

June 18, 1935.

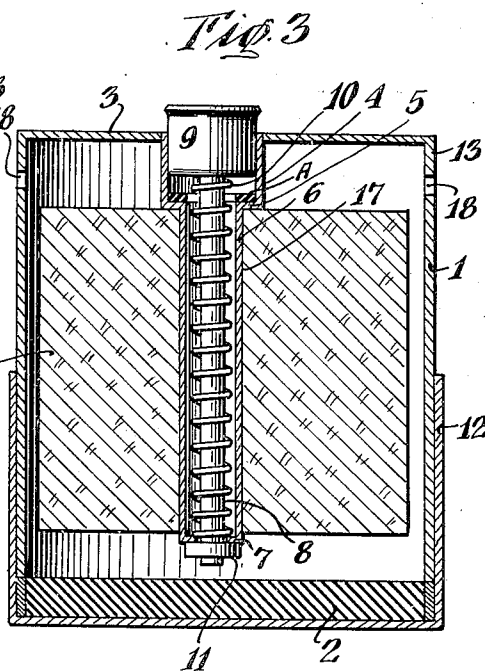
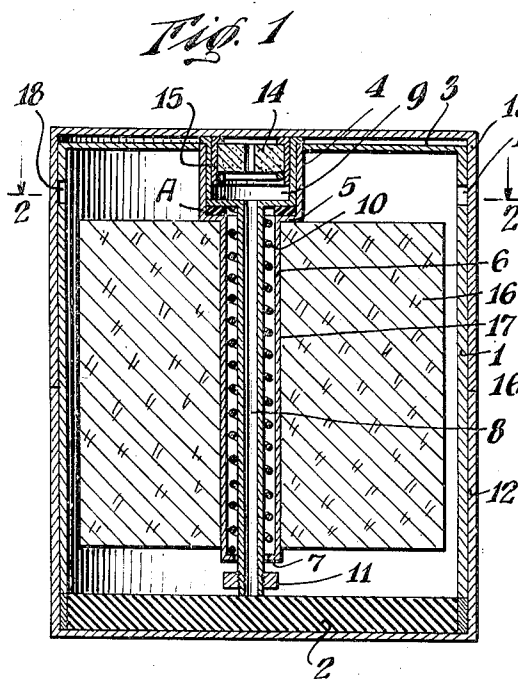
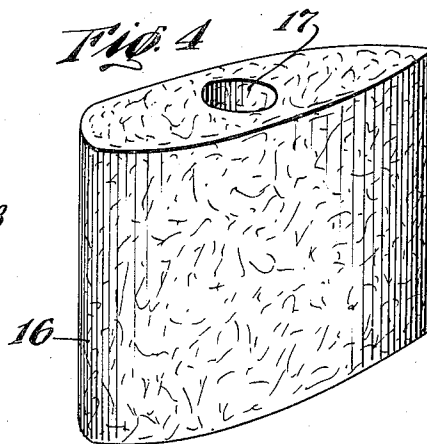
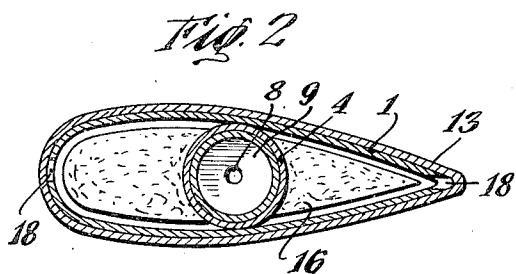
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2,005,477

