

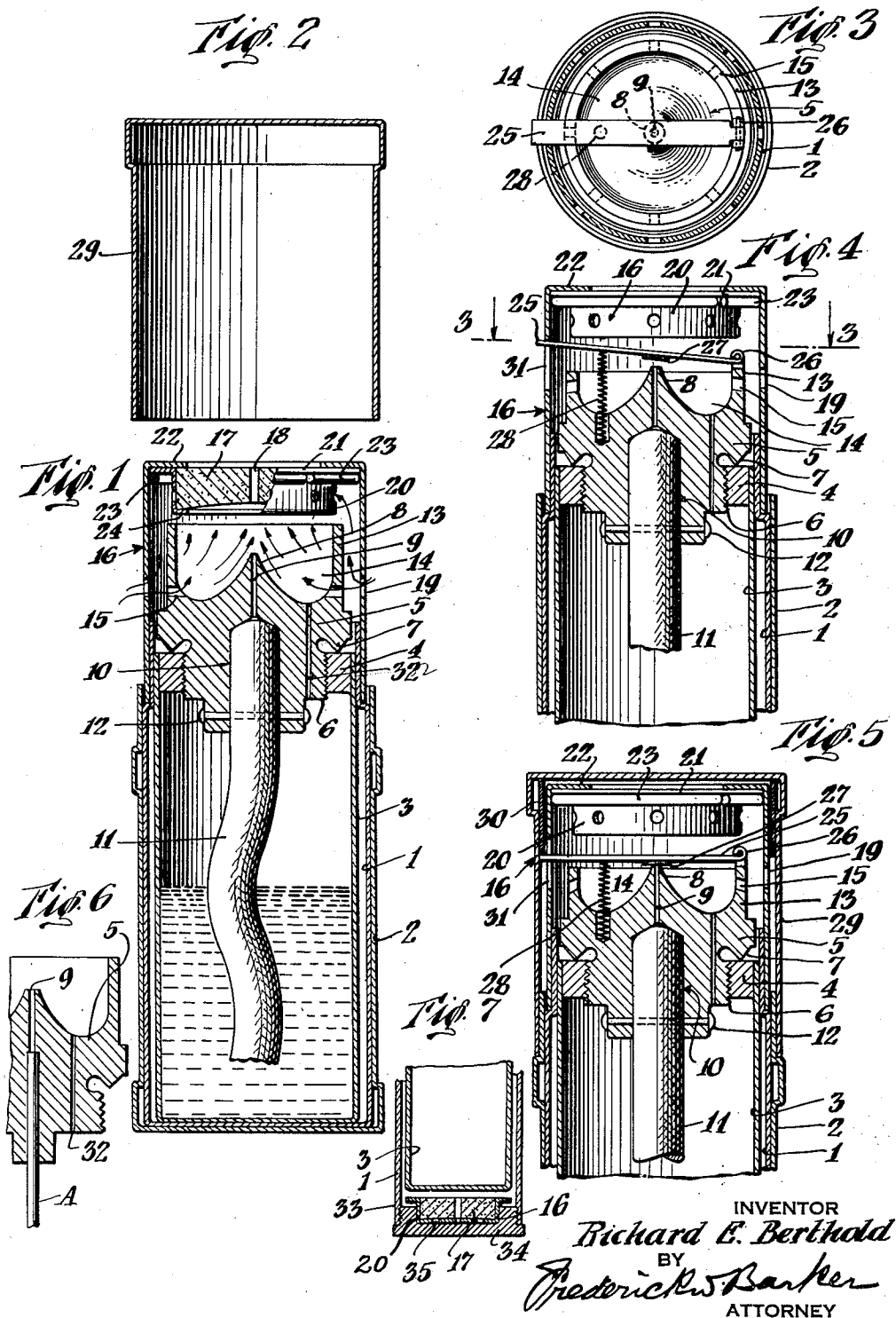
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LIGHTER

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LIGHTER

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This invention relates to lighters, of the class employing a catalytic element, such for example as platinum black, to co-act with the vapor of a vaporizable fluid, such as alcohol, in the presence of air, to render the catalytic element incandescent, so that it may serve to ignite a cigarette or the like applied thereto.

