

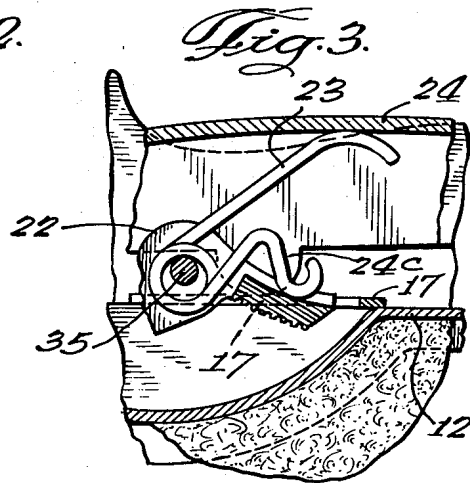
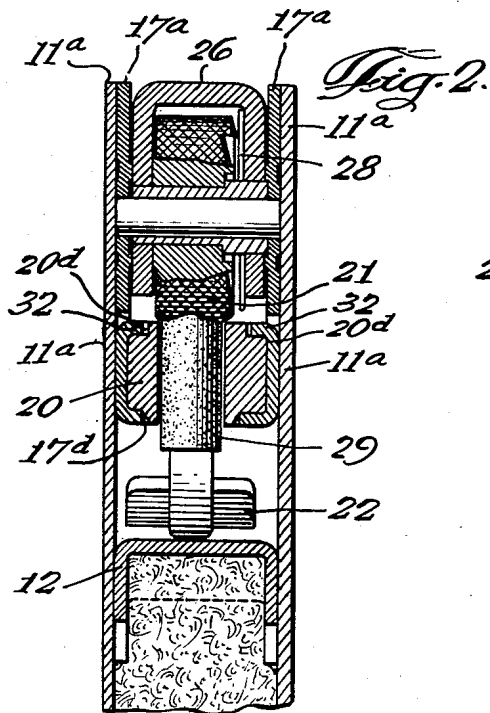
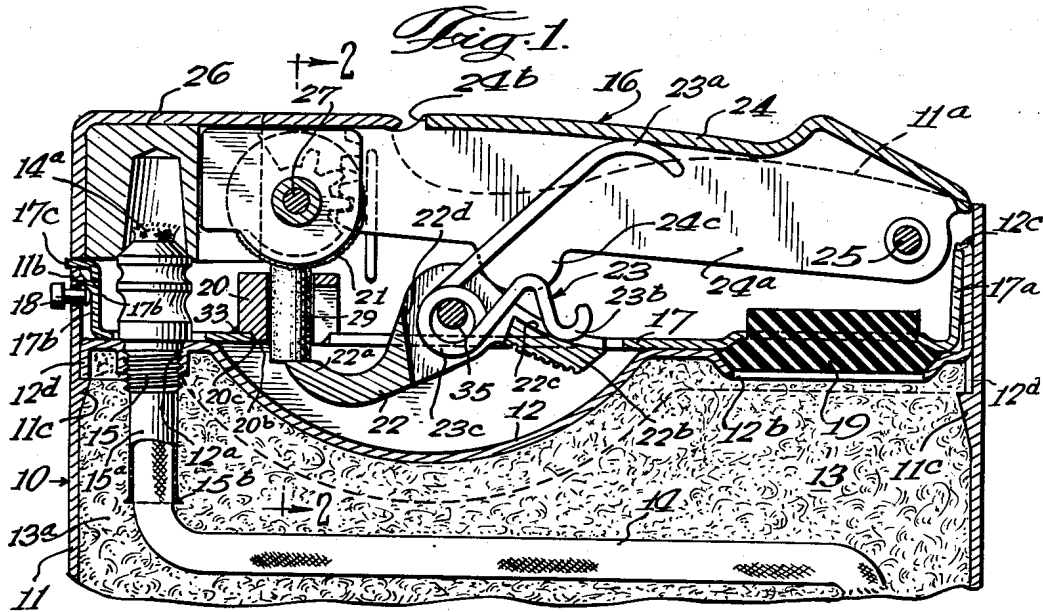
Aug. 23, 1960

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PYROPHORIC LIGHTER

2,949,758

Filed Oct. 31, 1955

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4.

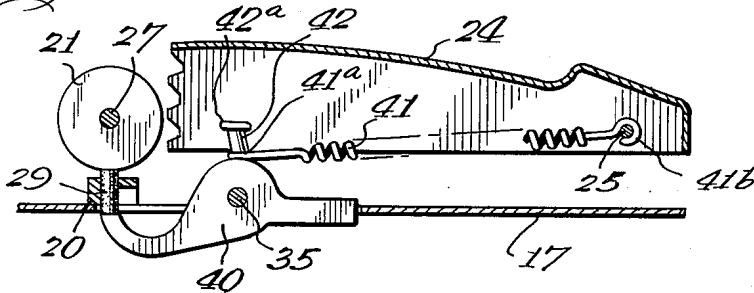


Fig. 5.

