Nov. 28, 1933. T. E. D. BILDE ET AL 1,937,080

POCKET LIGHTER

Filed Nov. 10, 1932

Fig. 1

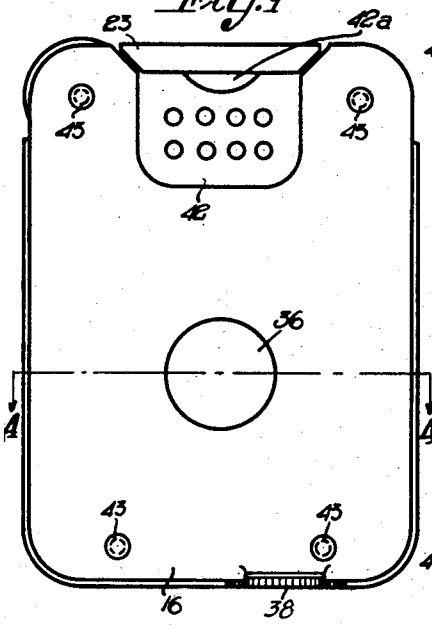


Fig. 2

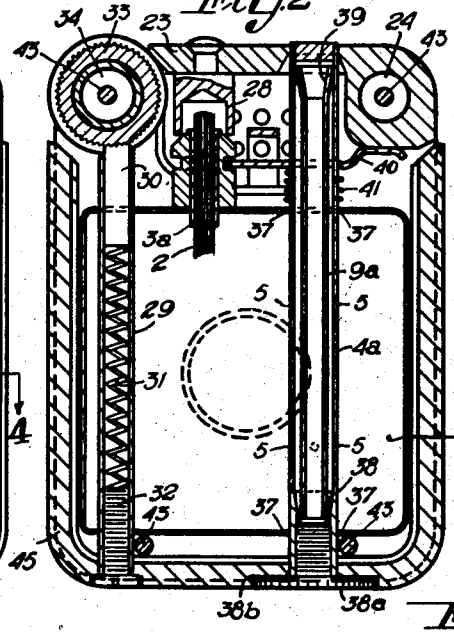


Fig. 9

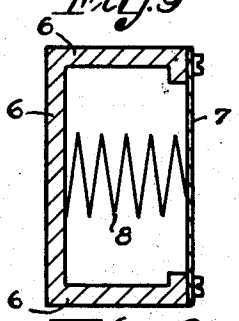


Fig. 12

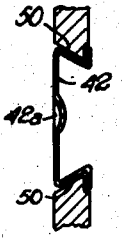


Fig. 5

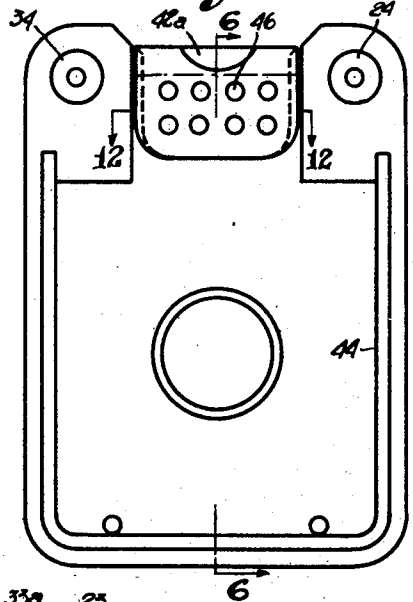


Fig. 6



Fig. 7

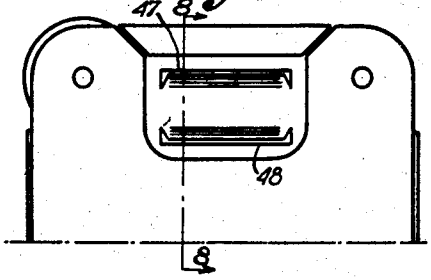


Fig. 8

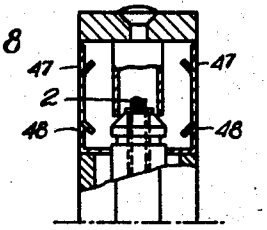


Fig. 10

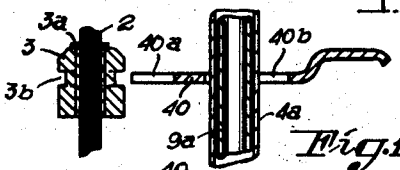


Fig. 11

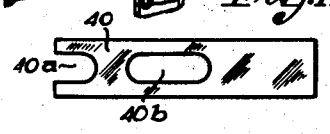


Fig. 3

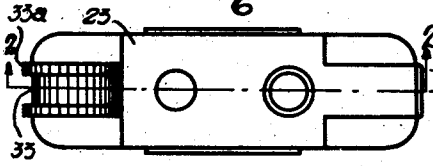
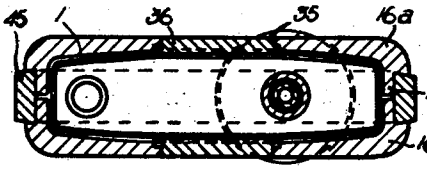


Fig. 4



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UNITED STATES PATENT OFFICE

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POCKET LIGHTER

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Application November 10, 1932, Serial No. 642,110, and in Germany May 7, 1931

4 Claims. (Cl. 67—7.1)

This invention is for improvements in or relating to pocket lighters for use with liquid fuel.

Pocket lighters are already known, in which a suction pump of the piston type is utilized. In one type of pocket lighters of this kind the lower portion of the whole apparatus has to be dipped into a fuel container, thereby soiling the apparatus. In another type the piston pump is provided with valve means which may give cause to leakages.

According to the present invention there is provided a pocket lighter employing liquid fuel, characterized by the provision of a diaphragm suction pump device arranged in the lighter and operable to fill the container thereof with fuel.

An advantage of the diaphragm suction pump device according to the present invention, if constructed as hereinafter described, is that the pump is operable to introduce the fuel directly into the container without the interposition of valves, and thereby the use of movable parts which easily become inoperable is avoided. The pump device according to the invention is provided with a suction pipe which can be moved into the lighter, so that the said pipe normally does not project from the lighter.