In my earlier U. S. Patent No. 1,899,008, dated February 28, 1933, and in my patent application for Lighter, Serial No. 673,257, filed May 27, 1933, I have disclosed lighters of this general character, wherein the vaporizable fluid is contained by absorbent material that is held in a casing; but in the present development I provide a container for vaporizable fluid in liquid form, providing said container with a small nozzle orifice, from which a flow of fluid vapor can be had as by the application of a cigarette to the element, which is perforated, and drawing upon the cigarette to afford the necessary suction effect, the provision also being made for a flow of air over the nozzle, for admixture in a mixing chamber with fuel which is drawn from said nozzle.

In some instances I may employ either a wick or a capillary tube, to communicate the fluid from the container to the nozzle orifice.

A removable cap is provided to enclose the catalytic element and the mixing chamber.

Also, in order that fuel may not leave the nozzle while the catalytic element and the mixing chamber are enclosed by the removable cap, I provide closure means for the nozzle, spring urged to the nozzle open position when the cap is off, but operative to close said nozzle in the act of placing the cap on the casing to enclose the catalytic element and the mixing chamber.

Still further my improvement includes the provision of an additional catalytic element, contained in a socket member, for replacement purposes, and carried when not in use in the rear end of the casing.

Other features and advantages of my invention will hereinafter appear.

In the drawing:

Figure 1 is a vertical, sectional, view of my improved lighter, with the cap removed.

Fig. 2 is a similar view of the cap.

Fig. 3 is a horizontal section, taken on the line 3-3 of Fig. 4.

Fig. 4 is a partial view, similar to that of Fig. 1, showing closure means for the nozzle in the released, open position.

Fig. 5 is a similar view to that of Fig. 4, but showing the cap applied, and the nozzle closure means thereby placed in the closed position.

Fig. 6 is a partial detail view of the plug, showing the use of a capillary tube to supply the fuel to the nozzle, and

Fig. 7 is a partial view showing a modified form of casing, open at its lower end and having a cap removably fitted therein, said cap being hollow and having removably lodged therein a socket member that carries an auxiliary catalytic element, for use in case the element in use becomes broken.

In said views let 1 indicate a casing, which may or may not be provided with an outer covering 2, and let 3 indicate a container which is adapted to contain a suitable vaporizable fluid, said container having at its outer end an internally threaded annulus 4, which may be integral with or secured to said container. A plug or boss 5, having an inner, threaded portion 6, is adapted to be screwed thereby into union with the annulus 4, said plug having a concentric, knife-edged portion 7, opposed to the outer surface of annulus 4, and adapted, when the plug is screwed tightly into the annulus, to impinge upon said outer surface, to thereby create a fluid and vapor tight joint.

The outer, central portion of plug 5 is provided with a nozzle structure 8 which has an axial orifice 9 for the emission of vapor from the fluid in the container, and, as here shown, said orifice communicates with a concentric enlargement 10 through the inner portion 6, which enlargement may receive one end of a wick 11 that is immersed in the fluid in the container to supply fluid by capillary action to the nozzle orifice. The wick is shown as lodged in the plug by means of a transverse pin 12. In the modification of Fig. 6 I have shown a capillary tube A, which extends from the plug 5 to near the bottom of container 3, and registers with the orifice 9 to supply fluid thereto.

Also the plug, at its outer portion, is provided with a concentric wall 13, surrounding the nozzle structure 8 and creating an enclosure 14, said wall being pierced with air admission orifices 15, whereby said enclosure 14 becomes a mixing chamber for atmospheric air and vapor.

A hollow holder 16, which supports the catalytic element 17 at one end, said element being perforated as at 18, is adapted at its other end to fit removably upon the casing 1, the wall of 50 said holder, which is spaced from the wall 13, being provided with air admission orifices 19.

The catalytic element is here shown as carried by a socket member whose wall 20, at its outer edge, is provided with a radial flange 21 55

that lies opposed to and abuts against an inturned flange 22 at the outer end of holder 16, means, here shown in the form of a split ring 23, which engages the wall of the holder, serving to retain the socket in its set position. The catalytic element is held within the socket by means of an inturned flange 24 at the inner end of socket wall 20 and by the aforesaid holder flange 22.

In Figs. 3 to 5 I have illustrated an additional feature in the form of closure means for the nozzle orifice 9, said closure means as here represented including an arm 25, pivoted at one end to the wall 13, as at 26, and extending across chamber 14, said arm bearing a sealing protuberance 27 adapted to co-act with orifice 9, to close it, but said arm being urged, as by a spring 28, which extends from plug 5, away from said orifice, to leave it open. Thus, when the cap, here indicated at 29, is removed from the casing, at which time it is desired to have vapor issue from orifice 9 for co-action with the catalytic element, in the presence of air, then the device will be in operative condition and the catalytic element will be rendered incandescent for igniting purposes.

