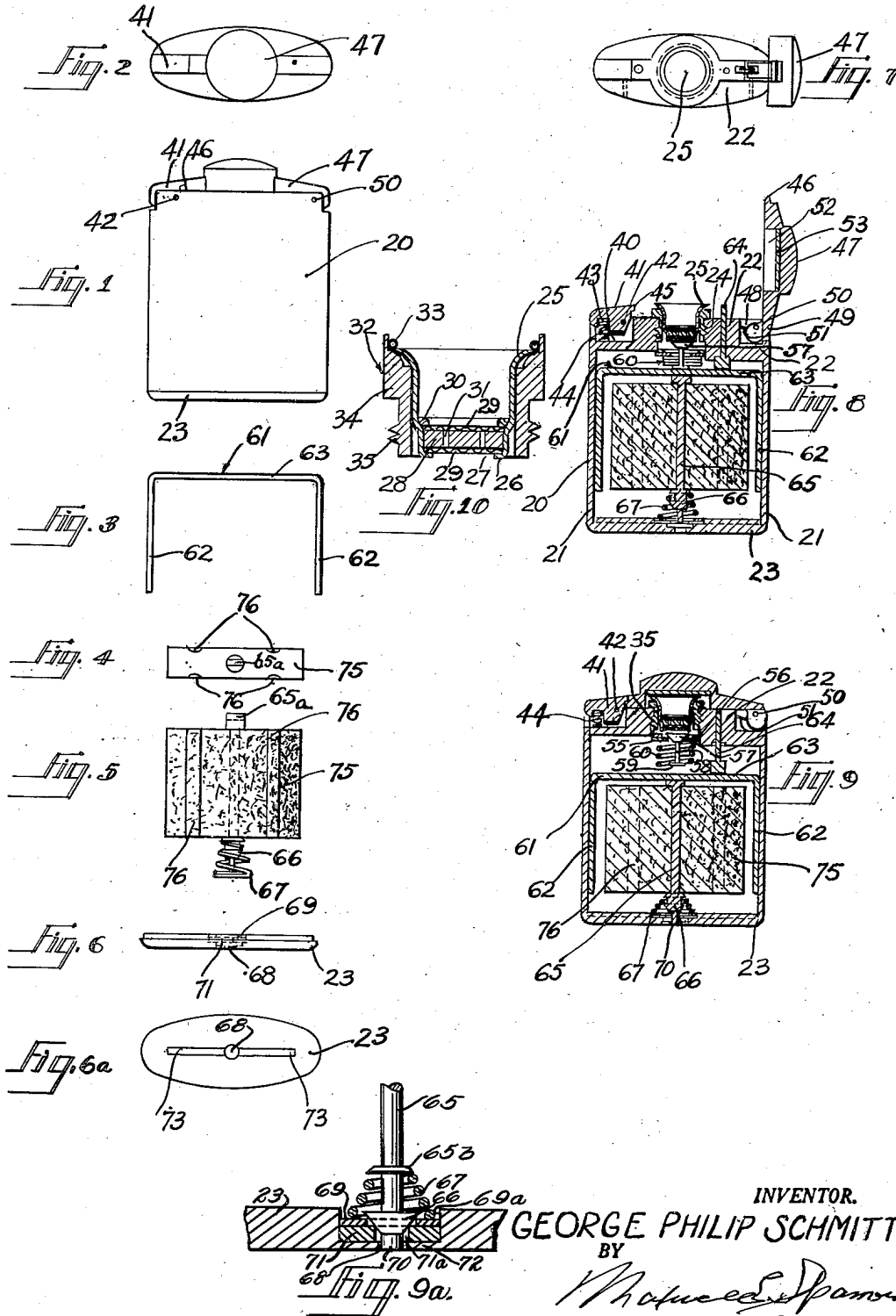


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CATALYTIC LIGHTER

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CATALYTIC LIGHTER

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This invention relates to improvements in cigarette or like catalytic lighters wherein a pill made of spongy platinum or similar catalytic substance is made to coact with the vapor of alcohol or similar vaporizable liquid in the presence of atmospheric air, as to render such catalyst incandescent.

It is an object of the present invention to provide a lighter of the catalytic type wherein the lighter is placed in operable condition by the automatic flipping open of the cover.

It is another object of the present invention to provide a lighter of the catalytic type wherein the swinging of the lid is automatically effected by the releasing of a locking device under spring action.

It is a further object of the present invention to provide a catalytic lighter for cigarettes or the like wherein both the air admission valve and the valve through which the air charged vaporizable fuel is admitted to the catalyst are controlled by operation of the lid.

