

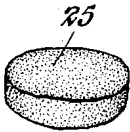
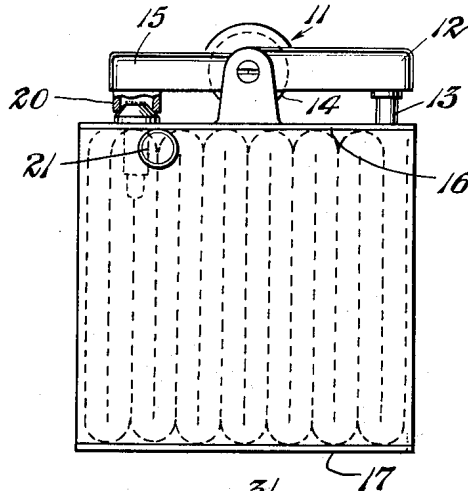
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H. C. QUARTIER  
SELF-WETTING WICK COMPOSITION

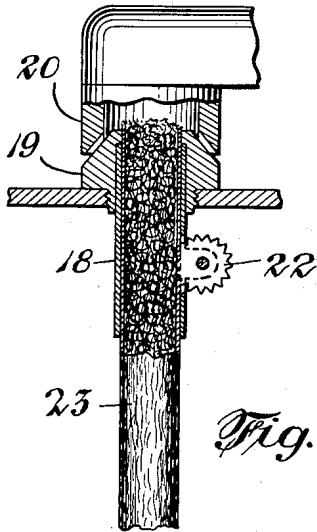
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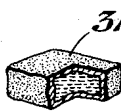
*Fig. 1.*



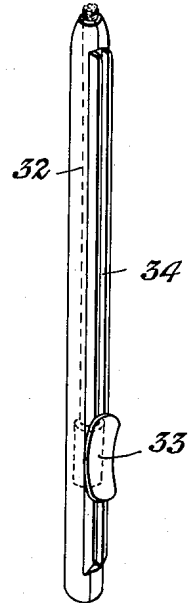
*Fig. 8.*



*Fig. 2.*

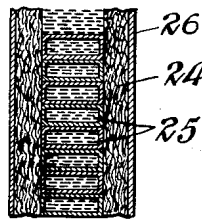


*Fig. 9.*

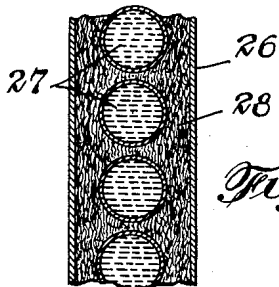
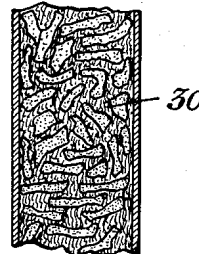


*Fig. 3.*

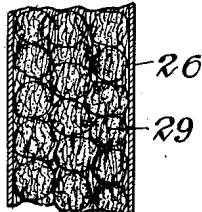
*Fig. 5.*



*Fig. 7.*



*Fig. 4.*



*Fig. 6.*

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**SELF-WETTING WICK COMPOSITION**

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19 Claims. (Cl. 67-7.1)

This invention relates to compositions of materials for use in wicks for pocket lighters, lamps, signals, candles, fuses, flares, heating pads, etc. More specifically, the invention comprises a novel and improved type of wick or fuse material including a controlled supply of hermetically sealed normally volatile or unstable fuel.

The main object of the invention is to provide a safe, economical composition of matter containing hermetically sealed cells of volatile fuel or unstable fuel ingredients or oxidizers for use in wicks, fuses, heating pads and the like.

Another object of this invention is to provide a safe and economical lighter having a wick which supplies the necessary fuel to maintain the fiber material in the wick saturated at the exposed end for immediate use, and eliminates the necessity for supplying and handling loose volatile fuel from sources outside the wick.

Another object is to provide a wick which supplies its own volatile liquid fuel to its exposed end.

Another object is to impregnate the wick with globules of fuel inclosed by hermetically sealed frangible membranes which are combustible and break upon approaching the flaming end of the wick as the wick is fed toward said end to maintain the flame.

