

Feb. 8, 1955

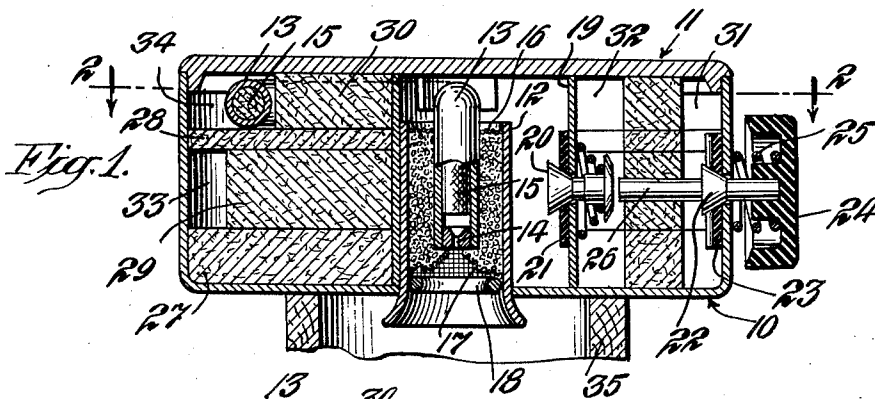
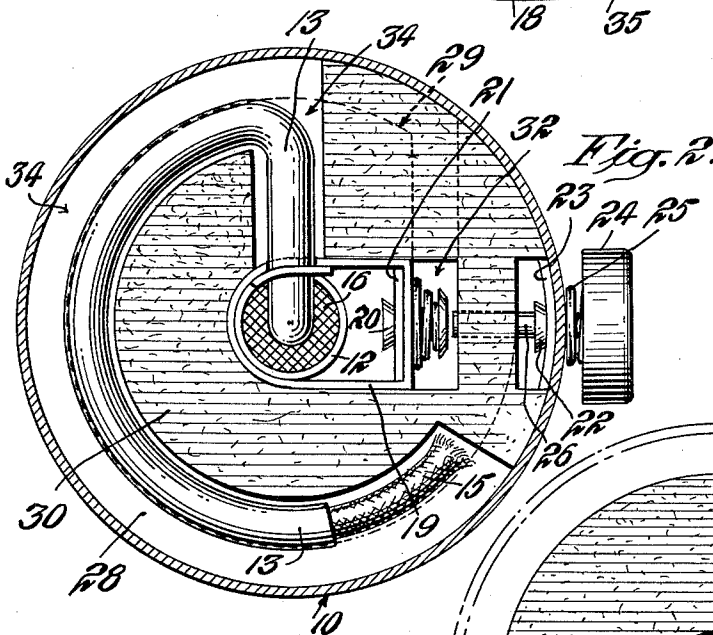
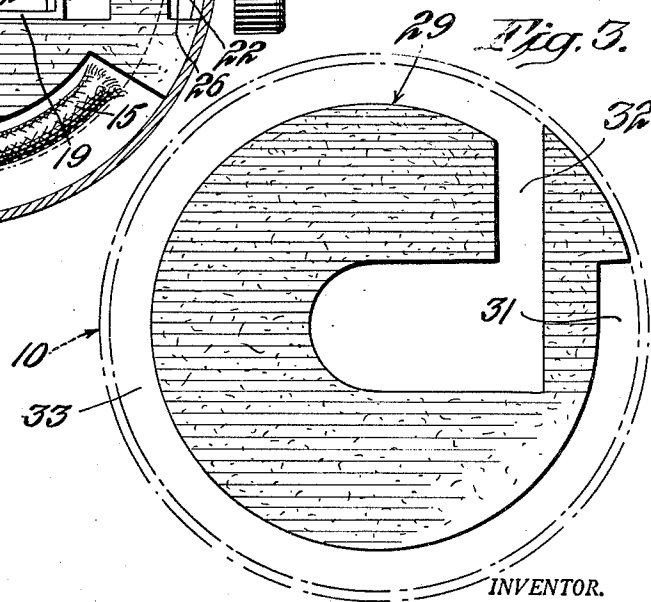
E. T. WILLIAMS