LIGHTER

Filed Jan. 12, 1934

3 Sheets-Sheet 1



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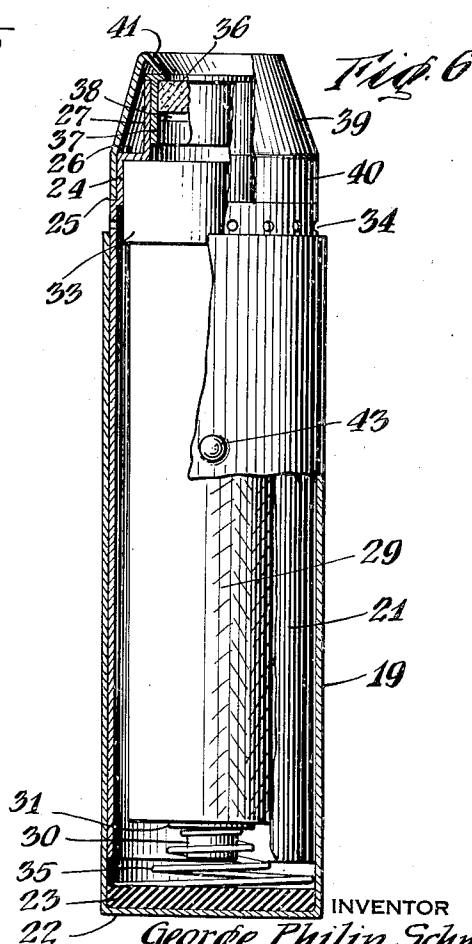
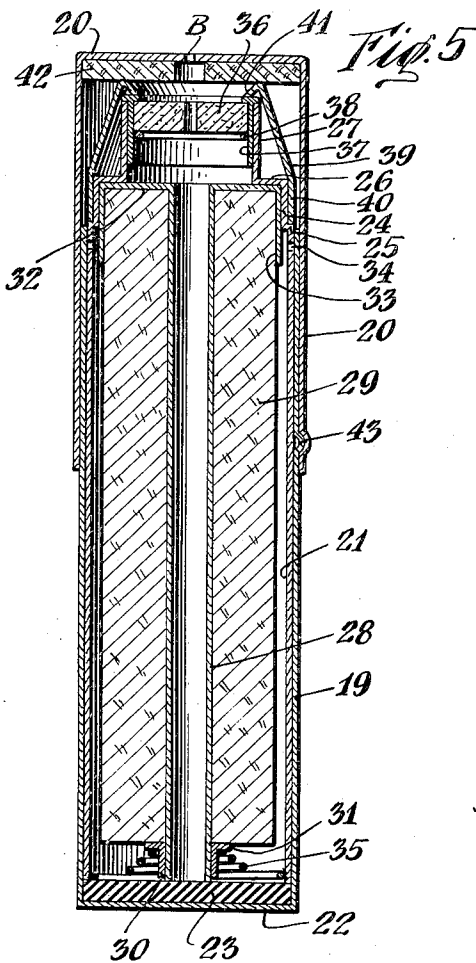
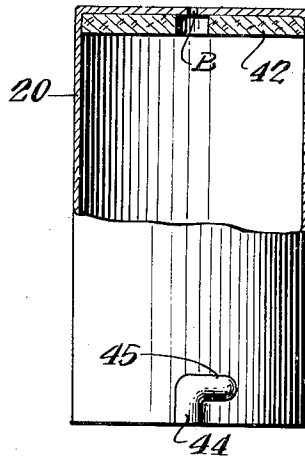
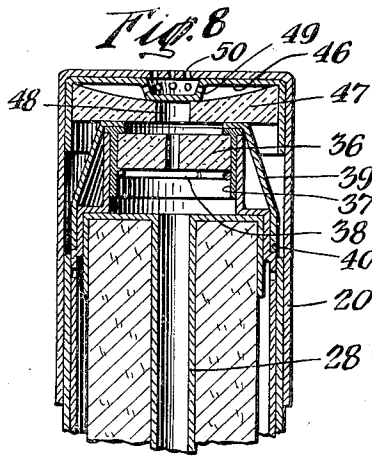
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

