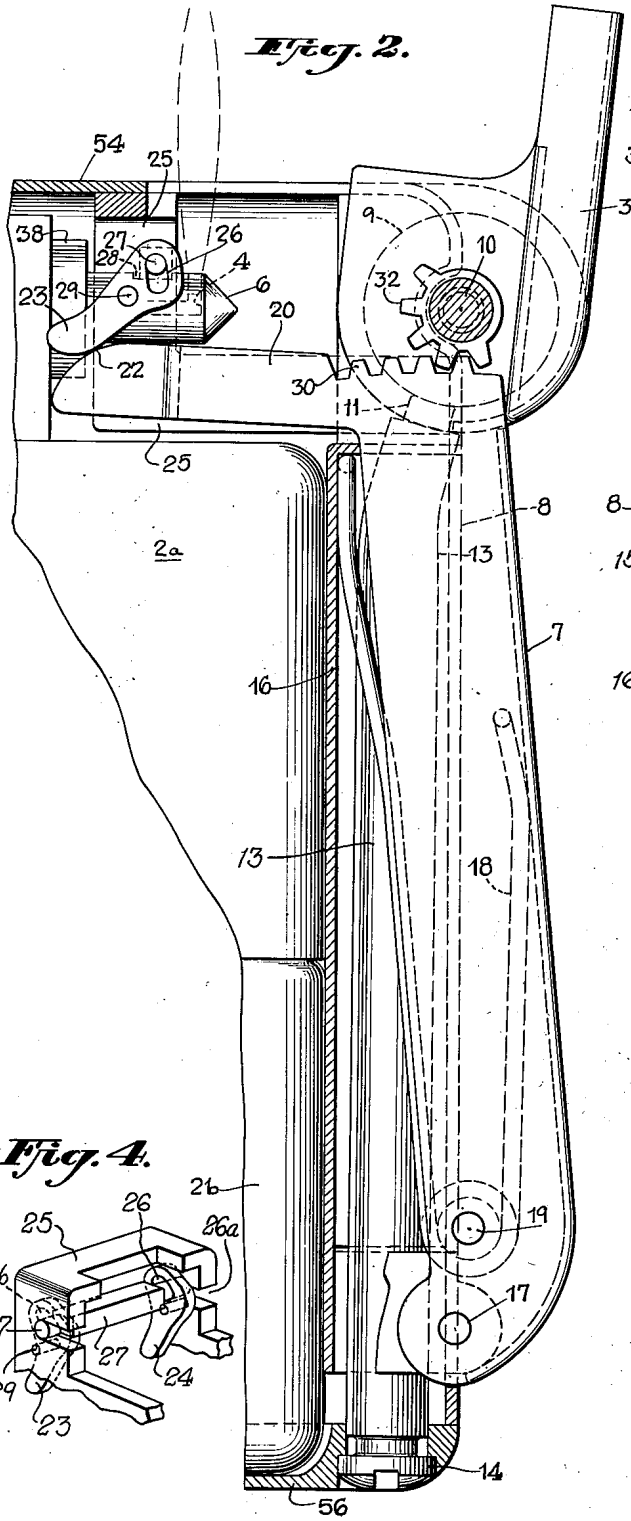

Fig. 3.