2,701,459

LIGHTER

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2 Sheets-Sheet 1



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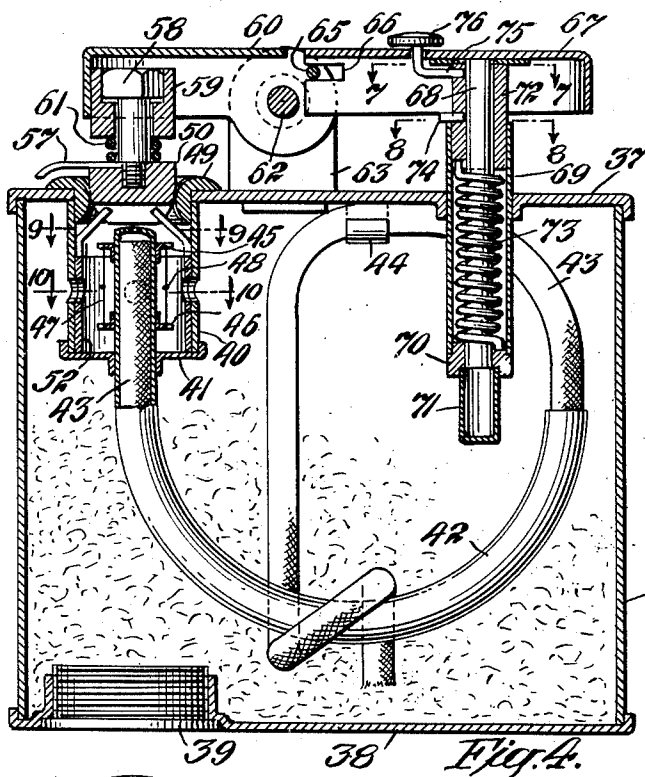
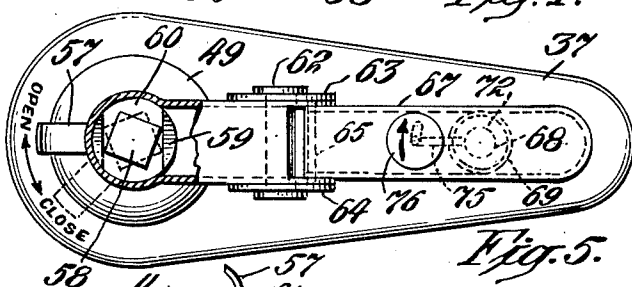
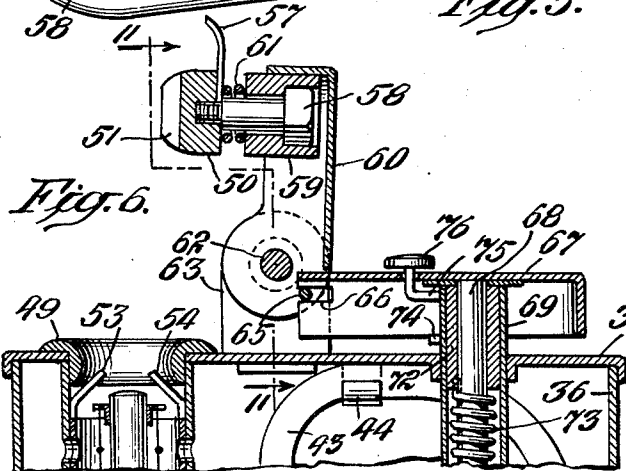
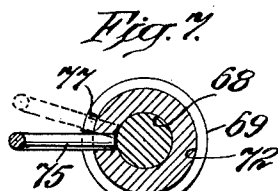
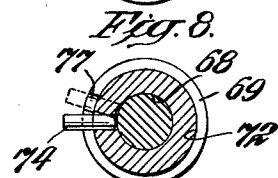
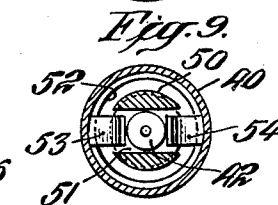
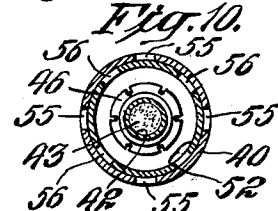
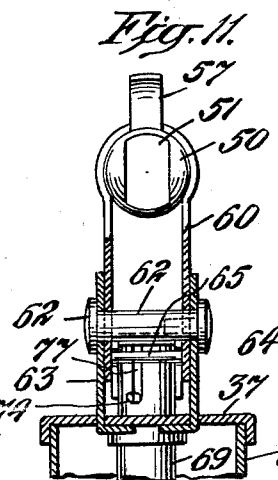
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LIGHTER

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2 Sheets-Sheet 2



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LIGHTER

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10 Claims. (Cl. 67—7.1)

My invention relates to a lighter, particularly for cigarettes, cigars, and pipes, and it is the object to light equally well all three under any and all conditions.

The objective is attained by presenting a mixture of air with alcohol or the like to a suitable catalyst such as platinum, and applying the resulting heat to create a jet of vapor and ignite it.

