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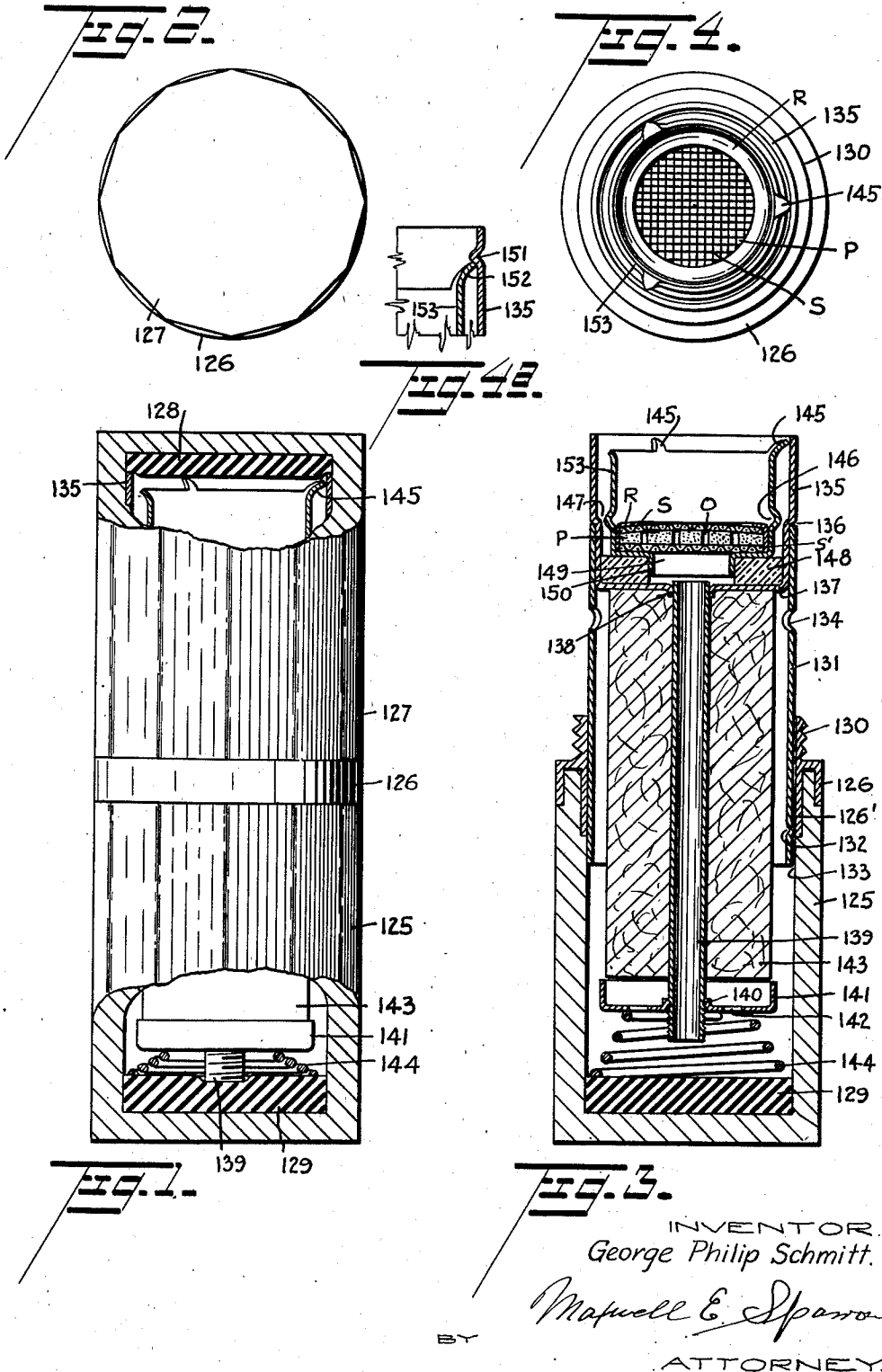
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2,189,999

