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H. L. FISCHER ET AL

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LIGHTER WITH REPLACEABLE FUEL CARTRIDGE

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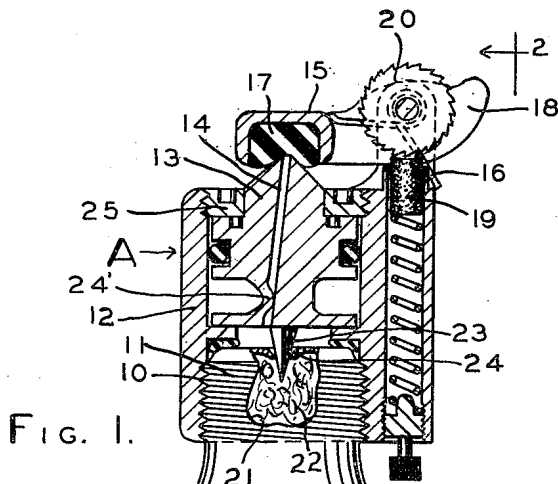


FIG. 1.

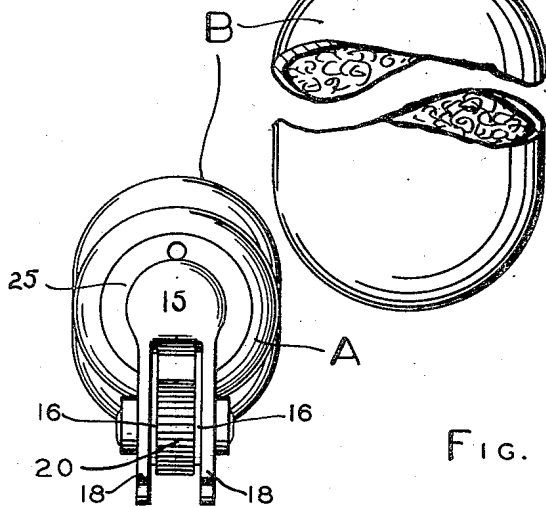


FIG. 2.

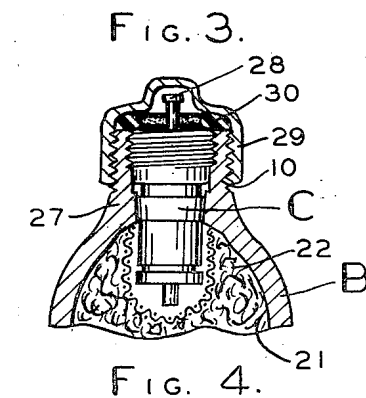


FIG. 3.

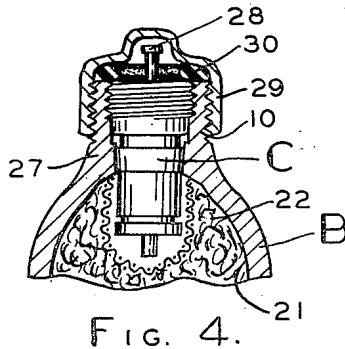
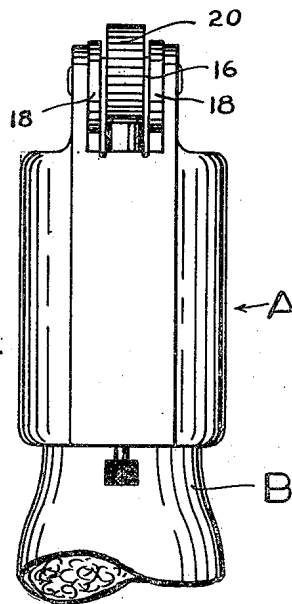


FIG. 4.



Inventor  
HOWARD L. FISCHER  
JACK W. WICKS

*Howard Fischer*  
Attorney

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**LIGHTER WITH REPLACEABLE FUEL CARTRIDGE**

Howard L. Fischer and Jack W. Wicks, St. Paul, Minn., assignors to Brown & Bigelow, St. Paul, Minn., a corporation of Minnesota

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4 Claims. (Cl. 67-7.1)

This invention relates to a simple ignition lighter mechanism which can be attached to a cartridge containing a liquified fuel under pressure, such as butane, propane, and similar fuels which are adapted to turn into a gas upon being released into the atmosphere from the reservoir or container.

A feature resides in the combination of a cartridge which carries a supply of liquified fuel and the neck of which is threaded so as to receive the lighter unit which includes a fuel release valve which permits the fuel from the cartridge to leak slowly through the same, a snuffer cap, and a pyrophoric flint and abrading wheel to direct a spark over the nozzle of the lighter unit. This combination of elements including mainly the cartridge holding a supply of compressed fuel for the flame of the lighter and the lighter unit provide the essential elements of the combination which produce a simple inexpensive lighter, either of the pocket type or a desk type, and wherein a large number of lights are obtainable from the cartridge without replacing the same.