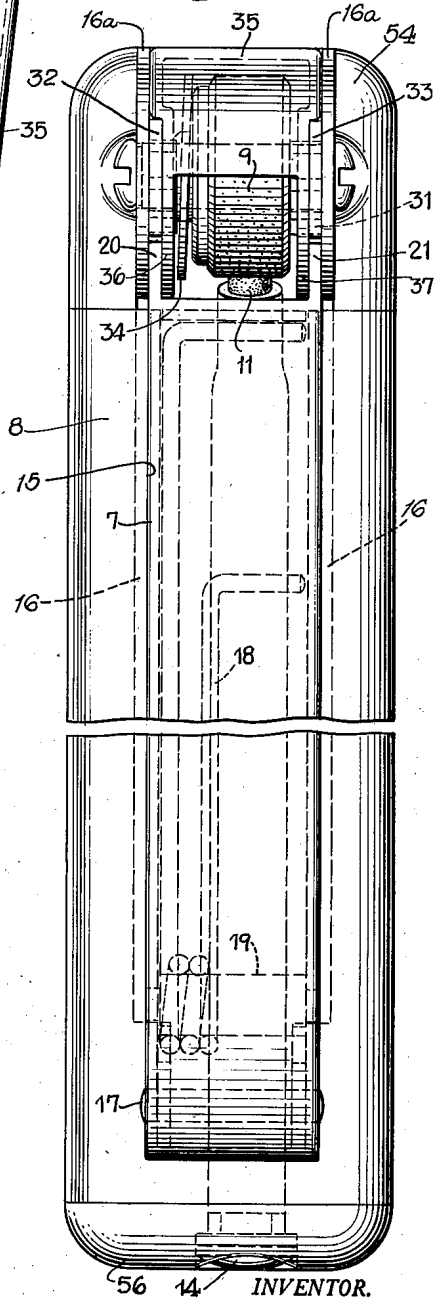

Fig. 4.

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GAS FUELED LIGHTER MECHANISM

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7 Claims. (Cl. 67—7.1)

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The invention relates to cigar lighters of the type wherein gaseous fuel such as butane or propane is used, the flow of gaseous fuel from the fuel container to the burner being controlled by a valve, a pyrophoric fuel igniting mechanism being employed, and a manually operable fingerpiece being provided which is interconnected with the fuel valve and igniting mechanism to actuate them conjointly in timed relation to each other. In one of its aspects the invention aims to promote the facility, convenience and reliability of operation of lighters of the above type, and in another aspect the invention relates to certain features whereby the gaseous fuel container may be readily inserted into and withdrawn from operating position with respect to the lighter actuating mechanism, when a fresh supply of fuel is to be provided. The above and other features of the invention are more specifically referred to in the description hereinafter contained which, taken in conjunction with the accompanying drawings, discloses a preferred form of gas fueled lighter constructed to operate in accordance with the invention; the disclosure however should be considered as merely illustrative of the invention in its broader aspects.

In the drawings—

Fig. 1 is a central vertical section showing one form of lighter constructed to operate in accordance with the invention.

Fig. 2 is a fragmentary side elevation, partly in section, of the lighter shown in Fig. 1, and showing the operating mechanism of the lighter in light producing position.

Fig. 3 is an end elevation of the lighter shown in Figs. 1 and 2.

Fig. 4 is a detail perspective view showing separately, certain parts entering into the lighter actuating mechanism.

The invention is disclosed as applied to a lighter having an outer casing 1, within which is detachably fitted a fuel container 2 shown as made up of telescoping upper and lower sections 2*a* and 2*b*, having a filling 3 of cotton or like fuel absorbent material. The fuel valve is mounted within a housing 5 located above and carried by the upper wall 2*c* of the fuel container, it being understood that the various parts making up the fuel container are secured in gas-tight relation to each other. The gaseous fuel issuing from the container is ignited at the burner opening 4 (Fig. 1) after passing through a valve mechanism, appropriate constructional details for which are more fully described hereinafter. For the present it should be understood that a valve

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plunger 6, having therein a burner passageway 4, is reciprocably mounted in the housing 5 to move between its opened and closed positions, in a substantially horizontal path disposed above and running transversely of the fuel container proper, the valve being closed as the parts appear in Fig. 1 and opened by moving the valve plunger 6 transversely to the right from such position.

The actuating mechanism of the lighter comprises a fingerpiece 7 mounted at the side wall 8 of the lighter casing, and reciprocable between idle and active positions. A sparking wheel 9 is carried by an axle 10 and positioned adjacent the burner opening 4, a flint 11 being pressed against the sparking wheel 9 by a spring 12 contained within a flint tube 13 having an adjusting screw 14 at its bottom.

The fingerpiece is coupled to the valve plunger 6 and to the sparking wheel 9 in such manner that movement of the fingerpiece from idle to active position opens the valve and rotates the sparking wheel to project a stream of sparks into the path of gas issuing from burner opening 4; and as the fingerpiece moves from active to idle position, valve 6 is closed to shut off the supply of fuel and extinguish the flame.

