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PYROPHORIC LIGHTER CONSTRUCTION

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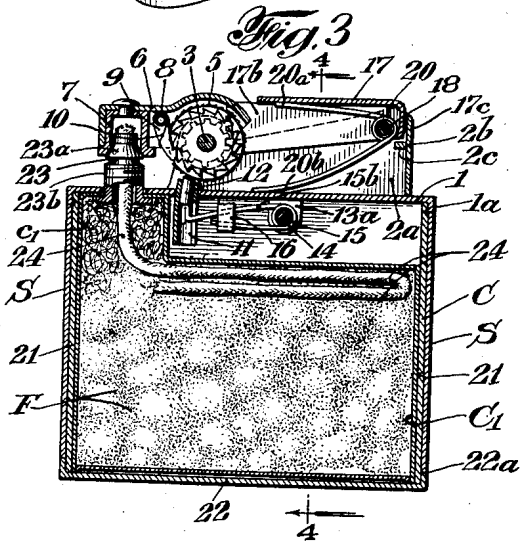
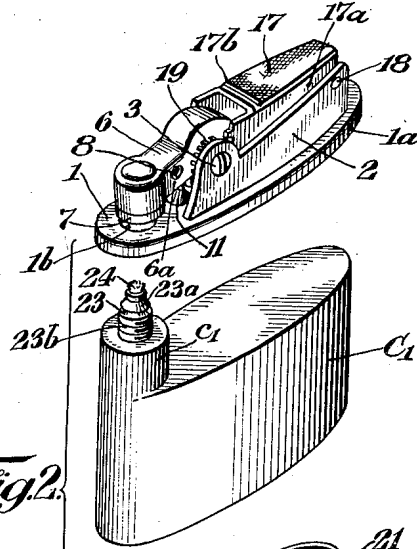
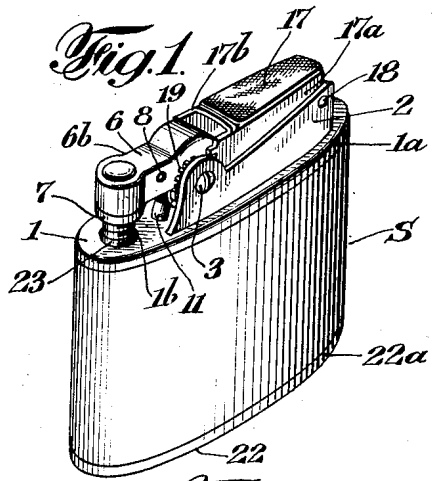
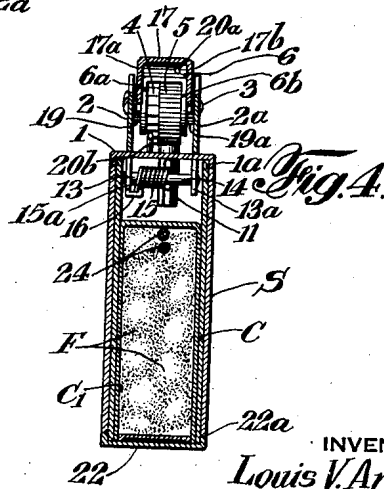
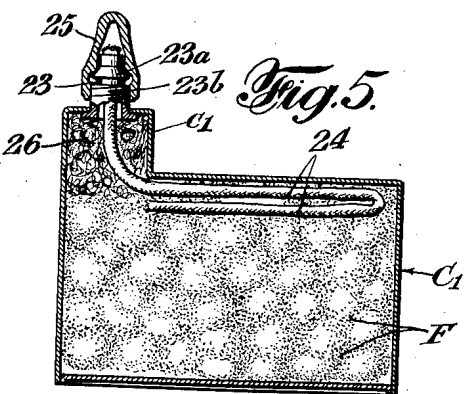


Fig. 2.



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PYROPHORIC LIGHTER CONSTRUCTION

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5 Claims. (Cl. 67—7.1)

My invention relates to a fuel container and to pyrophoric lighting mechanism with which said fuel container may be associated.

My invention, in one of its prominent phases, relates to an arrangement for supplying fuel of suitable character to pyrophoric lighter mechanism.

My invention, in other prominent phases thereof, relates to fuel containers, and to novel pyrophoric lighter mechanism together with novel arrangements thereof.