LIGHTER

Filed Feb. 5, 1936

2 Sheets-Sheet 1



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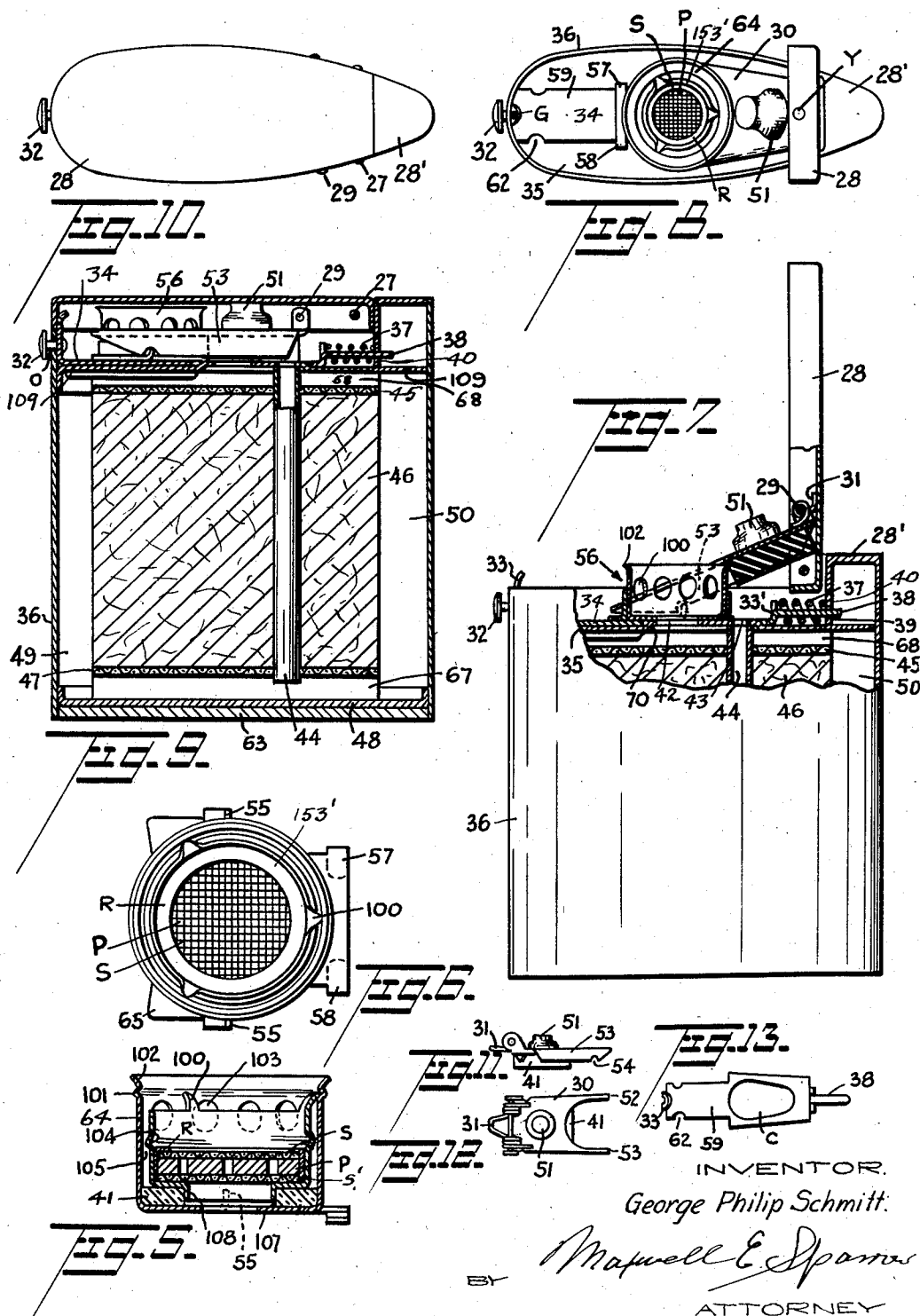
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UNITED STATES PATENT OFFICE

2,189,999

LIGHTER

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Application February 5, 1936, Serial No. 62,391

7 Claims. (Cl. 67-7)

This invention relates to lighters which employ a catalyst for igniting cigarettes and the like, wherein the vapor of alcohol or other vaporizable liquid carried by absorbent material is employed for effecting such action upon the catalyst, in the presence of atmospheric air, as will render such catalyst incandescent, so that the cigarette or the like applied thereto and drawn upon, may be ignited.