Fig. 10

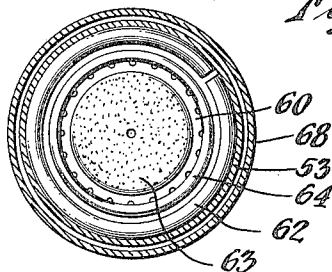


Fig. 9

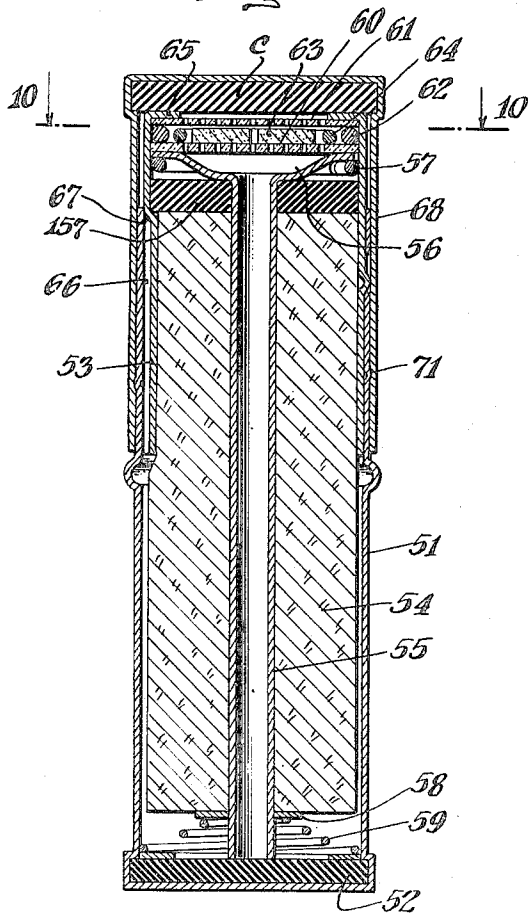
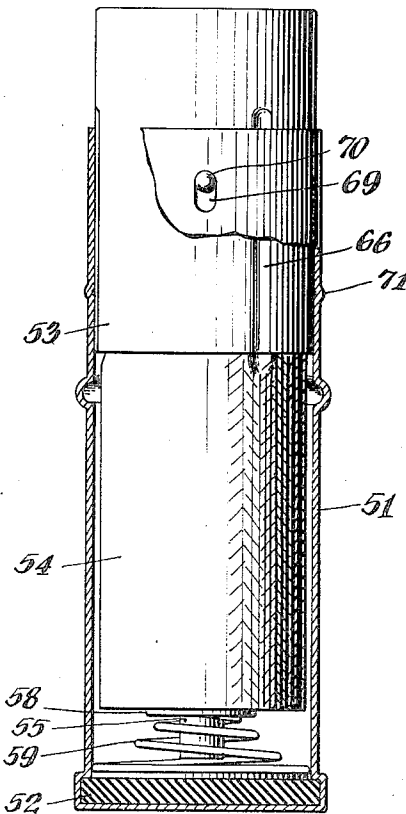


Fig. 11



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2,005,477

LIGHTER

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Application January 12, 1934, Serial No. 706,368

25 Claims. (Cl. 67—7)

This invention relates to lighters for cigarettes and the like, wherein a pervious catalyst is employed as the igniting element, wherein vaporizable fuel, carried by absorbent material, supplies vapor for co-action with the catalyst, and wherein means are provided for mingling atmospheric air with the vapor supplied to the catalyst.

In catalytic lighters it has been found that if the catalyst is held in the presence of fuel vapor for a prolonged period, the lighter being closed, the confined vapor will condense upon the catalyst and render it inactive until said catalyst has been dried out.

Therefore my improvements, comprised in this application, which is a continuation in part of my application Serial No. 702,504, filed December 15, 1933, include the provision of means, operable in the act of closing the lighter, to shut off the catalyst from communication with the mingled vapor and air supplies, to the end that in the quiescent state of the catalyst, while the lighter is out of service, no opportunity may be presented for the collection upon the catalyst of condensation from the fuel vapor.

Also my improvements include the provision of means whereby the act of opening the lighter releases a spring whose tension, stored in the act of closing the lighter, opens the normally closed air admission means to the casing interior and restores communication between the catalyst and the fuel vapor and air supplies, which then co-act with the catalyst to render it incandescent.

Further my improvements include the provision of a preformed mass of absorbent material, having a lengthwise aperture therethrough, and a tubular member that is fitted within said aperture and is engaged in fixed relation within the lighter casing, which casing, as stated, has air admission means, whereby said mass is held in spaced relation with respect to the wall, base and top of the casing, said tubular member enclosing an inner tube which at its upper end carries the catalyst, a spring normally projecting said inner tube so that its upper end extends beyond the casing top and its lower end is distanced from the casing base, whereby air and vapor from the fuel in the mass may flow through said inner tube to the catalyst, together with a cap which is adapted to be fitted over the casing, said cap serving to close the air admission means and to depress the inner tube against the tension of its spring, thereby seating the inner tube at its lower end against the casing base, and thus shutting off communication between the casing interior and the catalyst.

Still further my invention includes the provision of ventilating means for the cap, when fitted over the casing for the escape of vapor which may be entrapped by said cap in closing the lighter.

Another feature consists in novel means for positioning the catalyst between foraminous disks, bounded peripherally by a floating ring that guards the catalyst, while quiescent, from attack by the product of fuel vapor condensation, while permitting fuel vapor and air to co-act with the peripheral edge of the catalyst in the operation of the lighter.

Other features and advantages of my invention will hereinafter appear.

In the drawings:—

Figure 1 is a side sectional elevation of my improved lighter in its closed position.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a side sectional view of the lighter, without its cap, and thus in condition for use.