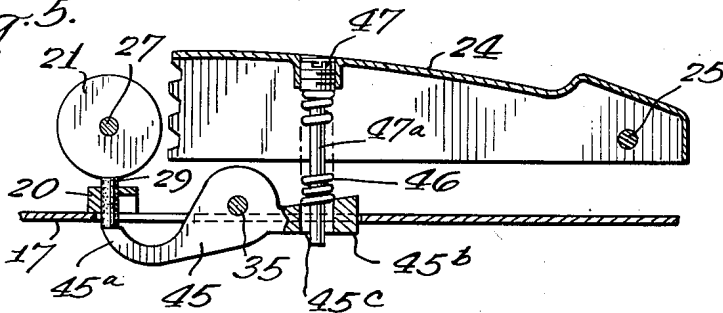


Fig. 6.

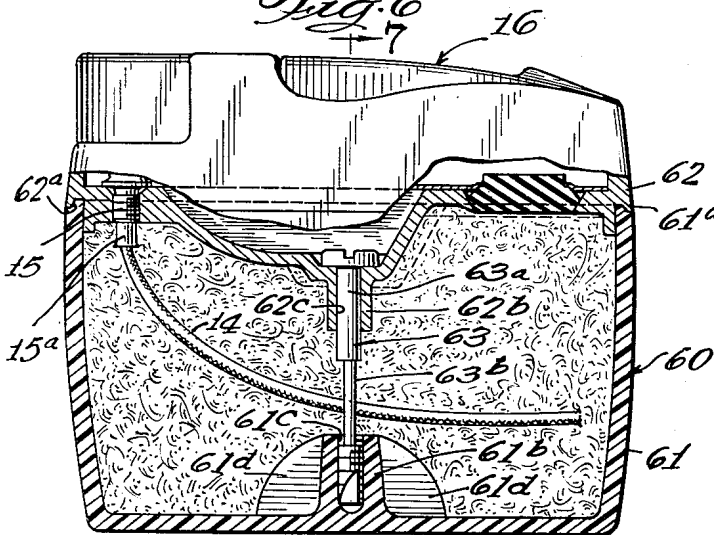
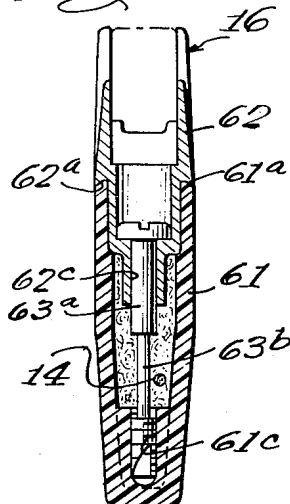


Fig. 7.



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2,949,758

**PYROPHORIC LIGHTER**

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Filed Oct. 31, 1955, Ser. No. 543,811

2 Claims. (Cl. 67-7.1)

This invention is concerned with an improved pyrophoric lighter.

This application is a continuation-in-part of copending Gellman application, Serial No. 444,492, filed July 20, 1954, now Patent No. 2,791,110.

One feature of the invention is that the lighter includes a snuffer element and a manually depressible operating element mounted on a frame, the arrangement being such that the snuffer element is raised when the operating element is depressed, and stop means are provided on the operating element, engaging the mounting frame on depression of the operation element for preventing the snuffer element from striking the operating element.

Another feature is the provision in a lighter of a support for a pyrophoric element including a base member having an opening therethrough, and a block member having a passageway therethrough for receiving the pyrophoric element, the members having interengaging portions for registering the opening and passageway, and means for securing the members together. A further feature is that the base member has upstanding sides between which the block member is positioned, the block member having a chamfered boss portion extending into the opening in the base, and a tab is struck from a side of the base member and bent into engagement with the top of the block for securing the members together.

Still another feature is the provision in a lighter of a body member having an open top, a deck member received within the open top, and means on at least one of the members for positioning the deck within the body.

Yet a further feature is the provision in a lighter of a casing adapted to contain a supply of liquid fuel and having an outlet opening therein, a quantity of absorbent material in the casing and a tubular extension concentric with the opening, for receiving a wick, and extending a substantial distance into the casing, preventing free liquid from draining out. Another feature is that the tubular extension projects at least into the absorbent material within the casing.

A further feature is the provision in a pyrophoric lighter of a follower for the pyrophoric element comprising an elongated lever pivotally mounted at a point intermediate the ends thereof, one end of the follower being adapted for engagement with the pyrophoric element, and a spring having two end portions and an intermediate point of flexure, one of the end portions bearing against the other end of the follower, the other end portion bearing against a surface in the lighter and the point of flexure being adjacent the pivotal point of the follower, whereby the point of contact of the spring on the other end of the follower moves away from the pivot as the flint wears away. Another feature is the provision of a follower which has a projection thereon, and a coil spring secured between the projection and a point in the lighter, the spring sliding outwardly on the projection away from the follower pivot as the flint wears away.