The improvements herein contemplated include among others provision of a practical, efficient and economical lighter for cigarettes and the like, wherein a catalyst employed as the igniting element is retained in a holder located above a chamber for containing fuel vapor for coaction with the catalyst, the holder being designed, constructed and arranged in the lighter such that the heat, resulting from the activity of the catalyst when the lighter is in operation, is retained within the holder, at or within the vicinity of the catalyst, and transference of the heat from the holder and catalyst to other parts of the lighter is substantially prevented thereby keeping said parts cool. Further improvements reside in making the chamber below the catalyst air tight to enable the fuel vapor to be efficiently drawn up for coaction with the catalyst when the cigarette is drawn upon, and to also prevent condensation forming on the catalyst; and constructing the holder such that the tip of the cigarette while applied to the incandescent catalyst is free from contact with the holder, conduction of heat from the ignited tip to the holder being thereby prevented.

Other features and advantages of my invention will hereinafter appear.

In the drawings:

Fig. 1 is a side elevational view, partly in section and Fig. 2 a top plan view of a lighter incorporating the invention, the same being shown in closed or inoperative position.

Fig. 3 is a longitudinal sectional view and Fig. 4 a top plan view of the lighter shown in Fig. 1.

Fig. 4a is a fragmentary sectional view of the top of a lighter embodying the invention in a slightly modified form.

Fig. 5 is a sectional view and Fig. 6 a top plan view of the catalyst and holder employed in the lighter indicated in Figs. 7 and 9.

Fig. 7 is a side elevational view, partly in section, and Fig. 8 a top plan view of a further embodiment of the invention.

Fig. 9 is a vertical sectional view and Fig. 10 a top view of the same.

Figs. 11 and 12 are respectively, top plan and side elevational views of the pusher arm.

Fig. 13 is a top plan view of the slideway.

Referring to the embodiment shown in Figs. 1-4a, housing or casing 12 may be of any desirable shape and may be made of any suitable material, composition or metal. Annular sleeve 126 has an inner flange 126' and a threaded portion 130 for threaded engagement with the cover 127. A resilient gasket 129 in housing 125 and another gasket 128 in cover 127 serve as closure means as later explained. Sleeve 131 projects into housing 125 and is provided with a small projection 132 which functions as a friction member against inner flange 126' thereby keeping the same rather tight fitting. Any possible play 133 will be on this side. The sleeve 131 slidably received in casing 125 is provided with vent holes 134 to admit air for admixture with the fuel vapor.

The catalyst shell 135 rests with a shoulder 136 against the top of the sleeve 131. Bottom 137 of shell 135 is provided with a flanged opening 138 into which the axially extended tubular member 139 is fixedly secured. A threaded flanged opening 140 in member 141 (spaced from gasket 129) threadedly engages the opposite end of tube 139. Openings 142 in member 141 provide for circulation of the vapor. Tube 139 is surrounded by the cylindrical contoured fuel charged absorbent mass or wick 143, which is of a smaller outside diameter than the inside diameter of sleeve 131, thereby providing a space all around the wick. The wick extends from bottom 137 of shell 135 to member 141. A compression or helical spring 144 centered on gasket 129 engages member 141 to thereby support elements 135, 139, 141 and 143 in the extended position thereof indicated in Fig. 3.

The catalyst cup or holder 153 is provided at its top with a plurality of tongues or lugs 145, preferably tapered. The function of the lugs is to reduce to a minimum the points of contact and thereby heat conduction between holder 153 and other parts of the lighter. Recess 146 is formed in the lower part of holder 153 to prevent the glowing top of the cigarette from touching the holder as the cigarette is being drawn upon for lighting the same. The heat at the cigarette tip is prevented from being transferred to the holder. The lighter will thus function with heat absorption by its metallic parts at a minimum. Recess 146 is designed so that its wall will be free from shell 135 when inserted therein as indicated at 147.