A further feature of the invention consists in that all parts pertaining to the lighter, are arranged in such a manner that in the normal position no part extends beyond the confines of the casing. In addition, the casing is made of two preferably symmetrical parts which are so shaped that the same may be united in such a manner as to form seats for the parts necessary for the function and the assembly of the lighter. By this means the manufacture is considerably simplified, so that the production of the apparatus is considerably cheapened. The casing or its parts consist preferably of plates of artificial resin, bakelite or similar material, as it has been found that such material possesses great resistance against wear and corrosion and also makes the handling of the lighter more pleasant than if the casing is made of metal. Preferably, the two halves of the casing are constructed so as to be exactly similar, so that the same may be uniformly worked. For example preferably the two halves of the casing are formed so that the journals for the ignition wheel and for the lid are situated at the same distance from the edges of the casing halves.

A further feature consists in that a wind screen is provided to screen the flame, the said wind screen being detachably arranged, so that the wick is easily accessible. The wind screen may in this case be so shaped that reserve ignition stones (ceric stones) may be accommodated in the same. In spite of the fact that the parts all are arranged within the casing, the parts necessary for the ignition are arranged in such a manner that the lighter may easily and conveniently be actuated with one hand only.

Some forms of embodiment of the subject matter of the invention are illustrated on the drawing, in which:—

Figure 1 is a side elevation of a lighter provided with a diaphragm suction pump device constructed in accordance with the invention.

Figure 2 is a vertical section on the line 2—2 in Figure 3.

Figure 3 is a plan view of the lighter illustrated in Figure 1.

Figure 4 is a horizontal section of the lighter on line 4—4 in Figure 1.