Another object is to construct a wick providing its own source of fuel to maintain its exposed end saturated with fuel.

Another object is to provide a wick of fibrous material held in a hollow cylindrical form about a central space filled with a multiplicity of fuel compartments hermetically sealed and separated by a thin combustible material which breaks when heated by the approaching flame of the wick to successively release the enclosed fuel in the successive compartments into the adjacent fibrous material.

Another object is to provide a wick made of fibrous material mixed with minute hermetically sealed capsules of liquid fuel bound and held together by a thin combustible outer wall.

Another object is to make a self-wetting liquid fuel wick for general use, especially where external supply of the liquid fuel is not provided for or is wasteful or difficult to maintain.

Another object is to make an economical self-fueling wick incorporating a comparatively small proportion of absorbent matter with a predominant proportion of minute hermetically sealed frangible cells filled with volatile and/or unstable fuel ingredients when exposed to air.

Another object is to make the above composition in sheet form for cutting into wick strips, fuses, heating pads, etc. of any desired sizes or shapes without losing any significant amount of the fuel ingredients, because of the small size of the cells which might be cut open.

Another object is to provide a core for an underwater fuse including hermetically sealed cells for volatile and otherwise unstable fuel ingredients.

Other and more specific objects will become apparent

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in the following detailed description of the invention having reference to the accompanying drawing wherein:

Fig. 1 is an illustration of a popular form of lighter casing equipped with a self-fueling wick constructed in accordance with the present invention, and a common form of wick-feeding ratchet wheel,

Fig. 2 is an enlarged detailed sectional view of the end of the wick shown being fed through the nozzle sleeve by the ratchet wheel,

Fig. 3 is an illustration of the use of the present wick in a candle wick holder,

Figs. 4, 5, 6 and 7 illustrate several preferred forms of construction of the wick made in accordance with the present invention and,

Figs. 8 and 9 show two modifications of the shape of the hermetically sealed fuel compartments that may be used.

In Fig. 1 may be seen a popular form of lighter casing 10 and mechanism 11 having an operating lever 12 normally spring-pressed into its upper position by a spring enclosed in the spring housing 13 and having well known ratchet means for driving the flint wheel 14 and for raising the cap lever 15.

The casing 10 is provided with end walls 16 and 17 which may be held together in any known manner. The sleeve 18 is mounted in the wall 16 and has a nozzle 19 with a conical surface over which the cap 20 is normally held in a closed position. Casing 10 is provided with a bearing through which a feeding knob 21 is rotatably mounted and has a ratchet wheel 22 passing through the sleeve 18 for biting into the side of the wick 23. When the ratchet wheel 22 is operated, its sharp teeth may obviously pierce at least some of the adjacent cells of fuel in the wick, and will thus ensure the presence of some volatile fuel in the wick end for easy ignition even after long intervals of non-use.

The wick may be folded up into a block form the size of the casing so that it may be originally installed in the casing by removing the bottom thereof and starting its end into the sleeve 18 with the aid of the feeding knob 21. The bottom wall 17 may then be replaced, and the lighter will then be ready for use.

If the total volume of liquid fuel contained in all the fuel cells in the entire wick is substantially the same as a charge of liquid fuel that would be used in the present day lighter of the same size, the wick in the present instance would last for a considerably longer period of use before a new charge would be needed because it has been found that in present day lighters much of the fuel, which is necessarily volatile, is wasted by evaporation not only through the nozzle where the wick is exposed but also through leaks in the casing. This waste is avoided in the present form of the invention where only a very small portion of the total fuel, limited to the size of the individual globules or chambers, is ever wasted by evaporation between lightings, and that is only in case of a poor seal between the cap and nozzle of the wick sleeve. Thus the service period of one charge in the present invention will outlast the service period of one charge of fuel in the present day lighter by many times depending on the frequency of the use of the lighter and the size of the individual globules or cells.

