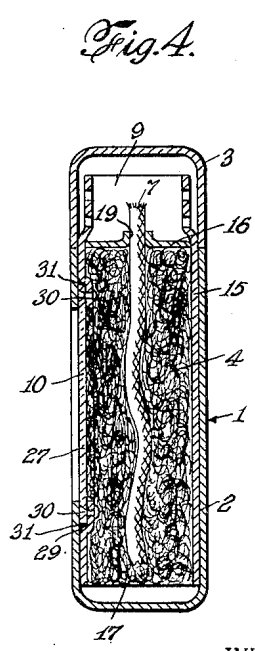
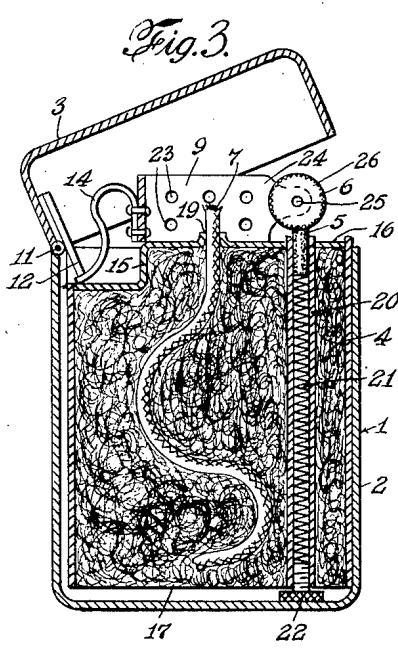
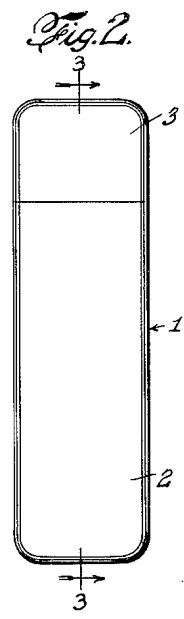
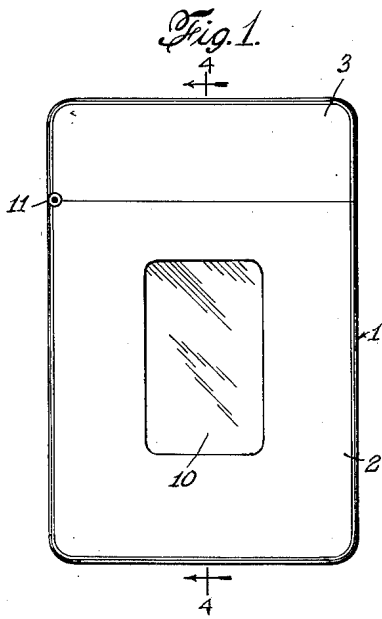


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# UNITED STATES PATENT OFFICE

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## CIGARETTE LIGHTER

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2 Claims. (Cl. 67-7.1)

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This invention relates to pyrophoric cigarette lighters for igniting cigarettes, cigars, pipes and the like in which a liquid fuel is utilized, and relates more particularly to a novel improvement in such lighters in which an indication is given as to the fuel supply therein.

In pyrophoric lighters, it is often difficult to ascertain the amount of fuel supply stored therein. This is particularly the case when the fuel is retained in its container by being held within the capillaries of cotton or other suitable absorbent material. In such lighters the absorbent material is generally almost completely enclosed in an outer container, and, even if it were visible, it would be difficult to ascertain whether or not fuel were present therein. This is a disadvantage of such lighters as often the fuel supply becomes exhausted when the user of the lighter is away from a supply of fuel and thus the lighter becomes useless until refilled.

The present invention aims to overcome the difficulties and disadvantages of prior devices by providing a lighter in which a visible indication of the fuel supply is available at all times.

Another object of the invention is to provide an improved pyrophoric lighter which is economical to manufacture, rugged in construction and effective in operation.

Another object of the invention is to provide means to visibly indicate the presence of a liquid.

Another object of the invention is to provide an improved pyrophoric lighter in which a visible indication of the fuel supply is available in which the construction involves no moving parts.

In accordance with the invention this is accomplished by providing in the fuel retainer of a pyrophoric lighter a viewing opening for observation of the absorbent material for the fuel which normally prevents the passage of sufficient light thereto so that its color may be observed, yet, when dampened becomes sufficiently transparent so that the color may be observed. Such a viewing opening or window may be of a transparent material which is etched or ground on its interior surface so that it is translucent or opaque when dry. The cotton or other absorbent material to hold the fuel supply is of a color which is not bright enough to show through the translucent or opaque window when the surface of the window is dry, but which is easily visible when the surface is moistened by the fuel carried by the absorbent material.

The invention is advantageous not only in indicating the presence of fuel, but also in indicating the proportionate amount of fuel present

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inasmuch as when the fuel becomes low a gradual indication thereof is given by the appearance of white spots on the translucent or opaque window.

Other objects and advantages of the invention will be apparent from the following description and from the accompanying drawing which shows, by way of example, an embodiment of the invention.

Fig. 1 is an elevational view of a pyrophoric lighter in accordance with the invention.

Fig. 2 is an end view of the lighter.

Fig. 3 is a vertical sectional view of the lighter in a partially opened position taken along the line 3-3 of Fig. 2.

Fig. 4 is a vertical sectional view of the lighter taken along the line 4-4 of Fig. 1.