Various other objects, advantages and characteristics of my invention will become apparent from the following description taken in connection with the accompanying drawing.

My invention resides in the fuel container, pyrophoric lighting mechanism, novel combinations and arrangement of parts of the character hereinafter described and claimed.

For an understanding of my invention and for an illustration of one of various possible forms thereof, reference is to be had to the accompanying drawing, in which:

Figure 1 is a perspective view of a pyrophoric lighting device constructed in accordance with my invention;

Fig. 2 is a perspective view of the device shown in Fig. 1 but illustrating parts thereof in disassembled relation;

Fig. 3 is a vertical sectional view, partly in elevation, of the device shown in Fig. 1;

Fig. 4 is a transverse vertical sectional view, partly in elevation, and is taken on the line 4—4 of Fig. 3 looking in the direction of the arrows; and

Fig. 5 is a vertical sectional view, partly in elevation, of a novel form of fuel container.

Referring to the drawing, 1 illustrates a plate or member having spaced, chamber-forming walls 2, 2a upstanding therefrom, adjacent ends of said walls preferably being connected by a transverse wall 2b, Fig. 3. The aforesaid walls 2, 2a, at their connecting wall 2b, may terminate closely adjacent one end of the plate 1, the other ends of said walls 2, 2a being unconnected and preferably terminating nearer the center of plate 1 than the other end of said plate 1.

Extending through said walls 2, 2a, at the end thereof removed from the connecting wall 2b, is a pin or member 3 carrying, in side-by-side relation, a ratchet wheel 4 and a peripherally-roughened wheel 5, the wheels 4 and 5 being suitably secured together for free rotative movement as a unit on the member 3.

Freely oscillatory on the member 3 is a mem-

ber 6 having depending side walls 6a and 6b between which the aforesaid wheels 4 and 5 are snugly received and which, adjacent one end thereof, have the aforesaid pin or member 3 extending therethrough. At its end removed from said member 3, the member 6 has a snuffer cap 7 secured thereto in any suitable manner. A pin 8 extending through the aforesaid walls 6a and 6b carries a pawl 9, the notched end of which is suitably biased toward and into engagement with the ratchet wheel 4, as by a spring 10.

Extending through the plate 1 is a tube 11 from the upper end of which a pyrophoric element 12 partly projects, Fig. 3. The upper end of the pyrophoric element 12, Fig. 3, is adapted to engage the periphery of wheel 5 with considerable pressure and, to this end, any suitable arrangement may be utilized such, for example, as herein illustrated wherein the plate 1 is provided with depending ears 13, 13a through which extends a rod 14 having a spring 15 coiled therearound. One end 15a of the spring 15 is suitably held in fixed position, as by engagement with a lateral arm of a bracket 16 depending from the plate 1. The other end 15b of spring 15 extends through a slot formed longitudinally in the tube 11 and engages the lower end of the pyrophoric element 12, said spring end 15b, when positioned as shown in Fig. 3, tending to swing in a clockwise direction, due to the unwinding tendency of the spring 15, whereby the pyrophoric element 12, with considerable pressure, is held in engagement with the periphery of wheel 5.

Various suitable arrangements may be utilized for actuating the wheel 5 to cause it, by coaction with the pyrophoric element 12, to produce sparks for fuel-ignition or flame-producing purposes. As herein illustrated, there is thus utilized a manually operable member 17 having depending, spaced side walls 17a, 17b partly disposed interiorly of the aforesaid upstanding walls 2 and 2a, adjacent ends of said walls 17a, 17b preferably being connected by a transverse wall 17c. A pin or member 18 extends transversely through said upstanding walls 2, 2a closely adjacent the aforesaid transverse wall 2b and the actuating member 17, at its depending walls 17a and 17b, is pivoted on said pin 18, the transverse wall 17c being disposed between the pin 18 and the transverse wall 2b, Fig. 3.

As shown on the drawing, said depending walls 17a and 17b of actuating member 17 extend toward the member 3 and each is formed with rack teeth, the sets of rack teeth meshing, respectively, with pinions 19, 19a secured to the respec-

tive exterior surfaces of the walls 6a and 6b of member 6, whereby said member 6 together with the pinions 19, 19a are freely oscillatory as a unit about and with respect to the member 3.