In the illustrated form of the invention the side wall 8 of the outer casing has an opening 15 therethrough (Fig. 3) within which the fingerpiece 7 is mounted to swing about a pivot pin 17. A restoring spring 18, coiled about a pin 19, is preferably provided to urge the fingerpiece 7 toward its idle position shown in Fig. 1. The flint tube 13 may be received in, and its upper end affixed to a frame piece 16 of U-shaped cross section, which is located inside the side wall 8 of the outer casing 1, and affixed to wall 8 adjacent the sidewalls of opening 15 as shown in Fig. 3, the frame piece 16 being also extended upwardly above the sidewall 8 as indicated in Fig. 3, to provide ears 16*a* on the opposite sides of the sparking wheel 9, between which the axle 10 is supported.

The fingerpiece 7 is shown as provided at its upper end portion with a pair of spaced arms 20 and 21 extending inwardly above the fuel container, the inner ends of these arms having cam surfaces as indicated at 22 (Figs. 1 and 2) which respectively engage levers 23 and 24 (Figs. 1 and 2) which are pivotally mounted as indicated at 29 on the opposite sides of an angle shaped frame piece 25 which is preferably fixed to the upper part of frame piece 13. The portion of the frame piece 25 which receives the pivots 29 is in the

nature of an arch within which the valve plunger 6 is located, and to the opposite sides of which the levers 23 and 24 are pivoted.

A valve actuator bar 27 has its opposite ends received in slots 26 in the levers 23 and 24 and also in slots 26a (Fig. 4) in the opposite sidewalls of frame piece 25, and the intermediate portion of the bar engages in a slot 28 in the valve plunger 6. When the fingerpiece 7 is manually pushed inwardly from its idle position shown in Fig. 1, the cam portions 22 on the arms 20 and 21 immediately rock the levers 23 and 24 to push the actuator bar 27 and therefore the valve plunger 6 to the right from the position shown in Fig. 1, the action being to move the valve to fully open position or nearly so, during the initial part of the movement of the fingerpiece, so that during further movement of the fingerpiece from idle position as hereinafter described, the valve plunger 6, being already substantially fully open, is merely held open or moves only slightly. After the fingerpiece 7 has been moved as above described, and when manual pressure thereon is released, the fingerpiece moves back to the idle position shown in Fig. 1 under the action of spring 18, and a spring 46 (Fig. 1) moves the fuel valve 6 back to closed position, and rocks the levers 23, 24 from the position shown in Fig. 2 back to the position shown in Fig. 1.

Movement of the fingerpiece from idle to active position also rotates the sparking wheel 10 to project a stream of sparks into the gas issuing from burner opening 4, during and after the time the fuel valve is opened. For this purpose, in the illustrated form of the invention, the arms 20 and 21 are provided respectively with teeth 30 and 31 (Figs. 2 and 1) which mesh respectively with sector gears 32 and 33 mounted on the axle 10 on opposite sides of the sparking wheel 9, it being understood that an appropriate pawl member 34 (Fig. 3) is provided to engage a ratchet (not shown) on the sparking wheel 9 to rotate the latter when the fingerpiece moves from idle to active position, but allowing the sparking wheel 9 to remain stationary when the fingerpiece moves from active to idle position. This pawl and ratchet mechanism is not shown or described in detail since appropriate forms thereof are known in the art.

Preferably a protective closure member 35 is employed for the space adjacent the burner opening 4, and which is moved to open position by movement of the fingerpiece from idle to active position and vice versa. In the illustrated form of the invention this closure member 35 is provided at its opposite sides with ears 36 and 37 which are fixed respectively to the gears 32 and 33 above mentioned, so that as the fingerpiece 7 moves from idle to active position, the closure member swings about axle 10 into the open position shown in Fig. 2, and moves back to the closed position shown in Fig. 1, when the fingerpiece moves from active to idle position.

The illustrated form of the invention is provided with a top cap member 54 which fits upon the casing 1 and encloses the valve housing 5, this cap being shown as detachably held in position by a screw 55 (Fig. 1) which sets in the frame piece 25. The closure member 35 when closed, forms in conjunction with the cap 54, a substantially complete cover for the parts at the top of the lighter structure.