Figure 5 is an internal view of one part of the casing of the lighter.

Figure 6 is a vertical section on the line 6—6 Figure 5.

Figure 7 is an external view of the upper part of a lighter provided with a modified wind screen.

Figure 8 is a vertical section on the line 8—8 in Figure 7.

Figure 9 is a section through a modified form of embodiment of the diaphragm suction pump device.

Figure 10 shows the manner of mounting a spring for the lid, the parts being shown in sections.

Figure 11 is a plan view of the spring shown in Figure 10, and

Figure 12 is a section on the line 12—12 Figure 5.

A lighter constructed in accordance with the invention consists substantially of the fuel container 1 in which an absorbent material, for instance wadding, may be inserted, for absorbing the fuel introduced by the pump device hereinafter described, and from the interior of the container and through a burner or tube 3 extends a wick 2. The wick 2 is preferably fitted within a tube like fitting 3a adapted to be inserted into the tube 3 which forms a seating therefor.

The diaphragm pump device consists of the container 1 itself which for this purpose is preferably made of resilient material, for example of brass, the longer walls of which are of substantially convex form as shown in Figure 4. For the actuation of this diaphragm pump the casing 16 which consists of two portions 16a and 16b

hereinafter described is provided at both sides with openings 35 having peripheral recesses. In each of these openings is inserted a correspondingly shaped button 36 of artificial resin, bakelite or the like in such a manner that the external surface of the said button lies substantially in the same plane as the external surface of the casing 16. Through the container 1 extends a tube 4*a* which is secured to the said container 1 for example by soldering around the apertures through which the tube 4*a* extends. This tube 4*a* is provided with lateral openings 5, through which the interior of the tube 4*a* is arranged in communication with the interior of the container 1. The lowermost of the openings 5 is situated some distance above the lower wall of the container in order that upon the introduction of the fuel into the container a quantity of the fuel may be collected. Within the tube 4*a* is situated a filling tube 9*a*, which is normally held within the tube 4*a* by means of a screw 38*a*, between which and the casing 16 a packing disk or washer 38*b* is arranged. A conical seat 38, formed in the lower part of the tube 4*a*, is arranged to cooperate with the conical upper end 39 of the tube 9*a*, when the tube 9*a* has by its own weight dropped to its lowermost position in the tube 4*a* which may be effected by removing the screw 38*a*. In order to fill the container 1 it is then only necessary to hold the lower end of the filling tube 9*a* within a reservoir of liquid (not shown) and to press a few times upon the buttons 36 and thereafter move the tube 9*a* inwardly and reinsert the screw 38*a*. Instead of constructing the container 1 of resilient material, all the walls 6 thereof except one side wall 7 may be formed of rigid material, such as indicated in Figure 9, whilst the remaining wall 7 or a part thereof may be formed of resilient material and a spring 8 inserted between the flexible material and the rigid wall opposite thereto. In this manner a one sided spring actuated diaphragm pump device is provided.

The lighter is provided with a tube 29 which may be secured to the casing 1 in a similar manner as the tube 4*a* for the accommodation of an ignition stone (ceric stone) 30 which is urged by a spring 31 towards an ignition wheel 33 rotatably mounted upon a pivot 34 in the casing 16. The lower end of the spring 31 is supported by a plug 32 arranged to be screwed into the tube 29.

The ignition wheel 33 is formed with lateral flanges 33*a* of greater diameter than the serrated wheel proper, by means of which the wheel may be rotated by the operator. A lid 23 is mounted upon a pivot 24 in the casing 1 and that end of the lid adjacent to the pivotal point abuts against a plate 40 between which and the container 1 a spring 41 is inserted.

In the assembling of the parts of the lighter the member 40 which is formed with an elongated aperture 40*b*, Figures 10 and 11, is placed over the tube 4*a* after the spring 41 has been placed in position. The member 40 is thereafter pressed downwardly until the end of the said member which is adjacent the burner 3 and is provided with a slot 40*a*, is in line with an annular groove 3*b* formed in the said burner whereupon the said member 40 is moved towards the burner 3 and the said slot 40*a* engages the annular groove 3*b* which serves to locate the member 40 in position. By means of this arrangement the lid 23 may be kept either in its closed or its opened position.