5 The actuating member 17 may be suitably biased in a clockwise direction, Fig. 3, as by a spring 20 coiled about the pin 18 and having one end 20a engaging the lower surface of actuating member 17 and having the other end 20b thereof engaging the upper surface of plate 1.

10 Preferably, in accordance with my invention, a suitable arrangement is provided for limiting clockwise movement, Fig. 3, of the actuating member 17 under the influence of spring 20. To this end, there may be utilized a lug 2c which projects laterally from the interior surface of transverse wall 2b and is interposed in the path of the transverse wall 17c of actuating member 17.

20 The plate 1 constitutes a supporting member for the parts hereinbefore described which, as shown at the top of Fig. 2, form a unitary device utilizable for spark-producing purposes. As thus illustrated, the plate 1 may be held in one hand and the actuating member 17 depressed in opposition to the expansive tendency of spring 20. The hereinbefore described sets of rack teeth coacting, respectively, with the pinions 19 and 19a cause the member 6 to swing clockwise, Fig. 2, the pawl 9 coacting with the ratchet wheel 4 to impart a step of movement to the latter and to the serrated wheel 5. Accordingly, the latter coacts with the pyrophoric element 12 to produce a shower of sparks which are directed beneath the snuffer cap 7.

35 Upon release of pressure on the actuating member 17, the latter moves clockwise, Fig. 2, under the influence of spring 20 until wall 17c comes into engagement with the lug 2c to thereby discontinue such movement of the actuating member 17, the last described movement of the latter causing the member 6 to swing counter-clockwise, Fig. 2. However, during such movement of the member 6, the pawl 9 idles with respect to the ratchet wheel 4 and consequently the wheel 5 remains stationary.

40 With the above described type of operating mechanism, the finger piece is so pivoted and mounted as to be conveniently and smoothly operated with very little friction and at the same time, upon depression of the finger piece, its top surface becomes inclined inwardly toward the midportion of the top of the lighter so that there is no liability that the user's finger or thumb will slip off from the top corner of the lighter. Furthermore, when the finger piece is in its normal position, as well as when in its depressed position, it is free of any awkward or unsightly protruding parts. Also, with the pivot for the finger piece thus being located at the top corner of the lighter, the pivot forms a convenient axis for the biasing spring therein and permits of a compact relationship of the spring within the finger piece with the spring entirely sealed.

50 In accordance with one form of my invention, there is utilized a casing C which per se is open at the top, comprises side wall structure 21 of oval, square or other suitable configuration, and also comprises a base 22 suitably secured to said side wall structure 21 to form the casing bottom wall.

60 The aforesaid plate 1, with the various parts of the spark-producing mechanism assembled thereon, is adapted to be detachably secured to the casing side wall structure 21 to form the top

75 wall of the latter. This detachable relation may be obtained in any suitable manner such, for example, as herein illustrated wherein the plate 1 is shown as having a depending peripheral flange 1a forming a somewhat resilient section adapted to be detachably interlocked with the grooved upper section of the side wall structure 21. Obviously, the plate 1 is securely held to the casing C in the manner described above and at the same time, without undue effort, said plate 1 may be readily detached from or secured to the casing C.

15 The casing C is adapted to receive a supplementary casing C1 containing a suitable amount of fuel F which may be liquid in character but, as shown and preferably, is semi-solid, jelly-like fuel such, for example, as is now available on the market.

20 The supplementary casing C1 may be formed of any suitable material, such as sheet material and, more particularly, sheet metal. It may be of such configuration as is desired but preferably conforms in configuration with the casing C and is of such dimensions as to be snugly received therein. Since, in the example shown, the tube 11 and the biasing mechanism for the pyrophoric element depend into the casing C, it results that the casing C1 should be of less height than the casing C, Fig. 3.

25 In accordance with an important phase of my invention, the casing C1 carries an upstanding tubular structure 23 which is suitably secured, preferably but not necessarily, to the top wall of an upper extension casing c1 of the casing C1 whereby the passage through said tubular structure 23 communicates with the interior of said casing C1.