A still further object of the present invention is to provide novel mechanism cooperating with the lid to effect the aforementioned controllability of the said valves.

A catalytic lighter made in accordance with this invention has a catalyst unit set in the top of the casing and a fuel admission valve held normally closed by the action of a spring, the stem of the valve extending within the casing, said lighter being characterized in that there is provided within the casing a slidable inverted U-shaped member or the like contacting an air admission valve device held open by the action of a spring, the legs of the member being guided by the side walls of the casing and the member being retracted against the tension of the latter spring by a pin slidable in the said top and in contact with the member, by the closing of the lid; and upon opening of the cover the said member being urged upwardly by release of the tension on the latter spring, opening the air admission valve and depressing the first-mentioned spring thereby opening the fuel valve to permit the air-charged fuel to reach the catalyst. Upon closing the lid thereby depressing the U-shaped member, tension on the fuel valve spring is released and the fuel valve closes.

Other objects and advantages will be in part obvious from the annexed drawings and in part hereinafter indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and

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in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

In the drawings:

Fig. 1 is a side view of a catalytic lighter made in accordance with the invention;

Fig. 2 is a top view thereof;

Fig. 3 is a view of an inverted U-shaped member employable in the invention;

Fig. 4 is a top view of Fig. 5;

Fig. 5 is a side view of an air admission valve device carrying a wick or fuel reservoir;

Fig. 6 is a side view of the bottom element;

Fig. 6a is a bottom view of Fig. 6;

Fig. 7 is a top view of the lighter with the lid in open position;

Fig. 8 is a vertical sectional view of the lighter with the lid open, the valves being seen in open positions;

Fig. 9 is a view similar to Fig. 8, with the lid and the valves in closed positions;

Fig. 9a is a detail sectional view of the lower portion of Fig. 9;

Fig. 10 is a vertical sectional view of a catalyst unit employable in the invention.

Referring now more particularly to the drawing there is disclosed a casing 20 having side walls 21 a top 22 and a removable bottom 23. Top 22 has a central threaded opening 24 which threadedly engages the catalyst unit shown in Fig. 10. This catalyst unit may comprise an outwardly flared cup or ferrule 25 reduced at its lower end and the bottom 26 which is provided with an opening 27 for the passage of the air-charged fuel to the catalyst 28 disposed in said reduced portion and interposed between two screen elements 29, the lower one of which rests on bottom 26. A retainer ring 30 holds the catalyst 28 and screen elements 29 in place. The catalyst 28 may be provided with a plurality of perforations 31. The cup or ferrule 25 is held in a holder 32 by the retainer ring 33. Holder 32 has a flanged portion 34 which rests on the top 22 and a threaded portion 35 which engages the threaded opening 24 of casing 20.

The top 22 of casing 20 is provided with a recess 40 within which projects a finger piece 41 pivoted to the side walls of the recess as indicated at 42. Set in a recess 43 in finger piece 41 and bearing against recess 40 in top 22 is a helical spring 44. It is evident that finger piece 41 may be rocked about its pivot 42 and when depressed will be urged back to its original position by spring 44. Finger piece 41 has a projection or latch 45 adapted to overlie and en-

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gage the recessed forward end 46 of lid or cover 47 when the latter is in closed position. Top 22 of casing 20 has a recess 48 to the lateral walls of which is pivoted the opposite end 49 of lid 47 as indicated at 50. Lid 47 is urged to an open position by spring 51 retained in recess 48. Thus, it is evident that by pressing down of finger piece 41, lid 47 will be released therefrom and flip open; and when the lid is manually closed with a little pressure, tip or end 46 of lid 47 will depress latch 45 until tip 46 is caught thereunder.

Below cup 25 and held in place by a washer 55 is a valve seat 56, made of rubber or suitable composition material, for valve head 57. Valve stem 58 has an enlarged end 59 and between washer 55 and end 59 is disposed a helical spring 60. It is evident that spring 60 normally maintains valve head 57 against valve seat 56. Although one form of catalyst unit and valve construction has been shown herein, it is understood that any other suitable construction may be employed. Lid 47 has a recess 52 within which is disposed a suitable seal 53 which bears against the flared rim of cup 25 when the lid is in closed position.

Within casing 20 is disposed a relatively thin element 61 preferably in inverted U-shaped form having its legs 62 in slidable engagement with the internal walls of the sides of the casing. Bearing against the upper face of the cross member 63 of element 61 is the enlarged end of a pin 64 slidable in a bore in top 22 of casing 20 and engageable with lid 47 in closing position of the latter.