The lid 23 is provided with a cap 28 which serves the purpose after the kindling of the wick 2, to extinguish the flame during the closing of the lid 23. In the closed position of the lid the burner 3 provides a seat for the cap 28.

The pivots 24 and 34 shown in Figures 1 and 2 which are provided respectively for the ignition wheel 33 and for the lid 23 and through which extend fastening members 43 for the two parts 16*a* and 16*b* of the casing (Figure 4), are positioned symmetrically, and lower fastening members 43 are arranged in a similar manner. These fastening members 43 may consist of screws or rivets or the like. They extend, as shown in Figure 2, through the casing 16 externally of the container, 1.

Figures 5 and 6 show the symmetrical form of the casing parts. On each part of the casing is arranged a ledge or rib 44 which extends around the same on three sides, and in assembling the various parts of the lighter and prior to uniting the casing parts 16*a* and 16*b* by means of the fastening members 43 a U-shaped clamp consisting of one or more parts 45 (Figures 2 and 4) of any desired material, for example of metal is inserted between the casing parts, so as to engage the recesses formed by the ledges 44. By this means the whole lighter is strengthened and the assembling and the dismantling of the lighter is facilitated.

A wind screen 42 shown in Figures 1, 2 and 5 consists of two U-shaped members which are detachably mounted so as to provide access to the wick 2, and the lateral walls of which are provided with ventilation holes 46. In lieu of these holes, if desired, the walls may be slit for example as shown at 47 and 48 and pressed inwardly whereby longitudinal slots are formed, which are arranged in such a manner in relation to the wick 2 that the entering air which serves for the combustion, does not directly affect the flame. It will be understood that in addition to the slots, holes similar to the holes 46 may be provided. The two parts 16*a* and 16*b* of the casing are formed with tapering recesses 50, Figure 12 and indicated by the dotted lines in Figure 5 for the reception of the wind screens 42 which are inserted from above into the said recesses. The wind screen is preferably formed with a recess or recesses 42*a* in such a manner that the lid of the lighter may be opened by the insertion of the operator's thumb through the said recesses 42*a*.

What we claim is:—

1. A self filling lighter comprising a closed fuel reservoir having a wick extending thereinto and a resiliently yieldable side, a tube open at one end which extends beyond the confines of said reservoir, said tube having, within the confines of said reservoir, an opening which is located some distance above the bottom of the fuel reservoir, a second tube within said open end tube and movable downwardly through the lower end of said first mentioned tube so that the upper end of the second tube is below said opening.

2. A self filling lighter comprising a fuel reservoir containing a tube extending entirely through the reservoir and having a hole in its side considerably above the bottom of the reservoir, said reservoir having resiliently yieldable opposite sides, a suction pipe movable downwardly longitudinally within said tube until its top end is below said opening, a conical shoulder at the upper end of the suction pipe, and a conical seat at the bottom

of said tube adapted to form a close joint with said conical shoulder.

3. The combination with a lighter of a fuel reservoir containing a tube extending through the top and bottom of the reservoir, said reservoir having a resiliently yieldable side, a suction pipe movable downwardly through the top and bottom of said tube, an outer casing containing said fuel reservoir and having an opening in the side thereof, and a button fitting in said opening and in contact with said resiliently yieldable side of the fuel reservoir.

4. The combination with a lighter of a fuel reservoir having resiliently yieldable opposite sides, a tube sealed in the bottom of the reservoir and having open communication with the interior of the reservoir only at a considerable distance above the bottom of the reservoir, and a rigid outer casing surrounding said fuel reservoir, and movable parts in the said outer casing and adapted to cooperate with said yieldable sides of the reservoir to suck fuel into said reservoir below said opening.

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