Referring to the drawing there is shown a pyrophoric lighter 1 in accordance with the invention. The lighter comprises generally a casing 2 having a hinged cover 3 providing an enclosure for the operating mechanism which includes an absorbent material 4, a pyrophoric material or element 5, a spark wheel 6 for the pyrophoric material 5, a wick 7 and a wind guard 9. The case 2 is further provided with a portion of transparent material or window 10 for viewing an indication of the fuel supply.

The casing 2 may be made of any suitable material to enclose the operating mechanism of the lighter. The cover 3 is attached to the casing 2 by a hinge 11. A "kicker" member 12 coacts with a spring 14 attached to one side of the wind guard 9 to retain the cover 3 in either the closed or open position.

The operating mechanism of the lighter is supported within the case 2 by a housing 15. The housing is formed to fit within the case 2 and has a closed top 16 and an open bottom 17. The wick 7 extends through an aperture 19 in the top 16 of the housing 15. A tube 20 for the pyrophoric element 5 also extends through the top of the housing 15 at one side thereof. Within the tube 20 is a spring 21 adapted to urge the pyrophoric material 5 upwardly against the spark wheel 6. The bottom of the spring abuts against a screw plug 22 threaded into the lower end of the tube 20.

The wind guard 9 is a U-shaped member having its side walls perforated as indicated at 23 and attached to the top 16 of housing 15 by soldering or the like. Ends 24 of the wind guard 9 are perforated to receive a shaft 25 on which is mounted the spark wheel 6. The shaft 25 may be held in position by riveting over the ends thereof or by other suitable means.

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The spark wheel 6 is formed with a serrated edge 26 adapted to frictionally contact the pyrophoric member 5 and thereby produce sparks which are thrown against the end of the wick 7 to ignite the fuel.

The absorbent material 4 may be cotton or other suitable material of a color as herein-after described and is packed into the open bottom of the housing 15 with the wick 7 embedded therein. The absorbent material 4 is adapted to hold liquid fuel such as the usual lighter fluid within its capillaries and thus supply the wick 7 with the fuel.

In accordance with the invention visible means for indicating the fuel supply is provided. This means includes a window or viewing opening formed of a material which, when dry, prevents the passage of sufficient light from the front thereof through to the absorbent material so that the color of the absorbent material may be observed. However, the material of which the window is formed is such that, when dampened, sufficient light may pass there-through and be reflected back from the surface of the absorbent material so that its color may be observed. In the embodiment illustrated in the drawing, a window material 27 is mounted in an opening 29 in the sidewall of the housing 15. The window is made of a transparent material 27 which has been etched or ground on its inner surface to give a frosted effect and to provide a light diffusing surface normally translucent or opaque, but which becomes transparent when moistened. Other methods may be used for producing the window with a surface giving a frosted effect such as by sand-blasting or pebbling the transparent material. Other means of providing such a window may be utilized such as by backing up a transparent surface with a thin sheet of paper or the like. The window material 27 may be retained in the opening 29 by a press fit, or may be more securely held as shown by rivets 30 inserted in perforations in the edge of the sidewall of the housing 15 adjacent the opening 29. Preferably the edges of the sidewall of the housing 15 are recessed at the edges of the opening as indicated at 31 to provide a smooth outer surface for the housing.

In order that the indication of the fuel supply operates at greatest effectiveness, it is preferable that the absorbent material 4 be of a color, or tinted by a color-fast dye, such that the color is not bright enough to show through the etched or ground glass surface when the surface is dry, but sufficiently bright to give an indication when the absorbent material is moistened by the presence of liquid fuel. The color is determined by experiment and is dependent upon the amount of etching or the degree of diffusion of light by the etched or ground surface.

One of the characteristics of a colored material is that it appears darker when wet, this characteristic being particularly noticeable in an absorbent colored material. This characteristic is utilized to advantage in the present invention. The colored absorbent material becomes darkened when moistened by fuel; fur-

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ther, the translucent window becomes transparent when it is moistened by the fuel, and thus an effective indication of the presence of fuel is given.

When the lighter is filled with the fuel the user will easily observe the color of the absorbent material showing through the window. As the fuel supply becomes gradually depleted, the user will observe white spots appearing in the bright colored area seen through the window and the colored areas will gradually grow lighter. When the entire window appears white the absorbent material will be almost dried out by reason of the absence of liquid fuel. Thus an indication is given indicating that the fuel supply is exhausted and making it impossible for the lighter to run out of fuel without a warning having been given.

While the invention has been described and illustrated with reference to a specific embodiment thereof, it will be understood that other embodiments may be resorted to without departing from the invention and modifications may be made in the structure involved. For instance, the outer casing 2 may be made entirely of transparent material, with the sidewalls of the housing 15 formed entirely of the etched transparent material 27, or in other constructions, the casing 2 may directly form the retaining means for the absorbent material 4 in which event the etched transparent material 27 would form part of, or the entire side wall of the casing. Therefore, the form of the invention set out above should be considered as illustrative and not as limiting the scope of the following claims.

I claim:

1. In a pyrophoric lighter, a housing, colored absorbent material in the housing, a wick, a pyrophoric element, a spark wheel for frictionally engaging the pyrophoric element, a transparent material forming at least a portion of the sidewall of the housing, and a sheet of absorbent paper between said transparent material and said absorbed material.

2. In a pyrophoric lighter, a housing, absorbent material in the housing, a wick, a pyrophoric element, a spark wheel for frictionally engaging the pyrophoric element, a transparent material forming at least a portion of the side wall of the housing, a thin backing to the transparent material, of translucent absorbent material which changes appearance when wet.

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