The invention is described in greater particularity with reference to the accompanying drawings of which:

Fig. 1 is a center section of a lighter embodying the invention;

Fig. 2 is a section on line 2—2 in Fig. 1;

Fig. 3 is a plan of a filler piece in the lighter of Fig. 1;

Fig. 4 is a center section of another form of lighter embodying the invention;

Fig. 5 is a plan of the lighter in Fig. 4, broken away in part;

Fig. 6 is a partial view like Fig. 4 with parts in operated positions;

Figs. 7, 8, 9 and 10 are detail sections on the correspondingly numbered lines in Fig. 4; and

Fig. 11 is a detail section on line 11—11 in Fig. 6.

Referring first to the embodiment illustrated in Figs. 1, 2 and 3, the lighter casing is formed by a shallow round cup 10 provided with a circular cover plate 11. In the center of the cup 10 there is a tube 12 which projects through a hole in the center of the bottom of the cup. The projecting end of the tube 12 is flared outward to receive the end of a cigarette or cigar having a tapered end. A small metal tube 13 has one end projecting into the tube 12. This end of the tube 13 is closed and provided with a minute orifice 14. A wick 15 is located in the small tube 13 and one end of the wick projects from the other end of the tube, as best seen in Fig. 2. The tube 13 is looped in the interior of the lighter casing. Two screens 16 and 17 hold a quantity of sponge platinum pieces in the center tube 12 around the end of the small jet tube 13. The screen 17 is held by a spring ring 18 and is cone shaped with a central opening in line with the jet orifice 14.

Surrounding the center tube 12 there is a housing 19 which, with the exterior casing, segregates the center tube 12 from the remaining interior parts of the lighter casing. The center housing 19 is provided with a normally closed check valve 20 which is seated on a suitable valve plate 21.

The exterior casing is provided with a normally closed valve 22 which seats on a valve plate 23. The valve 22 can be opened at will by pressing on a push button 24 under which is located a spring 25 which holds the valve in its normal closed position. A short stem 26 carried by the valve 22 projects toward the check valve 20 so that when the valve 22 is opened by pressing on the button 24 the stem 26 contacts and opens the valve 20.

Inside the lighter casing are a number of felt pads. Between two of these pads 27 and 28 there is located a third pad 29. Above the pad 28 there is located a fourth pad 30. These pads occupy the interior of the lighter casing outside the housing 19, but are formed to leave an open space 31 around the valve 22 and another open space 32 around the valve 20. The valve operating stem 26 projects through a hole in the pad 29. This pad is formed to provide a peripheral passage 33 that connects the two valve spaces 31 and 32. The outline of pad 29, shown in Fig. 3, is dotted in Fig. 2. The top pad 30 is formed to provide a recess 34 for the jet tube 18. This recess may be filled with loose absorbent material. The pads and any loose absorbent in the lighter casing are to be kept impregnated with alcohol. A small filling plug, not shown, is provided in the cover plate 11.

In Fig. 1 the lighter is shown resting on the top edge

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of a smoking pipe 35. The user depresses the button 24 and draws on the pipe that is to be lighted. The valves 20 and 22 being open, air flows past valve 22 and thence through the peripheral passage 33 around the outside of the pad 29 and into the center housing 19 past the valve 20. Alcohol evaporates and diffuses into the air stream and the resulting mixture continues from the interior of the housing 19 through the center tube 12. When the gaseous mixture contacts the catalyst 16 the latter incandesces and heats the jet tube 13. The wick 15 has transported alcohol by capillarity into this end of the jet tube and the alcohol is vaporized by the heat of the catalyst 16. The vapor has trouble getting out past the wetted wick 15, so its pressure rises and it issues through the orifice 14 in the form of a fine jet. This vapor jet is ignited by the incandescent catalyst 16 and the lighted jet projects downward into the pipe for igniting the tobacco therein. The end of a cigarette or the tapered end of a cigar to be lighted can be inserted into the flared end of the center tube 12. A flat end cigar can be placed against the flared end of the center tube.

Referring now to the embodiment illustrated in Figs. 4 to 11 inclusive, the lighter casing is formed by a shell 36 closed at one end by a top plate 37, and closed at the other end by a bottom plate 38. A screw plug 39 for filling is provided in the bottom plate 38.

A well is formed in the top plate 37 by a cylinder 40 having its upper end secured around an opening in the top plate, and its lower end closed by a cap 41. A small tube 42, like the jet tube 13 in Fig. 1, has its orifice end projecting through the cap 41 into the well formed by the cylinder 40. The other end of the jet tube 42 is curled upward within the casing, and the wick 43 continues under a clip 44 on the under side of the plate 37, and thence downward, its end being suitably secured as by tying to the lowermost part of the jet tube 42.