Holder 153 rests against a heat resisting gasket

148, such as asbestos or composition, into the opening 149 of which is press fitted throat portion 150 of the holder, constituting a leaktight joint that will prevent the passage of fuel other than through said throat.

Fig. 3 shows holder 153 held in place by mere pressure of lugs 145 against the inner wall of shell 135. Fig. 4a shows a modification in that shell 135 is provided with an internal bead 151, against which tongues 152 are forced. An external bead forming a channel into which the tip of the lug may rest, may be employed, such as indicated by numeral 101 in Fig. 5.

Seated on the bottom of holder 143 is a wire screen or perforated disk S' preferably of approximately 100 mesh and made preferably of an alloy of nickel and copper, such as, for example, what is generally known in the trade as "Monel" metal. Above this screen is located the catalyst which is here shown as being in the form of a pellet, block or disk P and which may be composed of a suitably spongy platinum composition or the like. The catalyst may be provided with a plurality of perforations O. Above catalyst P is located a protective front covering or shield S for the catalyst, which may be in direct contact with the latter. Covering S is a perforated disk or plate or wire screen preferably of approximately 70 mesh and made preferably of an alloy of nickel and chromium which may be in the proportion of about 80% nickel and 20% chromium and which may be of the type known under the trade-mark "Nichrome". Covering S and catalyst P are held in place by means of a retainer ring R preferably made of the metal alloy known as "Monel" or the like. For this purpose the retainer R which is cup shaped is inverted and its annular wall press fitted between the side walls of the catalyst and holder. Retainer R has an opening to permit contact of a cigarette with screen S for lighting purposes.

As clearly illustrated in Fig. 1, cover 127 having the inside gasket 128 is employed to force outer cup 135, sleeve 131 and associated elements inwardly until tube 139 presses against gasket 129 under tension of spring 144 to close the passage through the tube. By turning cover 127 relative to housing 125, their complementary threads engage each other and the lighter is kept inoperative, the gasket 129 effecting a leaktight closure for the fuel and air supply tube. Upon removing cover 127, tube 139 is made to disengage from gasket 129 by the action of spring 144. Upon applying a cigarette to the catalyst and being drawn upon, air is drawn in through vents 134 and commingles with the fuel vapor in casing or housing 125, the mixture passing through tube 139 and opening 149 for coaction with catalyst P. For filling purposes housing 125 is pulled away from sleeve 131, and wick 143 saturated with the fuel. The sleeve 131 with attached outer cup 135 and the elements associated with cup 135 constitute a sliding means for supporting or arranging the catalyst in the path of fuel charged air from the casing.

In the form of the invention disclosed in Figs. 5-13, the numeral 26 indicates the wall of a fuel chamber or casing which may be of stream-lined or other suitable shape in cross-section, and adapted to contain a vaporizable fuel vehicle. The lighter has a cap or cover 28 hinged to wall 36 at 27 which together with the member 22' completes the closure means. A top plate 35 forming the upper wall of the casing or container has a fuel opening 42 and an air duct or vent 43.

Extending from vent 43 to near the bottom 48 of the casing is a tube or passageway 44. Within the casing is a wick 46 which acts as an absorbent for the fuel which may be alcohol fed into the casing through opening 42. Upon the top plate 35 a combined catch plate and slideway 34 is superimposed, one end of which has an upright member 33 carrying a stud or release button 32 extending through an opening O in wall 36 and the other end of which has another upright member 33' engaging an expansion spring 37. Spring 37 is arranged so that normally the button 32 protrudes through opening O in the position shown in Figure 1 but so that by pressing the button 32 inwardly against the force of spring 37 an opening G in the raised end 33 of plate 35 may be caused to release or engage a stud or pin Y on the cap or cover 28. The slideway 34 has a cutaway part in its centre forming an opening C so that in any position it does not obscure the opening 42 or 43. Expansion spring 37 is located around an extension arm 38 of slideway 34, which arm passes through an opening 39 in the upright portion 40 of the fixed cover portion 35. Top plate 35 has the extension 109 providing a leaktight compartment below said plate.