But when closing the device by the application of cap 29, then it is desired to also close orifice 9, for which purpose the cap 29 is here shown as provided with an internal collar 30, and the length of arm 25 is extended so that its outer end, which projects through a slot 31 provided therefor in the wall of holder 16, will lie in the path of collar 30, which will thus press arm 25 inwardly in the closing action of the cap, and thereby cause the protuberance 27 to become seated upon the nozzle 8, to seal the orifice 9.

As means for breaking the vacuum in the fuel chamber 3 and thus permitting the fuel to flow through orifice 9 I provide venting means as by the passageway 32 formed through plug 5.

Also I may provide an extension 33 of the cylindrical wall of casing 1 and removably fit to said extension a cap 34, here shown as threaded and adapted to screw into said extension. Said cap, being hollow, is adapted to removably receive a supplemental socket 20 containing a catalytic element 17, so that in the event of breakage or other damage to the catalytic element in use this supplemental socket and element can take its place. The socket is here shown as having perforations 35 in its bottom instead of in its wall. Variations within the spirit and scope of my invention are equally comprehended by the foregoing disclosure.

I claim:—

1. A lighter comprising a casing, a container for vaporizable fuel removably fitted in said casing, said container having an open end, a stopper removably engaging said open end, to close it, said stopper having a nozzle orifice, a wall surrounding said nozzle orifice, said wall having air admission means and enclosing a mixing chamber, a catalytic element, a hollow holder adapted to co-act with said stopper to confine said chamber, said holder supporting said catalytic element in the path of vapor from said nozzle orifice, and removable closure means to enclose said catalytic element and air admission means.

2. A lighter comprising a casing, a container for vaporizable fuel removably fitted in said casing, said container having an open end, a stopper removably engaging said open end, to close it, said stopper having a nozzle orifice, a wall surrounding said nozzle orifice, said wall having air admission means and enclosing a mixing

chamber, a catalytic element, a hollow holder adapted to co-act with said stopper to confine said chamber, the wall of said holder having air admission means and being spaced from said stopper wall, said holder supporting said catalytic element in the path of vapor from said nozzle orifice, and removable closure means to enclose said catalytic element and air admission means.

3. A lighter comprising a casing having means for containing vaporizable fuel, a stopper for said means, said stopper having a nozzle orifice, a hollow holder adapted to co-act with said stopper to confine said nozzle orifice, means for the admission of air to said holder, a catalytic element supported by said holder in the path of vapor issuing from said nozzle orifice, removable closure means to enclose said catalytic element and air admission means, a cover for said nozzle orifice that is urged away therefrom when the lighter is in service, and means, carried by said closure means, adapted in the closing operation, to cause said cover to be applied to said nozzle orifice.

4. A lighter comprising a casing, a container for vaporizable fuel removably fitted in said casing, said container having an open end, a stopper removably engaging said open end, to close it, said stopper having a nozzle orifice at one end and having at its other end means for engaging a capillary member that is to convey fluid from the container to said nozzle orifice, a wall surrounding said nozzle orifice, said wall having air admission means and enclosing a mixing chamber, a catalytic element, and a hollow holder adapted to co-act with said stopper to confine said chamber, said holder supporting said catalytic element in the path of vapor from said nozzle orifice.

5. A lighter comprising a container for vaporizable fuel, said container having an open end, a stopper removably engaging said open end, to close it, said stopper having an upwardly directed nozzle that is provided with an orifice, means engaged with said stopper to convey fuel to said orifice, a wall surrounding said nozzle, said wall having air admission means and enclosing a mixing chamber, a catalytic element, a hollow holder adapted to co-act with said stopper to confine said chamber, said holder supporting said catalytic element in the path of vapor from said nozzle orifice, and removable closure means to enclose said catalytic element and air admission means.