30 The aforesaid plate 1 is formed with an opening 1b through which the tubular structure 23 projects, and an upper surface 23a of the latter is suitably fashioned for coaction with the aforesaid snuffer cap 7, Fig. 3. The tubular structure 23 also serves as a wick tube for the extension therethrough and slightly therebeyond of a wick 24 which largely is arranged interiorly of the casing C1 in any suitable manner.

35 With all of the parts hereinbefore described, related as shown in Fig. 3, inflammable material from within the fuel-containing casing C1 comes to the upper exposed end of wick 24. Accordingly, depression of the manually actuatable member 17 causes the production of sparks as described above, the sparks producing flame at said upper end of wick 24, the latter being exposed when the snuffer cap 7 is elevated. Upon release of pressure on the manually actuatable member 17, the parts return to the position shown in Fig. 3, the snuffer cap 7 returning to engagement with the surface 23a of tubular structure 23 to extinguish the flame and to close the passage from the interior of the fuel casing C1 to the outside atmosphere.

40 As will be noted from Fig. 3, the tubular structure 23 coacts with the snuffer cap 7 to discontinue clockwise movement, Fig. 3, of the actuating member 17 before the transverse wall 17c thereof comes into engagement with the lug 2c. Accordingly, the spring 20, acting through the train of mechanism, functions to hold the snuffer cap 7 against the surface 23a. The lug 2c is provided to prevent undue movement of the actuating member 17 and member 6 while the plate 1 is removed from the casing C for, at that time, the snuffer cap 7 and tubular structure 23 are disassociated. Accordingly, were the lug 2c, or equiva-

lent, not provided, the spring 20 probably would swing the actuating member 17 to such an extent in a clockwise direction, Fig. 2, that the sets of rack teeth at the ends of the members 17a and 17b would become disengaged, respectively, from the pinions 19 and 19a.

It is intended that fuel-containing casing such as the herein described casing C1 shall be sold on the market and that the user of the lighting mechanism, when the fuel is exhausted from that casing C1 associated with his lighting mechanism, shall manually detach the plate 1 from the casing C, remove the therein-contained empty casing C1 together with the used wick 24 and tubular structure 23, discard the same, and purchase a new duplicate casing filled with fuel and having a tubular structure 23 through which an unused wick extends, the latter casing being readily insertable in the main casing, whereupon the plate 1 may quickly and easily be secured in operative position on said main casing with the new tubular structure 23 extending through the opening 1b in operative position.

One form of a suitable supplementary fuel-containing casing C1 adapted for sale on the market is shown in Fig. 5. This casing is the same as disclosed in Figs. 2 and 3 but, in addition, has a closure cap 25 threaded to an externally threaded section 23b of the tubular structure 23. While in storage or on display in stores, the provision of the cap 25 is desirable because preventing evaporation of fuel through the passage of tubular structure 23.

The fuel F may be disposed within the casing C1 in any suitable manner. It may be sealed therein somewhat the same as material is sealed into ordinary collapsible tube-like containers or, if desired, the casing C1 may be fashioned with an opening through which the fuel is later inserted, said opening thereafter being sealed or closed in any suitable manner. Or any other suitable arrangement or construction may be called into use for obtaining a supplementary fuel-containing casing of the desired configuration and with the desired fuel capacity.

An important advantage of re-fill fuel casings as constructed in accordance with my invention resides in the fact that the user of the lighter mechanism obtains a new wick with each fresh supply of fuel. The presence of an unclogged wick in the lighter mechanism is desirable and, moreover, adjustments as to wick height above the wick tube are not so often required. It shall be understood, however, that my invention is not to be limited to the permanent association of a wick with each re-fill casing since the lighting mechanism may have a wick more or less permanently associated therewith for repeated use with subsequent supplementary fuel-containing casing.

As shown particularly in Figs. 3 and 5, the fuel-containing casing C1 and particularly the extension casing c1 thereof may contain a mass 26 of absorbent material, as cotton. The use of such absorbent material is sometimes desirable but it shall be understood that my invention is not to be limited thereto.

When the pyrophoric element 12 becomes worn to such extent that a new one is required, the plate 1 may be detached from the casing C whereupon, by suitable manipulation of the spring 15, the worn pyrophoric element may be removed and a new one substituted therefor. Thereupon, the plate 1 may readily be attached to the cas-

ing C to return the lighter mechanism to operative condition.