Referring to the catalyst unit indicated generally in Fig. 7 by the numeral 56, and shown in detail in Figs. 5-6, the catalyst cup or holder 153' is provided at its top with a plurality of tongues or lugs 100, and a recess 104 is formed in the lower part of holder 153', similar to and for the same purposes as lugs 145 and recess 146 (Figs. 1-4a). The bulged wall of recess 104 is free from chamber 64 as indicated at 105. Holder 153' may be held in place by engagement of lugs 100 with the wall of channel 101 or by any other suitable manner. Holder 153' with its throat 108, gasket 41 with its opening 107, screens or perforated disks S, S', retainer ring R, catalyst P and their respective dispositions are similar to the corresponding parts which have been described hereinabove with relation to Figs. 1-4a. Chamber 64 may be provided with the bevelled edge 102 extending from channel 101; and also the vents or openings 103 for circulation of air to keep the chamber cool. Chamber 64 has a base plate or slide 65 press fitted or otherwise secured thereto.

Slide 65 has two catches 55 which project upwardly. The cover or cap 28 is hinged to wall 36, and pivoted or hingedly secured at 29 to the cover is an arm or pusher 30 of which one end is bifurcated, the extremities of each limb 52, 53 having a detent or notch 54 which may be shaped as shown in Figure 11 and engaging the catch 55 of slide 65. A spring 31 presses on the arm or pusher 30 and against cover 28 so as to effect the engagement of 54 and 55 and also acts as means to swing or force open cover 28 when release button 32 is pressed inwardly. The base plate or slide 65 is provided with two channel members 57, 58 which guide the shank portion 59 of slideway or catch plate 34 and when the cover 28 is open, i. e., in the operative position shown in Figs. 7 and 8 the catalyst unit 56 lies vertically above the fuel opening 42. In closing and opening cover 28, pusher 30 will cause holder 53 to slide forward and backward over opening 42, and when the cover 28 is closed the holder 56 will slide away from opening 42 to an inoperative position as seen in Fig. 9.

The arm 30 carries on its underside a gasket 41 which may be a pad of rubber or rubber composition or the like and a stud or button 51 pro-

jects from the upperside of arm 30. When the cover is open pad 41 is clear of the fuel opening 42 and air opening 43, but when the cover is closed arm 30 moves holder 56 to the position shown in Figure 9, and the pad 41 is brought into a position over the openings 42, 43, the cover 28 exerting a slight pressure on the stud 51 to ensure that the pad effectively seals said openings.

To localize the wick or absorbent material 46 to provide a vapor space there surrounding an upper screen or perforated plate 45 and a lower screen or perforated plate 47 are provided which are spaced from the top and bottom respectively of the casing to provide the respective fuel vapor and air passages 68, 67. The wick 46 is, and screens 45, 47 may be, confined within the casing so as to provide the fuel vapor and air passages 49, 50 communicating with passages 68, 67. Tube 44 passes through the screens 45, 47. A complete circuitous path is thereby provided on either side of tube 44 for the commingled fuel vapor and air to reach the catalyst P.

It will be seen from the above that when cover 28 is closed the fuel chamber is sealed and the catalyst holder or chamber unit 56 is removed from the fuel opening 42 whereas on opening cover 28 the unit 56 is brought into an operative position. A cigarette or the like held against the screen S of the catalyst cup 153' will be lighted if suction be applied by drawing upon the cigarette, owing to vapor and air (entering the casing through duct 43) mixing in the passages in the casing and entering the catalyst cup in the presence of the catalyst incandescing the latter.

The container may be refilled at any time by removing unit 56 from pusher 30 and slideway 34. This is accomplished by sliding unit 56 away from pusher 30 along slideway 34 (in which case catches 55 leave the notches 54), and detaching unit 56 from slideway 34 by passing the guides 57, 58 through the notches 62 in slideway 34. The catalyst unit may thus be removed from opening 42 into which the fuel may be poured. Replacement of unit 56 is readily effected by slidingly engaging the unit with slideway 34 through notches 62 and by sliding the catches 55 under the detents 54. The portion of top plate 35 surrounding openings 42, 43 is raised as indicated at 70 to prevent the fuel from escaping between the plate 35 and unit 56 when the latter is in operative position.