Fig. 4 is a perspective elevation of an absorbent mass, in preformed shape, for use in the lighter.

Fig. 5 is a side sectional view of a lighter in cylindrical form, with modified closing and opening means, the cap being applied, to close the lighter, in this view.

Fig. 6 is a similar view of the structure shown in Fig. 5, partly broken away, the cap being removed and the lighter appearing in operative condition.

Fig. 7 is an elevational view, with parts in section and parts broken away, of the cap.

Fig. 8 is a partial side section of the lighter with a modified cap, having ventilating means, applied thereto.

Fig. 9 is a side sectional elevation of the cylindrical form of lighter, with the cap applied, having novel means for excluding vapor condensate from the catalyst.

Fig. 10 is a section on the line 10—10 of Fig. 9, and

Fig. 11 is a side elevation with the casing broken away, and without the cap, showing the lighter in operative condition.

In Figs. 1 to 4 let 1 indicate the wall of a casing which may be of stream-lined or other suitable shape in cross-section, and adapted to contain a vaporizable fuel vehicle, said casing having the base 2 and top 3.

The top 3 is provided with a depressed, hollow portion 4, which continues downwardly, past an annular shoulder 5, forming the base of portion 4, in the form of a reduced, tubular member 6, whose lower end, which is spaced from the casing base 2, 55

has an intumed flange 7 that encompasses a central orifice.

Disposed within member 6 is a tube 8, of much smaller diameter, whose lower end is passed slidably through the orifice in flange 7, and whose upper end is enlarged to form a cup 9 that is adapted to fit slidably within hollow portion 4.

Surrounding tube 8, within member 6, is a helical spring 10, whose lower end engages the flange 7 and whose upper end engages the under side of cup 9, the tension of the spring, when unrestrained, serving to hold the tube 8 elevated so that its lower end is out of contact with the casing base 2. Means, to be described, are provided for compressing spring 10 and pressing the lower end of tube 8 into contact with base 2, to thereby shut off communication, through said tube, between the casing interior and the interior of cup 9. With the spring thus compressed the periphery of cup 9 is about in the plane of the casing top 3 (see Fig. 1); but, when the spring is expanded it lifts the end of tube 8 away from base 2 to provide a suitable clearance therebetween, a nut 11 on said tube co-acting as a stop with the lower end of member 6, to limit the extent of this movement, and the cup 9 is lifted up beyond the plane of top 3 (see Fig. 3).

A shell 12 fits snugly over the lower portion of casing 1, and the base 2 may be suitably held within said shell, so as to be removable therewith. Also a cap, in the form of a shell 13, is adapted to fit snugly, though removably, over the upper portion of the casing, said cap 13 when pressed to its fully closed position, having depressed the cup 9 into hollow portion 4 and pressed the tube 8 against base 2.

Between cup 9 and shoulder 5 there is interposed a gasket A of soft rubber-like material to effect a leak-tight joint at this point when the cap has been applied in the lighter closing position.

The cup 9 contains the catalyst, here shown at 14 as held within a socket 15 that is suitably supported in said cup. The catalyst may consist of a platinum black composition or the like, suitably apertured, as is usual with this class of lighter.

Located within the casing is the absorbent material that is to be charged with vaporizable fuel, such for example as methanol or the like. As here shown the absorbent material is in the form of a block 16, of preformed shape, corresponding to the interior shape of the casing and of such smaller size as to provide a clearance space for air between said block and the wall, top and base of the casing. Also said block 16 is fixed in its location by being mounted on the member 6, said member for that purpose being fitted within an orifice 17 formed longitudinally through said block.

Air admission holes 18 are formed in the casing wall at points located in a plane above the block 16.

Thus in the act of lighting a cigarette whose end is applied to the catalyst, air drawn in through holes 18 will pass all around the block 16 before entering tube 8, flowing there through with entrained fuel to the catalyst.

In Figs. 5, 6 and 7 there appears a modification of my lighter wherein it is shown in cylindrical form, having a casing 19 and a closure cap 20, which may have a vent hole B.

Slidably and removably fitting within casing 19 is a sleeve 21, whose lower end is adapted to co-act with the casing base 22, said base being here shown as provided, inside the casing, with a cushion-like pad 23 that may be composed of rub-

ber or the like, for a purpose to be referred to hereinafter.

Sleeve 21 is provided near its upper end with a reduced portion 24 which is merged therewith by an annular shoulder 25, and said portion 24 is again reduced, in merging relation therewith by an intumed flange or shoulder 26, to provide a neck portion 27.