The orifice end of the jet tube 42 is fitted with two small flanges 45 and 46 slotted inward radially. A platinum filament 47 is strung between the flanges 45 and 46. A button 48 of platinum black or sponge platinum is formed on each length of the filament 47 in known manner.

The top of the lighter well is fitted with an annular ledge of generally circular inner surface to provide a seat 49 for a closure member or stopper 50. The bottom of the stopper 50 is a hemisphere traversed by a groove 51. In Fig. 4 the stopper 50 is seated in the ring 49 to seal the top of the well. A sleeve 52 is journaled within the well cylinder 40 and has two prongs 53 and 54, see Figs. 6 and 9, which project upward and inward so that the upper ends of the prongs lie within the slot 51 in the stopper 50. Turning the stopper 50 thus causes the sleeve 52 to turn. The well cylinder 40 and the sleeve 52 have a number of openings which register when the stopper 50 is in its normal position as shown in Fig. 4. When the stopper and sleeve are turned, the holes 55 in the well cylinder 40 are closed, as seen in Fig. 10, the holes 56 in the sleeve 52 having been revolved out of register. The stopper 50 is turned by means of a combination pointer and lever 57.

The stopper 50 is mounted by a short bolt 58 in a bushing 59 which is secured in a lever 60. The head of the bolt 58 is recessed in a slot 60 which limits turning movement of the bolt and stopper. The bolt 58 has a loose fit in the bushing 59, and a short spring 61 tensions the stopper with respect to the bushing.

The lever 60 is pivoted on a pin 62 in a pair of brackets 63 and 64 on the top plate 37. A second pin 65 in the lever 60 engages in slots 66 in the end of a press bar 67. The latter is mounted on the upper end of a rod or plunger 68 which projects downward into a spring well in the top plate 37. The spring well is formed by a tube 69, a reducing fitting 70, and a smaller tube 71 closed at its lower end. A sleeve 72 is journaled on the upper end of the rod 68 and fits slidably in the tube 69. A coil spring 73 is located in the tube 69. The upper end of the spring engages in a notch in the bottom edge of the sleeve 72. The lower end of the spring engages in a notch in the fitting 70.

The sleeve 72 is provided with a short pin 74 projecting above the top edge of the plunger well tube 69. The

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sleeve 72 also has a longer pin 75 directly above the pin 74 and projecting upward through a short slot in the top of the press bar 67. The projecting end of the pin 75 is fitted with a button 76. A straight slot 77 running downward from the upper edge of the tube 69 (Figs. 7, 8 and 11) is just wide enough to admit the pins 74 and 75 when they are rotated by means of the button 76 to a position in which they register with the slot, as indicated in dotted outline in Figs. 7 and 8.

The lighter casing is packed with a suitable absorbent material, such as fiber glass or rock wool, by way of the filling plug 39. This packing is kept impregnated with a suitable liquid fuel, such as methyl alcohol. The wick 43 in the jet tube may be of fiber glass or fine metallic wire mesh. The wick 43 is kept wet with liquid from the packing.

The well formed in the top plate 37 by the cylinder 40 is normally closed by the stopper 50 seated in the ring 49, and the well has an alcohol vapor atmosphere when the holes 55 are open. In Fig. 10 the holes 55 are shown closed by the sleeve 52, but normally the sleeve 52, operated by the pointer 57, is turned so that the holes 56 register with the holes 55 as shown in Fig. 4 where the holes are seen but not indicated by reference characters.

The lighter is operated by raising the stopper 50. This is done by pressing the bar 67. The latter is prevented from moving accidentally by the pin 74 projecting over the top edge of the tube 69. By moving the button 76 in the direction indicated by the arrow on this button in Fig. 5, the sleeve 72 and the pin 74 are turned against the action of the spring 73 so that the pin registers with the slot 77 permitting the bar 67 to be depressed, also against the action of the spring 73. Depressing the bar 67 causes the lever 69 to be rotated because of the pin 65 and slot 66 association of the lever 69 with the press bar 67. Rotation of the lever 69 carries the stopper 50 upward and out of the way of the top of the liquid well. Air enters the well when the stopper 50 is lifted and permits catalytic combustion of the vapor in known manner around the end of the jet tube 42. The resulting heat vaporizes liquid in the wick 43. This vapor is confined so that its pressure increases and it issues through the small hole in the end of the jet tube in the form of a fine jet. The vapor jet ignites from the heat of the catalytic combustion and is available for lighting a cigarette or cigar or pipe, or anything else for that matter. The lighter can be turned in any direction and the jet, due to its velocity, extends in the direction the lighter is turned. Thus it is that this lighter can be turned upside down for lighting, by way of example, a pipe. When the lighter is turned upside down, the jet projects downward. Because of the force of the jet, wind has little effect on it. Wind abets rather than interferes with the operation of this lighter, because when the stopper 50 is lifted the supply of air into the well is more rapid if the air is in motion.