The cross member 63 of element 61 is in engagement with the slot of enlargement 65a of stem 65 of the air admission valve; said valve having a valve head 66. A helical spring 67 has its upper portion encircling stem 65 below flange or stop 65b, the lower end of helical spring 67 bearing against washer 69 in recess 69a of bottom 23. Valve head 66 has a projection 70 fitting into an opening 71a which is formed in the valve seat 71 for valve head 66. Valve seat 71 rests on part 72 of bottom 23. The bottom 23 has an opening 68 receiving the end of projection 70. Grooves or channels 73 connect with opening 68 through which when valve 66 is open, atmospheric air may be admitted into the casing for admixture in the casing with the fuel vapor therein. Valve stem 65 carries the fuel reservoir 75 which may be made of absorbent or liquid fuel-retaining or fuel-containing material. Reservoir 75 may be provided with grooves or channels 76 for passage of the air-fuel mixture.

As lid 47 is closed, pin 64 is forced downward, thus pushing element 61 in downward direction against the action of spring 67. By this action the air admission valve is closed and the fuel valve stem 58 is released from element 61 thereby allowing spring 60 to expand and close the fuel valve. When the lid is flipped open, pressure on pin 64 is released and spring 67 pushes air admission valve head 66 from valve seat 71, thus allowing air to enter the casing, and the valve stem 65 of the air admission valve is pushed upward by element 61 thus unseating valve head 57.

If the tip of a cigarette or the like is now placed in cup 25 and drawn upon by the smoker, air will be drawn up through the air admission valve, mix with the fuel vapor in the casing and the air and fuel mixture will contact the catalyst causing the latter to become incandescent by catalytic action. The lighter may be filled with

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fuel by unscrewing holder 32 and pouring liquid fuel through the opening.

It is thus seen that the present invention comprises simple and practical lighters which will be safe, efficient, and reliable in use and operation. The device comprises relatively few parts which may be inexpensively manufactured and assembled and which is well adapted to accomplish, among others, all of the objects and advantages herein set forth.

Without further analysis the foregoing will so fully reveal the gist of the invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that from the standpoint of the prior art fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A lighter comprising a casing provided with a top having an opening therein, a catalyst unit removably secured in said opening, spring controlled valve means operable in said casing below said unit, a slidable member in said casing engageable with said valve means when urged upwardly, a stem in engagement with said member, spring means in said casing for urging said stem and thereby said member upwardly, a lid for said casing, spring means urging said lid to open position, a spring operated finger-piece pivoted in said top normally holding said lid closed and adapted to release said lid when being pressed downwardly, a pin slidable in said top and projecting thereabove and therebelow, said pin being in contact with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said pin against the action of said spring means, a fuel reservoir in said casing carried by said stem, a removable bottom for said casing, air admission means in said bottom, and valve means controlling said air admission means and comprising a valve head on said stem and a valve seat carried by said bottom.
2. A lighter comprising a casing provided with a top having an opening therein, a catalyst unit removably secured in said opening, spring controlled valve means operable in said casing below said unit, a slidable member in and guided by said casing and engageable with said valve means when urged upwardly, a stem in engagement with said member, spring means in said casing for urging said stem and thereby said member upwardly, a lid for said casing, spring means urging said lid to open position, a spring operated finger-piece pivoted in said top normally holding said lid closed and adapted to release said lid when being pressed downwardly, a pin slidable in said top and projecting thereabove and therebelow, said pin being in contact with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said pin against the action of said spring means, a removable bottom for said casing, air admission means in said bottom, valve means controlling said air admission means and comprising a valve head on said stem and a valve seat carried by said bottom.
3. A lighter comprising a casing provided with a top having an opening therein, a catalyst unit

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removably secured in said opening, spring controlled valve means operable in said casing below said unit, a slidable member in said casing engageable with said valve means when urged upwardly, a stem engageable with said member, spring means in said casing for urging said stem and thereby said member upwardly, a lid for said casing, a pin slidable in said top and projecting thereabove and therebelow, said pin being in contact with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said pin against the action of said spring means, a fuel reservoir in said casing carried by said stem, a removable bottom for said casing, air admission means in said bottom, and valve means controlling said air admission means and comprising a valve head on said stem and a valve seat carried by said bottom.

4. A lighter comprising a casing provided with a top having an opening therein, a catalyst unit removably secured in said opening, spring controlled valve means operable in said casing below said unit, a slidable member in said casing engageable with said valve means when urged upwardly, a stem in engagement with said member, spring means in said casing for urging said stem and thereby said member upwardly, a lid for said casing, a pin slidable in said top and projecting thereabove and therebelow, said pin being in contact with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said pin against the action of said spring means, a bottom for said casing, air admission means in said bottom, and valve means controlling said air admission means and comprising a valve head on said stem and a valve seat carried by said bottom.

