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## WICK STRUCTURE IN LIGHTER

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3 Claims. (Cl. 67-7.1)

This invention relates to wick structure in lighter employing liquid fuel and pyrophoric sparking means.

The main objects of this invention are:

First, to provide a lighter of this character which produces a steady uniform flame, does not leak and conserves fuel.

Second, to provide a lighter which eliminates the use of cotton or other absorbent material in the fuel chamber.

Third, to provide a lighter having these advantages which may be economically produced.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined in the claims.

A structure which embodies the features of the invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is a side elevational view of a lighter embodying the invention, parts being vertically sectioned and broken away to illustrate structural details and the relation of parts.

Fig. 2 is a horizontal section on a line corresponding to line 2-2 of Fig. 1.

Fig. 3 is an exploded view of the wick holder and associated parts, the fuel feed wick being partially broken away.

In the embodiment of the invention illustrated the casing 1 is chambered to provide a liquid fuel reservoir, the fuel being indicated at 2. The holder 3 for the pyrophoric element 4 is mounted on the base to project upwardly through the top 5, the pyrophoric element being yieldingly urged against the sparking wheel 6 by means of the coiled spring 7. The wheel 6 is rotatively mounted on the pivot 8 and is rotated by the handpiece 9. The structural details of this sparking mechanism form no part of the invention and therefore are not illustrated or described in further detail. The member 9 is provided with a snuffer 10. The applicant is aware that structures embodying these parts generally considered are old in the art.

The wick holder 11 is provided with a longitudinal bore 12 extending from end to end thereof. The wick holder has a reduced lower portion 13 seated in a flanged opening 14 provided therefor in the cover 5. A flame wick 16 is inserted in the upper end of the holder 11 to project therefrom, this flame wick being supported by the holder in proper relation to the spark producing means. The feed wick 17 is inserted in the lower end of the holder member and retained therein, desirably by crimping the lower edge of the holder member upon the feed wick as is shown at 18. The feed wick is desirably of such length that its lower end rests upon the bottom of the casing, the purpose of this being to feed fuel as long as there is any in the casing.

A fuel metering element 19 is arranged in the holder between the flame and feed wicks with its ends in abutting contact therewith. This element or member 19 is preferably a piece of wood, such as birch, and is dimensioned to fit within the bore of the holder so that sub-

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stantially all fuel delivered to the flame wick must pass through the metering element rather than around it. It will be understood that the feed wick, flame wick and metering element are all capillary elements. The feed and flame wicks are desirably of asbestos or like non-combustible material. They are shown conventionally in the accompanying drawing. In operation, the metering element 19 absorbs liquid fuel by capillary action from the end of the feed wick against which it is abutted. In so doing, the fibres of the metering wick are wetted and expanded into tighter engagement with the walls of the holder 11 until the capillary passages of the metering wick are closed off and no more fuel will be absorbed. The metering wick thus acts as a valve to shut off flow of fuel until part of the fuel in the metering wick is removed by being absorbed into the burning wick 16 as by being supplied to the flame supported by the burning wick.

The bottom of the casing is provided with a filling plug 20 and in the embodiment illustrated the tubular sparking element holder 3 is inserted through an opening 21 in the bottom of the casing and supported therein by the threaded closure 22. The upper end of the holder 3 projects through the top of the casing. It will be understood that the bottom, top, side walls, closures and holder 11 have liquid-tight connections with their associated parts.

While this invention could be embodied in a lighter in which the reservoir is provided with cotton or like material, such material is entirely unnecessary in the structure of this invention, and the full capacity of the reservoir and casing can be utilized. Also, the lighter can be shaken to determine whether there is liquid fuel therein. As an example, the bore of the holder member 11 may be five-sixteenths of an inch in diameter, and the metering element 19, which as stated is a close fit therein, may desirably be approximately one-fourth of an inch in length. This results in a uniform flame, regardless of the amount of fuel in the reservoir. Fuel is conserved and applicant estimates that there is substantially a 50% saving in fuel. The details of the spark producing means are unimportant so long as they are efficient and properly associated with the projecting end of the flame wick. I have not attempted to illustrate or describe various other adaptations which may be made and which I contemplate such as variations in shape of casing and the like.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A lighter of the class described comprising a casing constituting a liquid fuel reservoir, a manually operable spark producing means carried by said casing, a tubular wick holder mounted on said casing to project therefrom to support a flame wick member in operative relation to said spark producing means, a flame wick disposed within the upper end of said wick holder to project therefrom in operative relation to said spark producing means, a feed wick disposed within the casing with its upper end projecting into and secured within said wick holder, and a metering wick element of hard wood disposed between the ends of said feed and flame wicks with its ends in abutting contact therewith, the metering element being exteriorly conformed to fit within said wick holder member and being approximately one-fourth of an inch in length and approximately five-sixteenths of an inch in diameter, the grain of the wood of said metering element extending lengthwise thereof.

2. A lighter of the class described comprising a casing constituting a liquid fuel reservoir, a manually operable spark producing means carried by said casing, a tubular wick holder mounted on said casing to project therefrom to support a flame wick member in operative relation to said spark producing means, a flame wick disposed

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within the upper end of said wick holder to project therefrom in operative relation to said spark producing means, a feed wick disposed within the casing with its upper end projecting into and secured within said wick holder, and a metering wick element of hard wood disposed between the ends of said feed and flame wicks with its ends in abutting contact therewith, the metering element being exteriorly conformed to fit within said wick holder member.

3. A lighter of the class described comprising a casing 10 constituting a fuel reservoir, a spark producing and snuffer means carried by said casing, a tubular wick holder mounted on said casing and positioned to support a flame wick member in operative relation to said spark producing means, a flame wick disposed in said holder to project 15 from the upper end thereof, a feed wick disposed within the casing and extending to the bottom thereof, the upper end of the feed wick extending a substantial distance into the wick holder, and an intermediate wick element

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of wood disposed within the wick holder with its ends in abutting contact with adjacent ends of the feed and flame wicks, said intermediate wick element being externally conformed and sized to tight sealing engagement with the walls of said holder and constituting a fuel feed metering element for said flame wick.

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