A further feature resides in providing a lighter wherein a new cartridge may be readily attached to the ignition unit mechanism, and the old cartridge can be discarded, or the cartridge may be refilled so that it may again be attached to the lighter unit. Where the cartridge is refilled, it may be used over and over again, and thus provide an economical means of supplying new cartridges of fuel to the user of the lighter.

A further feature resides in providing the ignition unit which does not use a wick like the old gasoline type lighters which required cleaning of the wick from time to time to keep the lighter in good condition. In this lighter the nozzle is formed with a hollow passageway which is normally closed by a spring urged snuffer valve having a soft seat closing the passageway in the nozzle. The lighter unit is operated by lifting the snuffer cap and simultaneously throwing a spark over the nozzle out of which the gas is escaping from the cartridge.

It is also a feature to provide a lighter unit mechanism which is formed with a piercing member to pierce the seal of the cartridge in the attaching of the lighter unit to the cartridge or the element which opens the cartridge may be in the form of a member or means which contacts the stem of the valve which normally closes the cartridge while the same is in storage and unit it is adapted for use.

The cartridges for the fuel may be round, flat, or any suitable shape, and are adapted to provide the body of the lighter being formed with a threaded neck so that the lighter unit may be attached or disengaged from the cartridge at will.

All of the features and details, together with the objects, will be more fully hereinafter defined.

In the drawings forming part of the specifications:

Figure 1 is an enlarged sectional view of the lighter unit showing the same attached to a cartridge which provides a supply of fuel.

Figure 2 is an enlarged detail side elevation of my

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lighter looking in the direction along line 2-2 of Figure 1.

Figure 3 is a plan view of Figure 1.

Figure 4 is a sectional detail of the fuel cartridge showing a closure valve for the same.

The drawings illustrate the removable ignition lighter unit A which is adapted to be attached to the fuel cartridge B by means of the threaded neck 10 formed on the cartridge B which engages the complementary threads 11 formed in the casing 12 of the lighter unit A.

The unit A includes a hollow flame nozzle 13 with the passageway 14 formed extending through the same and through which the gas from the reservoir B escapes when the lighter unit A is operated.

The unit A also includes a snuffer valve 15 which is urged by the ignition springs 16 into closed position and which is provided with a soft cushion closure 17. The snuffer valve 15 is opened or raised away from the nozzle 13 by engagement with the rearwardly and upwardly projecting ears 18. When the ears 18 are engaged to raise the valve 15, a spark from the pyrophoric element 19 is directed across the open end of the nozzle 13 by the flint wheel 20 which abrades the flint element 19 and is operated by the pressure of the operator's finger on the teeth of the abrading wheel simultaneously with the engagement and operation of the ears 18 in a downward direction as indicated by the arrow in Figure 1.

The valve 15 normally closes the opening 14 in the nozzle 13 and prevents any gas from escaping from the cartridge B. The chamber 21 of the cartridge B is substantially filled with absorbent cotton 22 which is adapted to be virtually saturated with the butane or propane liquid fuel ordinarily contained within the cartridge B.

In the cartridge B illustrated in Figure 1 the core of the valve 13 is formed with a downwardly piercing element 23 which pierces the cap 24 which normally seals the cartridge B. The piercing operation by the element 23 takes place when the unit A is attached to the cartridge and as illustrated in Figure 1.

The passageway 14 through the nozzle 13 is formed near its lower end with an obstruction 24' so as to reduce the size of the opening 14 in a manner to form a minute passageway for the gas from the chamber 21. In this manner, the gas from the chamber 21 of the cartridge B is caused to slowly leak through the nozzle 13 when the valve 15 is elevated. The leak is obtained by a predetermined seating of the obstruction 24' in the passageway 14 near the lower end thereof and is governed by the size of flame that is desired at the top of the nozzle 13. The nozzle 13 is held in position by the collar 25, and a sealing ring 26 prevents leakage of the gas around the nozzle in the unit A.

The cartridge B may be formed with a releasable valve C which is positioned in the neck 27 of the same and is provided with a stem 28 which opens the valve when the unit A is attached to the cartridge by the engagement of the stem 28 on the bottom of the nozzle body 13.

When the cartridge B is equipped with a valve C in the same, the cartridge may be normally closed by the valve itself, and in addition a cap 29 is provided which carries a sealing rubber washer 30, thus maintaining a tight seal on the cartridge B for storage, shipment, and in the handling of the same before the cartridge is attached to the lighter ignition unit A.