When the press bar 67 is released, the spring 73 forces it back in place to close the stopper 50. This cuts off air to the well and snuffs out the jet flame. The stopper 50 is held tightly closed by the action of the spring 73 on the press bar 67. When the latter returns to its normal position, the button 76 and the pin 74 are turned by the spring 73 back to the position in which the operator cannot be accidentally operated. The stopper 50 is mounted so that it can fit nicely in the ring 49. The mounting bolt 58 has a loose fit in the bushing 59, the relationship between the stopper 50 and the bushing 59 being tensioned by the spring 61.

If for any reason it is desired to open the stopper 50 without operation of the lighter, the pointer 57 is first turned to the position marked "close" in Fig. 5. This revolves the stopper 50 and the sleeve 52 so that the holes 56 and 55 are moved out of register as shown in Fig. 10.

Various changes may be made within the scope of the invention as set forth in the following claims.

I claim:

1. A lighter comprising a vapor jet device supplied with volatile liquid fuel, a catalytic heater arranged to vaporize the liquid in said jet device and ignite the vapor issuing from said jet device, and means exclusive of said jet device to supply combustible vapor to said heater.

2. A lighter comprising a tube closed at one end except for a small aperture, capillary material in said tube adapted to hold a volatile liquid fuel, catalytic material so

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arranged adjacent the aperture end of said tube as to be in heat transfer relation therewith, and means exclusive of said tube for applying at will to the catalyst a mixture combustible in contact therewith and thereby produce heat to vaporize liquid in said tube and ignite vapor issuing from said aperture.

3. A lighter comprising a device adapted to contain a volatile liquid fuel and emit a jet of combustible vapor upon heating of the liquid, and means to heat the liquid and ignite the jet consisting of a catalyst and means exclusive of the jet for applying at will to the catalyst air and vapor combustible in contact with the catalyst.

4. A lighter comprising a container for volatile liquid, a device associated with said container also adapted to hold volatile liquid fuel and emit a jet of combustible vapor upon heating of the liquid therein, a catalyst arranged to heat liquid in said device and ignite the vapor jet emitted thereby, and means exclusive of the jet and operable at will to bring air and vapor of liquid in said container into contact with said catalyst, the vapor and the catalyst being such as to cause combustion on the catalyst to produce the heat for vaporizing liquid in said device and igniting the jet.

5. A lighter comprising a device adapted to contain a volatile liquid fuel and operable to emit a jet of combustible vapor upon heating of the liquid, a casing associated with said device and also adapted to contain a volatile liquid, a catalyst so arranged as to heat liquid in said device and ignite the jet therefrom upon heating of the catalyst, means excluding the jet but forming a path of flow for air first in contact with liquid in said container and then in contact with said catalyst, and means to open and close said path of flow, the catalyst and liquid in said container being such that vapor of the liquid burns in the presence of air and the catalyst.

6. A lighter as set forth in claim 5 in which said vapor jet emitting device is a tube closed at one end except for a small aperture, said tube containing capillary material and located in said casing with its apertured end adjacent an opening in the casing.

7. A jet lighter comprising a casing adapted to contain a volatile liquid fuel, means forming a chamber within said casing communicating both with the exterior and interior thereof independently of the jet device infra, means for opening and closing communication of said chamber with the exterior and/or interior, a device adapted to contain a volatile liquid and operable to emit a jet of combustible vapor upon heating of this liquid, said device being located in said chamber, and a catalyst within said member so arranged as to heat liquid in said device and ignite the jet therefrom, the catalyst and the liquid in said container being such that vapor of the liquid burns on the catalyst when said chamber is open to the exterior and interior of the container.

8. A lighter as set forth in claim 7 in which said device is a tube containing capillary material and closed at one end except for a small aperture, the aperture end of the tube being located in said chamber and the other end of the tube projecting through the chamber wall into said casing, with the capillary material projecting from said other end of the tube sufficiently to pick up liquid within the casing.

9. A lighter as set forth in claim 7 in which said means for opening and closing communication of the chamber with the exterior and/or interior of the casing is such that communication with the interior can be closed prior to opening of communication with the exterior.

10. A lighter as set forth in claim 7 in which said means for opening and closing communication of said chamber is provided with a safety so that the means is inoperative to open communication of said chamber with the exterior until operation of the safety.

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