A tubular member 28, which is extended axially through a preformed, cylindrical mass of absorbent material, indicated at 29, and intended to be charged with vaporizable fuel, is provided, near its lower end, with a ferrule 30, said ferrule having a flange 31 that serves as a bottom support for the absorbent mass, to maintain a clearance between said mass and the casing base.

Member 28, at its upper end, is expanded in the form of a radial flange 32, from whose peripheral edge there depends a tubular skirt 33, said skirt surrounding the upper portion of mass 29, which upper portion is thus encased between member 28, skirt 33 and flange 32. The skirt 33 is fitted tightly in sleeve portion 24, to effect their frictional union, whereby the sleeve 21, tubular member 28 and absorbent mass 29 become an integrated unit. The mass 29 is of smaller diameter than the interior of sleeve 21 so that a suitable clearance may be left between these elements, and the sleeve 21 is provided with apertures 34 for the admission of air to said clearance.

A helical spring 35 is centered on the casing base, this spring in the example illustrated being imposed on cushion 23, where it surrounds the ferrule 30, and as relaxed, in Fig. 6, supports the unit with the lower end of member 28 spaced from the casing base, and the sleeve 21 with its air holes 34 exposed above the top of casing 19, whereby air can enter the clearance between the absorbent mass and the casing, and pass upwardly through tubular member 28.

The perforated catalyst, here shown at 36, is held within a tubular holder 37 whose wall is of T-shape in cross-section, the cross of the T providing an inward flange to engage and retain the catalyst from outward displacement, and an outward flange to engage the upper edge of the sleeve neck 27, within which neck the holder is tightly fitted, so that said catalyst holder also becomes integrated in unitary form with the sleeve, tubular member and absorbent mass.

The catalyst is supported at its under side by a split ring 38 that is tensioned within the holder 37.

A hollow cone 39, having a lower, cylindrical portion 40, is adapted to fit thereby upon the reduced portion 24 of the sleeve 21, while the upper end of the cone is angled inwardly and downwardly, as at 41, to bear against the T-top of holder 37, thereby providing an ornamental finish to the lighter, while the angled portion 41 affords guide means for centering a cigarette end against the catalyst in the act of lighting.

Cap 20 is shown as provided with an inner, top lining or pad 42 of soft, cushion-like material, capable of effecting a tight joint when impinged upon cone 39 in fitting the cap upon the casing. Said cap, when pressed downwardly upon the casing, serves to force the unit downwardly within the casing, compressing spring 35 until the lower end of tubular member 28 is pressed tightly upon gasket 23, to thereby prevent the flow of air to the interior of said tubular member from the sleeve interior. This cap enclosed position is shown in Fig. 5 wherein it also appears that the sleeve 21 in its movement within casing 19 has

caused the air holes 34 to be covered by said casing, thus excluding admission of atmospheric air while the lighter is closed.

In order that the cap may be locked upon the casing when closed thereon, the casing is shown as having a protuberance 43 adapted to receive the straight-line portion 44 of an angled groove formed in the cap wall, said groove also having a right-angular extension 45 to engage the protuberance when the cap is given a slight turn in its fully seated position. It will be noted that the absorbent mass holder, consisting of flange 32 and skirt 33 affords an effectual barrier between the fuel holding mass and the catalyst, and that air laden with fuel vapor can reach the catalyst only by way of tubular member 28, when said member is open to the casing interior.

In Fig. 8 the cap 20 is shown as provided with a lining 46 that carries a block 47 of porous material which is adapted to lie upon the top of cone 39 in the closed position of the cap, said block 47 also having a central aperture 48. The purpose of the porous block is to absorb vapor that may remain in the lighter after it has been closed, so that said vapor may not condense upon the catalyst. Also the lining is shown as having a perforated, cup shaped pendent portion 49 to receive the vaporous emanations from block 47, and the cap itself is provided with perforations 50 to permit escape of these emanations from the pendent portion 49.

In the modification of Figs. 9, 10 and 11 the casing 51, in whose base there is placed a pad or gasket 52, slidably receives a sleeve 53, which is entered in said casing through the open, upper end thereof, said sleeve, which is adapted to be entered only partway in the casing, having one end portion of an absorbent mass 54 fitted engagingly therein, but said absorbent mass, which is of preformed cylindrical contour, continuing downwardly to a point near, but spaced from the casing base. A tubular member 55 is extended axially through the mass 54, which latter is suitably apertured for its reception, said member 55 being expanded at its upper end into a radial flange 56 here shown somewhat in the form of a bell-mouth, a split ring 57 engaging beneath said flange and being tensioned against the wall of sleeve 53.