The operating parts of the lighting mechanism per se are herein shown and described merely for the purpose of disclosing one of the various forms of such mechanism with which my invention is utilizable.

Although the use of the disclosed construction involving the detachable plate 1 is desirable because opening the casing C for re-fill purposes and further, because exposing the pyrophoric element and its biasing mechanism for manipulation when a new pyrophoric element is required, it shall be understood that the invention is not limited to the utilization of a detachable cover plate 1 such as disclosed herein or one generally the equivalent thereof. This is true because other arrangements may be utilized for replacement of pyrophoric elements and also other arrangements may be utilized for gaining access to the main casing C so that a new re-fill casing C1 may be substituted for an empty one.

As herein illustrated, the bottom plate 22 of the casing C is provided with a peripheral flange 22a against which a sleeve S is adapted to be disposed, said sleeve S encircling and closely engaging the side wall structure 21 of casing C, and said sleeve, at its end opposite the flange 22a, being disposed in abutting relation with respect to the flange 1a of plate 1 and, with the arrangement herein shown, being disposable on the side wall structure 21 only after the plate 1 has been removed therefrom. While the use of a sleeve S is desirable with some casing constructions, it shall be understood that my invention is not to be limited thereto and that the use thereof is entirely optional.

As hereinbefore stated, the use of semi-solid or jelly-like fuel F is desirable. It shall be understood, however, that re-fill casings C1 may contain liquid fuel rather than semi-solid or jelly-like fuel, if desired.

While the invention has been described with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. In pyrophoric lighting mechanism, a main casing, a fuel casing therein, a mechanical assembly carried by and detachable as a unit from said fuel casing, said assembly comprising a plate forming a wall at the top of said fuel casing, the top surface of said fuel casing forming a pocket with and below said plate, a single sparking means having elements disposed on both sides of said plate and carried thereby, the elements on the lower side of said plate being received in said pocket, a snuffer-carrying member movably supported on said plate, and a manually operable member for moving said snuffer-carrying member.

2. In pyrophoric lighting mechanism, a main casing, a fuel casing therein, a mechanical assembly carried by and detachable as a unit from said fuel casing, said assembly comprising a plate forming a wall at the top of said fuel casing, the top surface of said fuel casing forming a pocket with and below said plate, a single sparking

means having elements disposed on both sides of said plate and carried thereby, the elements on the lower side of said plate being received in said pocket, a pivoted member on said plate, a snuffer cap carried by said pivoted member, and a manually depressible member for operating said pivoted member.

3. In pyrophoric lighting mechanism, a main casing, a fuel casing therein, a mechanical assembly carried by and detachable as a unit from said fuel casing, said assembly comprising a plate forming a wall at the top of said fuel casing, the top surface of said fuel casing forming a pocket with and below said plate, a single sparking means having elements disposed on both sides of said plate and carried thereby, the elements on the lower side of said plate being received in said pocket, a pivoted member on said plate, a snuffer cap carried by said pivoted member, and a manually depressible member for operating said pivoted member, the depressible member and pivoted member being so related as to move in opposite directions upon depressing the depressible member and substantially within the planes of the sides of the main casing.

4. A benzine pocket lighter comprising a body and cover, a wick extending above the cover, a supporting frame secured to the cover, a pressure lever pivoted at one end to the frame, an arm

pivoted on the frame with its pivot in the same plane as the lever pivot, a rack tooth contact between the arm and the other end of said pressure lever, and a wick cap carried by the arm, depression of said pressure lever moving the same in one direction about its pivot and causing said arm to move in the opposite direction about its pivot, said pressure lever and said arm moving substantially within the planes of the sides of the body.

5. A benzine pocket lighter comprising a body and cover, a wick extending above the cover, a supporting frame secured to the cover, a pressure lever pivoted at one end to the frame, a stop carried by the frame and disposed in the path of the end of said pressure lever, an arm pivoted on the frame with its pivot in the same plane as the lever pivot, a rack tooth contact between the arm and the other end of said pressure lever, and a wick cap carried by the arm, said pressure lever comprising a flat manually engageable section positioned between the pressure lever pivot and the rack tooth contact, depression of said pressure lever moving the same in one direction about its pivot and causing said arm to move in the opposite direction about its pivot, said pressure lever and said arm moving substantially within the planes of the sides of the body.

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