6. A lighter comprising a container for vaporizable fuel, said container having an open end, a stopper removably engaging said open end, to close it, said stopper having an upwardly directed nozzle that is provided with an orifice, means engaged with said stopper to convey fuel to said orifice, a wall surrounding said nozzle, said wall having air admission means and enclosing a mixing chamber, a catalytic element, a hollow holder adapted to co-act with said stopper to confine said chamber, the wall of said holder having air admission means and being spaced from said stopper wall, said holder supporting said catalytic element in the path of vapor from said nozzle orifice, and removable closure means to enclose said catalytic element and air admission means.

7. A lighter comprising a container for vaporizable fuel, a stopper for said container, said stopper having fuel emission means, a catalytic element, means for supporting said catalytic element in the path of vapor issuing from said

emission means, removable closure means to enclose said catalytic element, a cover for said fuel emission means that is urged away therefrom when the lighter is in use, and means, carried by said closure means, adapted in the closing operation to cause said cover to be applied to said fuel emission means.

8. A lighter comprising a casing, a partition therein defining a vaporizable fuel container in one end thereof and a mixing chamber in the other end, a catalytic element supported in the last mentioned end of said casing forming a wall of said mixing chamber, a nozzle having an orifice communicating with said fuel container, said nozzle being of small cross section at the orifice end thereof and projecting into said mixing chamber from said partition, and air admission means communicating with said mixing chamber below said nozzle orifice whereby removal of vapor mixture from said mixing chamber through said catalytic element creates a draft of air past said nozzle orifice to draw fuel into said mixing chamber.

9. A lighter comprising a casing, a partition therein defining a vaporizable fuel container in one end thereof and a mixing chamber in the other end, a catalytic element supported in the last mentioned end of said casing forming a wall of said mixing chamber, a tapered nozzle projecting into said mixing chamber from said partition and having a nozzle orifice communicating with said fuel container, air admission means communicating with said mixing chamber near the base of said nozzle whereby removal of vapor mixture through said catalytic element creates a draft of air past said nozzle orifice to draw fuel into said mixing chamber.

10. A lighter comprising a casing, a partition therein defining a vaporizable fuel container in one end thereof and a mixing chamber in the other end, a catalytic element supported in the last mentioned end of said casing forming a wall of said mixing chamber, a nozzle formed integral with said partition and projecting into said mixing chamber, said nozzle having an orifice communicating with said fuel container, and air admission means communicating with said mixing chamber near the base of said nozzle, said nozzle and the adjacent walls of said mixing chamber being of a shape to direct a draft of air past said nozzle orifice when the vapor mixture in said mixing chamber is removed through said catalytic element to draw fuel through said nozzle orifice into said mixing chamber.

11. A lighter comprising a casing, a partition

therein defining a vaporizable fuel container in one end thereof and a mixing chamber in the other end, a catalytic element supported in the last mentioned end of said casing forming a wall of said mixing chamber, a nozzle having an orifice communicating with said fuel container, said nozzle being of small cross section at the orifice end thereof and projecting into said mixing chamber from said partition, air admission means communicating with said mixing chamber below said nozzle orifice whereby removal of vapor mixture from said mixing chamber through said catalytic element creates a draft of air past said nozzle orifice to draw fuel into said mixing chamber, a removable closure means to cover said catalytic element and said air admission means, and means to close said nozzle orifice when said removable closure means is positioned to enclose said catalytic element and said air admission means.

12. A lighter comprising a container for vaporizable fuel, a stopper in the end of said container, a catalytic element, means to support said catalytic element on said container and to cooperate with said stopper and said catalytic element to form a mixing chamber therebetween, a nozzle on said stopper projecting into said mixing chamber and having a nozzle orifice communicating with means to convey fuel from said container to said orifice, and air admission means communicating with said mixing chamber below said nozzle orifice, said nozzle and the adjacent walls of said stopper being shaped to direct a draft of air past said nozzle orifice to draw fuel into said mixing chamber when the vapor mixture in said mixing chamber is removed through said catalytic element.

13. A lighter comprising a container for vaporizable fuel, a stopper in the end of said container, a catalytic element, means to support said catalytic element on said container spaced from said stopper, a flange on said stopper cooperating with said catalytic element to form a mixing chamber between said catalytic element and said stopper, a tapered nozzle made integral with said stopper projecting into said mixing chamber and having a nozzle orifice communicating with means to convey fuel from said container to said orifice, and air admission means in said flange communicating with said mixing chamber near the base of said nozzle whereby removal of vapor mixture through said catalytic element creates a draft of air past said nozzle orifice to draw fuel into said mixing chamber.

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