Beneath the flange 56, is a partition 157 composed of some contractible and expansible material, having the character of rubber in the respect that it can be securely fitted within sleeve 53, above the mass 54, to constitute a leak-tight joint that will prevent the passage of fuel, with which the absorbent mass is charged, or vapor therefrom. This partition is pierced with an aperture capable of receiving the tubular member 55, which is in equally leak-tight relation therewith. A washer 58, secured upon member 55, toward its lower end, serves as the bottom support for mass 54, and a helical spring 59, centered upon base 52, engages said washer to thereby support the elements 53, 54, 55 and 157 in the extended position thereof indicated in Fig. 11. Supported upon flange 56 is a perforated disk 60, which may be of mica. Another perforated disk 61 which also may be of mica, is supported in spaced relation to disk 60 by means of a split ring 62 that is tensioned against the sleeve wall, and also serves to space the disks 60, 61. The disks 60, 61 contain between them the catalyst, here shown in the form of a perforated disk 63, and a free ring 64 encircles disk

63, said ring being spaced both from disk 63 and the split ring 62.

It is to be understood that the catalytic disk 63 is not clamped between the disks 60, 61 because I have found that if free therefrom the suction effect produced in drawing through a cigarette applied to the outer disk enables the rising vapor to react more efficiently upon the catalyst surface. The free or floating ring 64 which can have only a single point contact with the catalytic disk, performs the useful function of guarding the catalyst periphery from the attack of liquid fuel and vapor condensate therefrom. Also said free ring, by virtue of its being spaced from the catalyst enables fuel vapor to react upon the periphery of the catalyst when the lighter is in service. The free ring further serves to check the creeping of liquid alcohol in the direction of the catalyst.

The sleeve 53 at its upper end has an inturned flange 65 that extends over a portion of disk 61 to retain it and the catalyst against dislodgment.

Air is admitted into the casing by means of one or more grooves 66 formed longitudinally in the sleeve 53, between said sleeve and casing 51, said grooves terminating upwardly in shoulders 67 that serve as supporting means for the partition 157. The grooves 66 are shown in Fig. 11 exposed at their upper ends beyond the top edge of casing 51, to thus be capable of admitting air to the lighter interior.

The cap, 68, which is adapted to be fitted over the casing, and may have an inside pad C is used to force the sleeve and its associated elements inwardly until the tubular member 55 engages the pad 52 to close the passage through said member as shown in Fig. 9. In this position also the grooves 66 are completely covered and closed by the casing.

The sliding movement of the sleeve is limited by a vertical slot 69 in the casing which is engaged by a projection such as protuberance 70 upon the sleeve 53, this limited movement representing the effective expansion and contraction of spring 59.

So that the cap 68 may become tightly engaged upon the casing the latter is shown as encircled by a bead 71 which effects a strong friction hold in co-action with said cap.

The gasket or pad which is placed in the base of the lighter casing is employed for the purpose of effecting a leak-tight closure for the fuel and air supply tube when said tube is pressed firmly against said gasket in the closed position of the lighter.

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

I claim:

1. A lighter comprising a casing having a fuel chamber, a catalyst located above said chamber and having a side presentable toward a cigarette, said casing having an air inlet near the upper end thereof, a conduit extending from the other side of said catalyst to the vicinity of the lower end of said chamber, said conduit being arranged between said catalyst and said inlet and means for closing said conduit when the lighter is not in use.

2. A lighter comprising a casing having a fuel chamber open to the atmosphere, a catalyst located adjacent said chamber and having a side presentable toward a cigarette, there being a conduit between said chamber and the other side of said catalyst, a cap for said casing, and means

operable by said cap for closing said conduit when the lighter is not in use.

3. A lighter comprising a casing having a fuel containing chamber open to the atmosphere, a catalyst, a conduit including movable valve means affording communication between said chamber and conduit, a removable cap slidable on and off said casing, and means carried by and projecting beyond said casing for abutment with said cap, said last named means partaking of the movement of said cap to effect closure of said valve means.

4. A lighter comprising a casing having a fuel chamber, a cap for said casing, a catalyst carried by means mounted for reciprocatory movement with respect to said casing and held out of communication with said chamber when said cap is in place, said cap being apertured to provide communication with the atmosphere, and automatic means including said first-mentioned means for effecting communication between said chamber and catalyst upon removal of said cap.