The casing 1 is also provided with a detachable bottom end plate 56, so that when this is detached, the fuel container and its accompanying valve structure, may be inserted into and withdrawn from operating position with respect to the active parts of the lighter, from the bottom end of casing 1. It will be noted that by vertical movement of the fuel container, the valve plunger 6 is freely engageable with and disconnectible from its actuator bar 27, a mode of operation which is facilitated by the horizontal disposition and path of movement of the valve plunger. As shown, the bottom end plate 56 is removably held in position by the adjusting screw 14 previously mentioned, and also by an internal lug or catch 58 (Fig. 1) which is held against a lug 57 attached to the bottom portion of the fuel container when the parts are in operating position.

The disclosed form of fuel container is provided with a charging opening 51 (Fig. 1) through which fuel of the character described will ordinarily be introduced in liquid form while the closure plug 52 and associated sealing gasket 53 are removed. Then the last mentioned parts are inserted into sealing position whereupon the fuel converts progressively into gaseous form appropriate for delivery through the valve plunger 6 when the valve is open. It should be noted that the valve housing 5 previously described, affords an auxiliary chamber 5a above and addition to the main fuel chamber in the container 2, 2a. This auxiliary chamber is advantageous in that it better insures that the fuel passing through the valve plunger 6 will all be in gaseous form, without entrained liquid fuel. The illustrated form of fuel valve structure includes a passageway 39 in the valve housing 5, which leads to an appropirate gasket 40, from whence the gaseous fuel passes successively through an apertured threaded plug 41, apertured cup members 42, 43 and apertured disk 44, and thence through a further apertured cup member 45, the last mentioned parts being retained in assembled relation by a threaded plug 41 which screws into the threaded shell 38. The threaded shell 38 screws into the valve housing 5, and holds the gasket 40 in position. The reduction of pressure of the fuel in passing through the valve structure may be controlled by positioning the disk 44 with its aperture more or less out of line with the aperture of cup member 43, the adjustment being accomplished by an adjusting screw 48. The inner end of valve plunger 6 is shown as provided with a sealing plug 49 of semi-hard rubber or the like, to effect a tight seal with cup 45 when the fuel valve is closed. A spring 46 urges the valve plunger 6 towards closed position, and when the valve is moved to open position as above described, the fuel flows through a duct 50 in plunger 6 to the burner opening 4 previously described, which is directed angularly upward with respect to the path of movement of the fuel valve.

With the above type of lighter construction, the fuel valve is drawn toward and from the fingerpiece in the opening and closing strokes, and during the same movements the actuation of the sparking wheel and closure member is accomplished intermediately, so to speak, in the space between the fingerpiece and fuel valve. When the fuel container is to be removed or a fresh container substituted, the fuel valve actuator bar readily engages into and disengages from its operating position with respect to the valve plunger.

While the invention has been disclosed as carried out by a lighter of the above described specific construction, it should be understood

that changes may be made without departing from the invention in its broader aspects, within the scope of the appended claims.

I claim:

1. A gas fueled lighter of the character described having an outer supporting casing, a gaseous fuel container detachably received within said casing, said fuel container having an upper wall carrying a fuel valve housing, a burner carrying valve reciprocably mounted in said housing to move between open and closed positions in a substantially horizontal path disposed above and running transversely of the fuel container proper, a sparking wheel carried by said casing adjacent said burner valve, a fingerpiece mounted on said casing to move between idle and active positions and drivingly connected to said sparking wheel, whereby said sparking wheel is rotated by said finger piece upon the movement thereof from idle to active positions, and mechanism interconnecting said fingerpiece with said valve to move said valve to open position as said fingerpiece moves from idle to active position.

2. A gas fueled lighter of the character described having an outer supporting casing, a gaseous fuel container detachably received within said casing, said fuel container having an upper wall carrying a fuel valve housing, a burner carrying valve reciprocably mounted in said housing to move between open and closed positions in a substantially horizontal path disposed above and running transversely of the fuel container proper, a closure member also mounted on said casing, to move between positions respectively closing and exposing the space adjacent said burner, a fingerpiece mounted on said casing to move between idle and active positions and drivingly connected to said sparking wheel and to said closure member, whereby said sparking wheel is rotated and said closure member is moved to burner exposing position by said fingerpiece upon movement thereof from idle to active positions, and mechanism interconnecting said fingerpiece with said valve to move said valve to open position as said fingerpiece moves from idle to active position.