The wick, which is composed of a fiber portion and a predominant fuel portion, may be formed in any number of different ways, and in some cases it might be desirable that the globules of liquid fuel mixed with the fiber material be compressed in a continuous cylindrical form of suitable size and held closely together by a thin outer wall made of the fiber or other combustible material. As the wick is burned, successive globules approaching the end of the wick will break and supply the necessary impregnation of a sufficient portion of the

fibers in the end of the wick with the released fuel to maintain a flame until the next globule is broken by the heat of the approaching flame. All of the material being combustible, the wick is burnt completely as it is fed at any suitably slow rate. However, if the fiber material is of a non-combustible nature, the fibers may be held by a binder which, when subjected to the flame at the end of the wick, will be loosened to release the loosened fibers as ashes, which will break away from the end of the wick.

Some of the forms in which the wick may be made, as illustrated in Figs. 4 to 7, include the cylindrical arrangement 24 of fibers having a central space filled with cylindrical globules 25 which may be individual or formed in one continuous cylindrical chain of compartments separated by common walls to form a succession of fuel spaces, the wick being held together by the outer cylindrical wall 26 of combustible material. Another form of wick may be made by surrounding a string of globular fuel chambers 27 by fibrous material held together by the outer wall 26 of combustible materials. A further modification of the wick may be made by mixing the fiber and minute fuel pellets or cells of any size into a substantially homogeneous mixture 29, then rolling it out to the size of the required wick and binding it together by the outer wall 26 as before. The pellets, of irregular shape, 30, as shown in Fig. 7, may be used in this mixture. Instead of the cylindrical form of pellet 25 a rectangular shape 31 may be used as shown in Fig. 9, for use in a correspondingly rectangular shaped core space within the fibrous cylinder shown in Fig. 5.

This form of wick is not limited in its use to wet lighters such as the common pocket lighters but may also be used in any lighting, heating, signalling or other device where an external supply of fuel to the wick is not available, convenient or economical. One example of such use is shown in Fig. 3 which illustrates a candle wick lighter having a holder 32 and a thumb-feed slide mechanism 33 which is fastened to the lower end of the wick, and may adjust the wick by moving the mechanism in its slot 34 in the side of the holder 32.

By using different flame coloring materials in the individual fuel cells or globules, various combinations of flame signals may be created in a flare or torch by using wicks comprising the desired color globule combination. The individual fuel compartments in each wick may be filled with fuel providing a different color in any succession desired.

The wick may also be used for singeing purposes instead of the common waxed wick, and will give better results because of its longer burning qualities and its adaptability to different requirements.

For use in fuses, the globules or cells may be filled with suitable fuels and oxidizers mixed in desired proportions, or the fuels and oxidizers may be in separate cells and the cells mixed in proper proportions and distributed in the fuse to provide a continuous glow or spark to travel at the desired rate in the core of the fuse when ignited.

In wicks for high altitude use, special fuels may be used to work more efficiently than those used at normal atmospheric pressures.

For maximum efficiency it would seem desirable, in an ordinary pocket lighter wick, to combine a maximum total volume of fuel with a minimum total amount of the fiber plus sealing material in the composition of the wick, only a sufficient amount of the latter material being required to maintain good capillarity in the exposed end of the wick where the vacated fuel spaces are filled by spreading of the surrounding fiber and sealing material as the released fuel is soaked up thereby. For other purposes, it may be desirable to have larger proportions of the fiber material in the composition.

Many obvious modifications in the form and structure of the wick as well as its application to various uses may

be made without departing from the spirit and scope of this invention as defined in the appended claims.

For example, the flame coloring material may be mixed with the fiber, or the fiber impregnated with flame coloring matter, instead of adding this flame coloring matter to the liquid fuel globules. Alternatively, the coloring material may be incorporated in the fuel sealing material.