5. A lighter comprising a casing having a fuel chamber, a catalyst located adjacent said chamber, a tube communicating with said catalyst and extending into said chamber, and means for moving one end of said tube against a wall of said chamber to isolate the catalyst therefrom.

6. A lighter comprising a casing having a fuel chamber, a unit slidably mounted in said chamber said unit including a catalyst and a tube extending from said chamber to said catalyst, one end of said tube being adapted to abut a wall of said chamber in air sealing relation, spring means normally urging said tube away from said wall, and means for holding said tube against said wall when the lighter is not in use.

7. A lighter comprising a casing, a catalyst at the upper end of said casing, a tube extending from said catalyst toward the lower end of said casing, an absorbent body surrounding said tube and adapted to hold a vaporizable fuel, there being a space between said body and the walls of said casing, means for circulating air into said space and thence through said tube, and means for closing said tube to isolate the catalyst from said space when the lighter is not in use.

8. A lighter comprising a casing, absorbent material, to be saturated with vaporizable fuel, contained within said casing, said casing provided with air admission means enabling atmospheric air to pass around and through said absorbent material, a catalyst, means for supporting said catalyst in the path of vapor from said fuel, and means for shutting off the flow of vapor to the catalyst when the lighter is not in use.

9. A lighter comprising a casing, absorbent material, to be saturated with vaporizable fuel, contained within said casing, said casing provided with air admission means enabling atmospheric air to pass over said absorbent material, a catalyst, means for supporting said catalyst in the path of fuel charged air from said casing, spring actuated means to hold said air admission means open when the lighter is in use, and means operable to close said air admission means.

10. A lighter comprising a casing, absorbent material, to be saturated with vaporizable fuel, contained in said casing, said casing provided with air admission means enabling atmospheric air to pass over said absorbent material, a catalyst, means for supporting said catalyst in the path of fuel charged air from said casing, spring actuated means to hold open the path to the

catalyst, and means operable to close said path.

11. A lighter comprising a casing, absorbent material, to be saturated with vaporizable fuel, contained in said casing, said casing provided with air admission means enabling atmospheric air to pass over said absorbent material a catalyst, means for supporting said catalyst in the path of fuel charged air from said casing, spring actuated means to hold open the path to the catalyst, and a cap for said casing, said cap when applied to the casing serving to close said air admission means and shut off the fuel path to the catalyst.

12. A lighter comprising a casing, having air admission means, a mass of absorbent material adapted to be charged with vaporizable fuel, supporting means for said mass to hold it within the casing in spaced relation therewith, a pervious catalyst, a holder therefor, means of communication between said catalyst and the interior of said casing for the reaction of fuel and air upon the catalyst, and means for closing said means of communication and air admission means.

13. A lighter comprising a closed casing having air admission means, a mass of absorbent material adapted to be charged with vaporizable fuel, tubular means in said casing supporting said mass in spaced relation within said casing, a pervious catalyst, a tubular holder carrying said catalyst at one end thereof, said holder extending through said tubular means, spring means to project the upper end of said holder normally beyond the casing top with its lower end spaced from the casing base, to admit fuel and air to the catalyst, and cover means adapted to close said air admission means and to press said holder into closing contact with the casing base.

14. A lighter comprising a casing having air admission means, a catalyst, a preformed mass of absorbent material within and spaced from said casing, holding means for said mass including means for separating said mass from said catalyst and a tubular member that extends through said mass and is adapted to abut against the casing base to close communication there-through from the casing interior, spring means to extend said tubular member away from said casing base, causing said mass holding means to uncover said air admission means, means for supporting said catalyst in the path of vapor from said tubular member, and a cap for said casing, said cap when applied to the casing contracting said spring means and causing said mass holding means to close said air admission means, also causing said tubular member to abut against the casing base to close the passage through said tubular member.

15. A lighter comprising a casing, a catalyst supported thereby, means in said casing for supplying fuel vapor and air to said catalyst, a cap for said casing and an absorbent member in said cap, opposed to said catalyst, to capture vapor condensate, and means in said cap to receive and permit escape of vapors emanating from the captured vapor condensate.