In order to maintain a seal tight joint at the bottom of the casing 26, a plate or auxiliary bottom 48 is soldered or welded to wall 36. The casing is then finished off for ornamental purposes by press fitting a false bottom plate 63 within wall 36, below plate 48.

Variations within the spirit and scope of my invention are equally comprehended by the foregoing disclosure.

What I claim as new, and desire to secure by Letters Patent, is:

1. A lighter comprising a casing, a cover for the casing, absorbent material to be saturated with vaporizable fuel, contained within said casing; said casing provided with air admission means enabling atmospheric air to contact with said absorbent material, a catalyst, means for arranging said catalyst in the path of fuel charged air from said casing; said latter means including an outer tubular member provided with a bottom having an opening, a holder within the said member for the catalyst, the said holder having tongues in contact with, and spacing the holder from, the said tubular member; the

catalyst being located within the holder, and means operable by the cover to close said air admission means and said path.

2. A lighter comprising a casing, a cover for the casing, absorbent material to be saturated with vaporizable fuel, contained within said casing, said casing provided with air admission means enabling atmospheric air to contact with said absorbent material, a catalyst, means for arranging said catalyst in the path of fuel charged air from said casing, said latter means comprising a slidable support; said support including an outer tubular member provided with a bottom having an opening, a holder within the said member for the catalyst, the said holder having tongues in contact with, and spacing the holder from, the said tubular member, and means operable by the cover to close said air admission means and said path.

3. A lighter comprising a casing, a cover for the casing, absorbent material to be saturated with vaporizable fuel, contained within said casing; said casing provided with air admission means enabling atmospheric air to contact with said absorbent material, a catalyst, means for arranging said catalyst in the path of fuel charged air from said casing; said latter means including an outer tubular member provided with a bottom, a heat resisting element resting on said bottom, and a holder resting on said element, said bottom, element and holder having axially aligned openings communicable with said path, and means operable by the cover to close said air admission means and said path.

4. A lighter comprising a casing, a cover for the casing, absorbent material to be saturated with vaporizable fuel, contained within said casing; said casing provided with air admission means enabling atmospheric air to contact with said absorbent material, a catalyst, means for arranging said catalyst in the path of fuel charged air from said casing; said latter means including an outer tubular member provided with a bottom having an opening, a holder within the said member for the catalyst, the said holder having tongues in contact with, and spacing the holder from, the said tubular member; said holder being provided with a recess in its wall adjacent the catalyst to prevent the tip of the applied cigarette while being ignited from touching the holder, and means operable by the cover to close said air admission means and said path.

5. A lighter comprising a casing, a cover for the casing, absorbent material to be saturated with vaporizable fuel, contained within said casing; said casing provided with air admission means enabling atmospheric air to contact with said absorbent material, a catalyst, means for arranging said catalyst in the path of fuel charged air from said casing; said latter means including an outer tubular member provided with a bottom, a heat resisting element, resting on said bottom, the bottom and element having axially aligned openings, and a holder resting on said element, the holder having a throat portion extending within and engaging the wall of the element opening, and means operable by the cover to close said air admission means and said path.

6. A lighter comprising a casing for containing fuel and provided with air admission means enabling atmospheric air to contact with said fuel, a catalyst, means for arranging said catalyst in the path of fuel charged air from said casing, said latter means comprising a chamber, and a

holder within said chamber, said holder having
lugs at its rim in contact with, and spacing the
holder from, said chamber, the catalyst being
within said holder, said chamber having means
5 engageable with the ends of said lugs for retaining
the holder within the chamber.

7. A lighter comprising a casing for contain-
ing fuel and provided with air admission means
enabling atmospheric air to contact with said

fuel, a catalyst, means for arranging said catalyst
in the path of fuel charged air from said casing,
said latter means comprising a chamber, and a
holder within said chamber for said catalyst,
said holder being provided with a recess in its
wall adjacent the catalyst to space the tip of the
cigarette when applied, from touching the holder. 5

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