Furthermore, this wick may be used in connection with external liquid fuel supply means, and will act in the same manner as the ordinary fiber wick, except that in the event the external supply is exhausted between charges, it will supply emergency fuel internally by advancing the wick, until the external charge can be replenished. For this purpose, the ratchet wheel for feeding the wick may be provided with teeth having sharp points long enough to pierce some of the globules in the wick to release enough fuel to make it reignite easily after it had been burnt dry. In this connection, ordinary dry or absorbent non-combustible wicks might be used in a fixed position to surround or be positioned alongside of the advanceable combustible wick presented herein whereby successive charges of combustible fuels released as excess to any periodic burning interval's requirements of the combustible wick might be stored through absorption into the adjoining non-combustible wick and thereby prevent the loss of such charges through leakage or immediate evaporation.

Figs. 4 to 7 amply illustrate sheet compositions in section, as well as axial sections of cylindrically or rectangularly formed wick formations, especially Figs. 6 and 7, which, as already mentioned, are more adaptable for cutting into strips or other shapes without significant loss of fuel in the cutting process, due to the comparatively small fuel cells.

What is claimed is:

1. A pocket lighter comprising a casing having a removable bottom wall and a fixed upper wall, a sleeve extending through said upper wall having a nozzle at its outer end, a wick feeding knob extending through said casing and having a ratchet wheel operating in a slot in said sleeve for feeding a wick passed therethrough, and a wick containing volatile liquid fuel hermetically sealed in said wick in a multiplicity of frangible cells distributed throughout the length of the wick for supplying the burning end of the wick with fuel thereby obviating the need of conventional freely flowing liquid fuel in the absence of the normal supply of free liquid fuel in said casing.

2. A wick comprising a mixture of fibrous material and hermetically sealed pellets of liquid fuel, said mixture being held together by a cylindrical wall of combustible material around the outside of the wick.

3. A wick as defined in claim 2 wherein said pellets are globular in form and have a thin wall of combustible material subject to breakage upon heating by the approaching flame of the wick as it is burned.

4. A wick as defined in claim 2 wherein said pellets are of irregular form and are of combustible material subject to breakage upon heating by the approaching flame of the wick as the wick is fed to maintain the flame.

5. A wick comprising a cylinder of fibrous material having a core of hermetically sealed liquid fuel pellets, and a cylindrical outer wall of fibrous combustible material holding said material closely about said core.

6. A wick as defined in claim 5 wherein said core is cylindrical and comprised of a column of individually sealed pellets.

7. A wick comprising a cylinder of fibrous material having a core of liquid fuel pellets, a flame coloring material mixed with said fibrous material, said material and core being held together by a cylindrical outer wall of fibrous combustible material.

8. A wick as defined in claim 7 wherein said pellets are enclosed by a thin wall of combustible material.

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9. A wick as defined in claim 8 where adjacent pellets have common separating walls comprising a continuous cylinder.

10. A wick as defined in claim 5 said core being of rectangular section, said pellets being correspondingly rectangular in section.

11. A wick as defined in claim 10, wherein adjacent pellets have common separating walls comprising a continuous rectangular core.

12. A wick comprising a fiber material impregnated with a succession of liquid fuel pellets of different color producing fuel arranged in a selected succession for producing a series of different colored flames as the wick is burned.

13. A wick composition comprising a substantially homogeneous mixture of fibres and minute globules of fuel hermetically sealed in thin walls breakable by heat from an approaching flame in said composition to release the enclosed fuel for saturation of the surrounding material to prolong the burning of the wick or increase its flame.

14. A wick composition as defined in claim 13 made in sheet form suitable for cutting into wick strips, fuses or heating pads of any size and shape.

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15. A fuse core composed of a suitable mixture of minute hermetically sealed cells of heat breakable material filled with different fuel ingredients and binding material holding the cells together.

16. A fuse core as defined in claim 15, said binding means including combustible fibrous material.

17. A fuse core as defined in claim 16, at least some of said fuel ingredients being volatile liquids.

18. A fuse core as defined in claim 17, some of said fuel ingredients being volatile liquids.

19. A pocket lighter as defined in claim 1, said volatile fuel being sealed in minute globules, said ratchet wheel having teeth with sharp points long enough to pierce some of said globules to release the fuel into said wick for facilitating ignition when the wick has become too dry.

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