5. A lighter comprising a casing provided with a top having an opening therein, a catalyst unit removably secured in said opening, spring controlled valve means operable in said casing below said unit, a slidable member in said casing engageable with said valve means when urged upwardly, a stem in engagement with said member, spring means in said casing for urging said stem and thereby said member upwardly, a lid for said casing, spring means urging said lid to open position, a spring operated finger-piece pivoted in said top normally holding said lid closed and adapted to release said lid when being pressed downwardly, a pin slidable in said top and projecting thereabove and therebelow, said pin being in contact with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said pin against the action of said spring means, air admission means, and valve means within said casing controlling said air admission means.

6. A lighter comprising a casing provided with a top having a catalyst unit, spring controlled valve means operable in said casing below said unit, a slidable member in said casing engageable with said valve means when urged upwardly, a stem in engagement with said member, spring means in said casing for urging said stem and thereby said member upwardly, a lid for said casing, a pin slidable in said top and projecting thereabove and therebelow, said pin being in contact with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said pin against the action of said spring means, air admission means for admitting air into said casing, and valve means in said casing controlling said air admission means.

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7. A lighter comprising a casing provided with a top having a catalyst unit, spring controlled valve means operable in said casing below said unit, a slidable member in said casing engageable with said valve means when urged upwardly, a stem in engagement with said member, spring means in said casing for urging said stem and thereby said member upwardly, a lid for said casing, spring means urging said lid to open position, a spring operated finger-piece pivoted in said top normally holding said lid closed and adapted to release said lid when being pressed downwardly, a pin slidable in said top and projecting thereabove and therebelow, said pin being in contact with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said pin against the action of said spring means, air admission means for admitting air into said casing, and valve means in said casing controlling said air admission means and comprising a valve head on said stem and a valve seat carried by said bottom.

8. A lighter comprising a casing provided with a top having a catalyst unit, spring controlled valve means operable in said casing below said unit, a slidable member in said casing engageable with said valve means when urged upwardly, spring controlled means in said casing for urging said member upwardly, a lid for said casing, a pin slidable in said top and projecting thereabove and therebelow, said pin being contactable with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said pin against the action of the spring in said spring controlled means, air-admission means for admitting air into said casing, and valve means operable by said spring controlled means for controlling said air-admission means.

9. A lighter comprising a casing provided with a top having a catalyst unit, spring controlled valve means operable in said casing below said unit, a reciprocable member in said casing engageable with said valve means, spring controlled means in said casing for urging said member upwardly, a lid for said casing, an element slidable in said top and projecting thereabove and therebelow, said element being in contact with said member and contractable by said lid by the closing thereof whereby said member is moved downward by said element against the action of said spring controlled means, and means for admitting air into said casing.

10. A lighter comprising a casing provided with a top having a catalyst unit, spring controlled valve means operable in said casing below said unit, a reciprocable slidable member in said casing engageable with said valve means, spring controlled means in said casing for urging said member upwardly, a lid for said casing, spring means urging said lid to open position, a spring operated finger-piece pivoted in said top normally holding said lid closed and adapted to release said lid when being pressed downwardly, an element slidable in said top and projecting thereabove and therebelow, said element being in contact with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said element against the action of said spring controlled means, and means for admitting air into said casing, and valve means in said casing for controlling said air-admission means.

11. A lighter comprising a casing provided with a top having a catalyst unit, spring controlled valve means operable in said casing below said

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unit, a reciprocable member in said casing engageable with said valve means, spring controlled means in said casing for urging said member upwardly, a lid for said casing, an element slidable in said top and projecting thereabove and therebelow, said element being in contact with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said element against the action of said spring controlled means, and means for admitting air into said casing, said air admitting means being controllable by said spring controlled means.

12. A lighter comprising a casing provided with a top having a catalyst unit, spring controlled valve means operable in said casing below said unit, a reciprocable slidable member in said casing engageable with said valve means, spring controlled means in said casing for urging said member upwardly, a lid for said casing, spring means urging said lid to open position, a spring operated finger-piece pivoted in said top normally holding said lid closed and adapted to release said

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lid when being pressed downwardly, an element slidable in said top and projecting thereabove, said element being in contact with said member and contactable by said lid by the closing thereof whereby said member is moved downward by said element against the action of said spring controlled means, means for admitting air to said casing, and valve means in said casing for controlling said air-admission means, said valve means being controllable by said spring controlled means.

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