3. A gas fueled lighter of the character described having an outer supporting casing, a gaseous fuel container detachably received within said casing, said fuel container having an upper wall carrying a fuel valve housing, a burner valve reciprocably mounted in said housing to move between open and closed positions in a substantially horizontal path disposed above and running transversely of the fuel container proper, a sparking wheel carried by said casing adjacent said burner valve, a fingerpiece mounted in the side wall of said casing to move between an idle outer position and an active inner position, a cam actuated link mechanism also carried by said casing and interposed between said fingerpiece and valve to open the latter as said fingerpiece moves from idle to active position, and mechanism also connecting said fingerpiece to said sparking wheel to rotate the latter as said fingerpiece moves from idle to active position.

4. A gas fueled lighter of the character described having an outer supporting casing, a gaseous fuel container detachably received within said casing, said fuel container having an upper wall carrying a fuel valve housing, a burner valve reciprocably mounted in said

housing to move between open and closed positions in a substantially horizontal path disposed above and running transversely of the fuel container proper, a sparking wheel carried by said casing adjacent said burner valve, a fingerpiece mounted in the side wall of said casing to move between an idle outer position and an active inner position, a cam actuated link mechanism also carried by said casing and interposed between said fingerpiece and valve to open the latter as said fingerpiece moves from idle to active position, and mechanism also connecting said fingerpiece to said sparking wheel to rotate the latter as said fingerpiece moves from idle to active position, said cam actuated mechanism being detachable from and engageable with said valve by vertical movement of said fuel container with respect to said casing.

5. A gas fueled lighter of the character described having an outer supporting casing, a gaseous fuel container detachably received within said casing, said fuel container having an upper wall carrying a fuel valve housing, a burner carrying valve reciprocably mounted in said housing to move between open and closed positions in a substantially horizontal path disposed above and running transversely of the fuel container proper, a sparking wheel carried by said casing adjacent said burner valve, an actuator bar reciprocably mounted in said casing to move in a substantially horizontal path adjacent said valve, and detachably engaging said valve, a fingerpiece mounted at one side of said casing to move between an idle outer position and an active inner position, a cam actuated mechanism interposed between said actuator bar and said fingerpiece to move said bar to open said valve when said fingerpiece moves from idle to active position, and mechanism connecting said fingerpiece with said sparking wheel to rotate said sparking wheel as said fingerpiece moves from idle to active position.

6. A gas fueled lighter of the character described having a supporting casing structure and a chamber therein containing gaseous fuel under pressure, said casing structure having an upper wall carrying the fuel valve housing, a burner carrying valve reciprocably mounted in said housing to move between open and closed positions in a substantially horizontal path disposed above said wall and running transversely of the casing structure, a fingerpiece reciprocably mounted at one side of the casing structure to move toward and from said valve, between idle and active positions respectively, a sparking wheel carried by the casing structure adjacent said burner valve and intermediate said valve and said fingerpiece, and mechanism drivingly interconnecting said fingerpiece with said sparking wheel to rotate said sparking wheel and interconnecting said fingerpiece and said valve to move said valve to open position as said fingerpiece moves toward said valve from idle toward active positions.

7. A gas fueled lighter of the character described having a supporting casing structure and a chamber therein containing gaseous fuel under pressure, said casing structure having an upper wall carrying the fuel valve housing, a burner carrying valve reciprocably mounted in said housing to move between open and closed positions in a substantially horizontal path disposed above said wall and running transversely of the casing structure, a fingerpiece reciprocably mounted at one side of the casing structure to

move toward and from said valve in a vertical plane substantially parallel to said path, between idle and active positions respectively, a sparking wheel carried by said casing structure adjacent said burner valve and intermediate said valve and said fingerpiece, said casing structure also having a closure member overlying said valve, mechanism drivingly interconnecting said fingerpiece with said closure member and said sparking wheel to rotate said sparking wheel and to open said closure member as said fingerpiece moves toward said valve from idle toward active position, and mechanism interconnecting said fingerpiece with said valve to move said valve to open position as said fingerpiece moves toward said valve.

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