A feature of this lighter resides in its extreme simplicity where a pocket lighter of comparatively small size may be obtained with a small size lighter unit A detachably secured to the cartridge and wherein the lighter unit is of extremely simple construction, thus providing an economical means of manufacturing a lighter which is adapted to be supplied with fuel by replaceable cartridges. While the cartridges may be covered with

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any form of decorated casing, they may be also made of aluminum which can be anodized in different colors to make the body of the cartridge attractive and to provide a wear resistant surface to the cartridge. Further, the cartridge for the fuel supply may be formed round, oblong or flat, however with a preferably threaded neck which can be attached readily to the lighter unit A, and the cartridge may be covered with leather for decorative purposes, or any other suitable material. In fact, they may be enameled in different colors if desired, thereby providing a very attractive lighter.

When the cartridge B is filled with cotton 22 and the valve C is inserted in the neck 27 of the cartridge, we provide a protective screen for the lower working end of the valve which holds the cotton 22 away from the valve. Thus, the valve C is free to operate without interference from the cotton within the cartridge.

A primary feature resides in the combination of a detachable lighter unit with a closure valve, means for attaching the same to a cartridge, and the cartridge for the fuel which may be readily replaced for a filled cartridge, and in the use of a cartridge which contains a valve and cap for closing the same, all of which elements operate as a combination to provide a wickless lighter which is of a desirable design and construction to make an attractive cigarette lighter in an economical manner.

We claim:

1. In a cigarette lighter, a cap member having an opening extending therethrough and threads formed in the lower and upper ends thereof, shoulder means formed internally of and intermediate the ends of said cap member, a nozzle positioned on said shoulder and extending outwardly of the upper end of said cap member, a slow leak gas passageway formed through said nozzle, a threaded collar adapted to engage the threads of the upper end of said cap member and bear against the top end of said nozzle to secure the same against said shoulder, a spring urged closure cap for said nozzle pivotally mounted on said cap member, said closure cap having finger engageable means, a flint abrading wheel rotatably mounted on said cap member adjacent said finger engageable means, a spring urged flint mounted in said cap member adjacent said flint abrading wheel, a cartridge member having a supply of liquefied petroleum fuel and formed with a threaded neck portion adapted to engage the lower threaded portion of said cap member and means for puncturing the top of said cartridge as the same is screwed into position in said cap member.

2. A cigarette lighter comprising a hand engageable cartridge containing a supply of liquefied petroleum fuel, a cap-like member for said cartridge having an opening formed therethrough, means for connecting said cap-like member to the top of said cartridge, a nozzle, means for maintaining a seal between said nozzle and the inner surface of said cap member, a slow leak gas passageway formed through said nozzle, means for puncturing the top of said cartridge when the same is connected to said cap member, a spring urged nozzle closure member pivotally mounted on said cap member, a flint abrading wheel

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rotatably mounted on said cap member and adapted to be actuated simultaneously with the pivoting of said closure member, and a flint mounted in said cap member in contact with said flint abrading wheel.

3. In a cigarette lighter, a substantially cylindrical cap support member, a substantially cylindrical nozzle member, means for securing said nozzle in said support member, a slow leak gas passageway formed through said nozzle, threaded means formed on the lower end of said support, a cartridge containing a supply of liquefied petroleum having threaded means adapted to engage with said threaded means of said support, means in said support for puncturing the top of said cartridge when the same is screwed into said support, a flint, means for supporting said flint in said cap support, a shaft mounted on said cap support member, a flint abrading wheel mounted on said shaft in contact with said flint, a spring urged cap member for said nozzle pivotally mounted on said shaft and operable in conjunction with said flint abrading wheel, a soft valve closure member mounted on said cap member adapted to close against said nozzle member when said cap member is pivoted downwardly and open said nozzle when said cap member is raised.

4. A cigarette lighter comprising a substantially cylindrical top support member having threads formed in the lower end thereof, a gas supply cartridge member having threads formed thereon adapted to engage said threads of said top support member, a cylindrical plug-like nozzle member, means for securing said nozzle member in said support member, a slow leak gas passageway formed through said nozzle, a longitudinally extending projecting portion along one side of said top support member, an opening extending through said projecting portion, a flint and spring mounted in said extended opening, a flint abrading wheel mounted on said top support member in contact with said flint for abrading the same, a spring urged cap member pivotally mounted on said support member having finger engageable ear members extending therefrom positioned on each side of said flint abrading wheel, said cap member having a cushion member secured thereto adapted to contact said nozzle and close off said passageway and open said passageway when said ear members are moved downwardly in conjunction with simultaneous rotation of said flint abrading wheel.

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