16. A lighter comprising a casing, a unitary structure, slidable therein, composed of a sleeve having confining means at one end, a catalyst retained on one side by said confining means, a tube whose lower end is adapted to co-act with the casing base to close it, a bell-mouth flange at the upper end of said tube to co-act with said catalyst, a preformed mass of absorbent material surrounding and carried by said tube, said mass

adapted to be charged with vaporizable fuel, means for admitting atmospheric air into said casing to pass with entrained fuel through said tube, spring means to raise said unitary structure and thereby open said tube, means for depressing said unitary structure, to close said tube against the tension of said spring means, and a partition of contractible and expansible material in said sleeve, in leak-tight relation therewith, separating the fuel charged mass from the catalyst.

17. A lighter including a catalyst in the form of a permeable disk, respective retaining disks of perforated sheet material in non-clamping relation at opposite sides of said catalyst, holding means for said retaining disks, means for supplying fuel vapor and air to said catalyst, and a ring loosely surrounding said catalyst, between said disks, to guard it against the attack of liquid fuel and its vapor condensate.

18. A lighter comprising a casing, a wick disposed in the casing and adapted to hold a quantity of volatile liquid, a cover movable into and out of engagement with the casing, a support carried by the casing above said wick, a catalytic element mounted on said support, said cover being arranged to uncover an air port to permit the flow of air to the wick, the wick having a passage therein to receive the air, said passage being arranged to emit air carrying vapor from the wick to the catalytic element, and a movable closure automatically movable into a position to prevent the flow of air from the wick to the catalytic element when the cover is in its normal position in engagement with the casing.

19. A lighter comprising a casing, a wick disposed in the casing and adapted to hold a quantity of volatile liquid, a cover movable into and out of engagement with the casing, a support carried by the casing above said wick, a catalytic element mounted on said support, said cover being arranged to uncover an air port to permit the flow of air to the wick, the wick having a passage therein to receive the air, said passage being arranged to emit air carrying vapor from the wick to the catalytic element, a movable closure automatically movable into a position to prevent the flow of air from the wick to the catalytic element when the cover is in its normal position in engagement with the casing, and spring means effective to move the closure out of said position when the cover is moved out of engagement with the casing.

20. A lighter comprising a casing, a wick holder mounted within the casing, a cover for the casing, a cap element slidably mounted in relation to the casing, a spring within the casing urging the cap element upwardly against the cover, a support provided by said cap element, a catalytic element mounted on the support, the cap element being movable in response to the movement of the cover into engagement with the casing to prevent

the flow of air from the interior of the casing to the catalytic element.

21. A lighter comprising a casing having a fuel chamber, means mounted for reciprocatory movement with respect to said casing, a catalyst mounted on said means, a cap for said casing to cover said catalyst, and means to cooperate with said first-mentioned means whereby said catalyst is held out of communication with said chamber when said cap is positioned to move said first-mentioned means into cooperation with said second-mentioned means.

22. A lighter comprising a casing, a wick in said casing adapted to be charged with vaporizable fuel, means slidable in said casing to support the wick in spaced relation therein, a tube extending through said wick and mounted on said means with its lower end adapted to co-act with the casing base to close it, a catalytic element mounted on said means adapted to be presented to a cigarette or the like, a bell-mouth flange at the upper end of said tube to direct air and fuel vapor mixture to said catalytic element and to isolate said wick therefrom, resilient means to raise said first-mentioned means and thereby open said tube, means for depressing and holding said first-mentioned means in said casing to close said tube, and air passages into said casing adapted to be closed when said first-mentioned means are depressed and held in said casing.

23. A lighter comprising a casing, a wick to be charged with vaporizable fuel supported in spaced relation within said casing, a catalytic element adapted to be presented to a cigarette or the like, a tube supporting said catalytic element at one end and having its other end extending through said wick to provide communication between said catalytic element and the interior of said casing, said tube being longitudinally movable with respect to said wick to allow its lower end to co-act with the base of said casing to close it, air passages into said casing, and means to move said tube to close it and to close said air passages.

24. A lighter comprising a tubular casing, a sleeve slidably mounted therein, said sleeve having air admission means, a catalyst, a holder for said catalyst connected to said sleeve to be slidable therewith, a tube extended from said holder and adapted to abut against the bottom of said casing, and absorbent material carried by said tube in spaced relation with said sleeve and casing.

25. A lighter comprising a tubular casing having a groove in its wall, a sleeve slidably mounted in said casing and having a projection to ride in said groove and limit the reciprocatory movement of said sleeve, a catalyst, a holder therefor connected to said sleeve to be slidable therewith, a tube extended from said holder, absorbent material carried by said tube, said sleeve provided with air admission means, and respective means for opening and closing said tube to admit and shut off the supply of air to said catalyst.

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