And another feature is the provision of a lighter casing

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comprising a body member having an open top, a closure member for the open top, the members having mating surfaces adapted for vapor-tight engagement and a screw holding the members together. A further feature is that there is a boss on one of the members having a bore therethrough, aligned with a recess in the other member, the screw extending through the bore of the boss and being aligned thereby for engagement in the recess. A further feature is that the center portion of the screw is relieved, providing clearance for the wick.

Further features and advantages will readily be apparent from the following specification and from the drawings, in which:

Figure 1 is a fragmentary vertical section of a lighter embodying the invention;

Figure 2 is a fragmentary sectional view taken along line 2-2 of Figure 1;

Figure 3 is a fragmentary detail view showing the operating member in the depressed position;

Figure 4 is a fragmentary view of a modified follower and spring;

Figure 5 is a fragmentary view of another modified follower and spring;

Figure 6 is a side elevational view, partially in section, of a modified lighter casing; and

Figure 7 is a sectional view taken along line 7-7 of Figure 6.

Turning now to Figures 1 and 2, the lighter includes a casing 10 for fluid, comprising a body member 11 having an open top within which a top deck 12 is secured defining a chamber 13 which is at least partially filled with an absorbent packing material 13a, as cotton. A wick 14, preferably of a woven cotton material, is disposed in the interior of chamber 13 and extends through the bore of an outlet fitting or wick boss 15 threaded in an opening 12a in the top deck. An opening 12b at the rear of the top deck permits the user to fill chamber 13 with a suitable fuel.

The side walls 11a of the body member 11 extend upward above the top deck 12 and receive telescopically therein a mechanical operating assembly indicated generally as 16. The mechanical assembly 16 is mounted on a cradle or frame 17 which is also provided with upstanding sides 17a, the configuration of the upper edge of the sides 17a preferably conforming with the configuration of walls 11a. The rear portion 17a of cradle 17 is turned upwardly for engagement with projection 12c formed in an up-turned portion of top deck 12, at the rear of the lighter. The forward end of cradle 17 is also bent upwardly at 17b and a spring catch portion 17b' is struck forwardly therefrom for engagement with an inwardly struck catch portion 11b in the wall of body member 11. A catch release button 18 may be pressed to disengage the catch portions 17b' and 11b, permitting the user to remove the mechanical assembly by lifting on outwardly bent tab 17c. A resilient plug 19 is carried by cradle 17 and seals filling opening 12b when the mechanical assembly is in place, preventing excessive evaporation of the lighter fluid.

A pyrophoric element or flint 29 is carried by a flint block 20 and is urged against abradant wheel 21 by a flint follower 22 under the influence of spring 23. An elongated operating member 24 is pivotally mounted on a pin 25, at the rear of the cradle, depression of the operating member causing rotation of snuffer cap 26 about pivot pin 27, uncovering the end 14a of the wick projecting out of the wick boss. A pawl plate 28 turns with the snuffer cap effecting rotation of abradant wheel 21, directing a spark from flint 29 toward wick end 14a. On release of the operating member 24 both it and the snuffer cap return to the position shown in Figure 1 under the operation of spring 23.

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Depressible operating member 24 is U-shaped in cross section, having depending flanges 24a (only one being shown in Figure 1) which fit inside the upstanding walls 17a of the cradle. In order to prevent excessive rotation of snuffer cap 26, that is rotation so far that it strikes the forward edge 24b of the operating member, a projection 24c is formed at the bottom of flange 24a, and forwardly of the center of the operating member, the projection striking the bottom surface of cradle 17, stopping the movement of the operating member after the snuffer cap has rotated slightly more than 90°.

The flint block 20 is provided with a downwardly extending boss portion 20b, the outer surface 20c of which is chamfered or tapered so that it will fit into an opening 17d in the cradle, positioning the flint block with respect to the opening and abradant wheel 21. A pair of tabs 32 are struck inwardly from the upstanding side walls of cradle 17 and are bent down into recesses 20d in the flint block to hold it in place until it can be affixed permanently to the cradle, as by soldering at 33. This greatly facilitates the assembly of the cradle and flint block as the walls 17a of the cradle extend upwardly approximately three times the height of the flint block on either side thereof making it difficult to hold the flint block in the desired position.

In order to simplify the assembly of the lighter, a step or shoulder 11c is formed in the interior wall of the body member, at least at the front and rear thereof. The top deck 12 is provided with a peripheral downwardly extending flange 12d which rests on the shoulder 11c placing the top deck at the proper level in the body member. The top deck may then be held in this position by any suitable means while it is soldered to the body member to affix the two permanently together.

Wick boss 15 is provided with a tubular extension or projection 15a which extends inwardly of chamber 13 at least far enough to reach the cotton packing 13a, which does not normally fill the chamber 13 completely. This prevents free fluid which may be present in the chamber 13, particularly after filling, from draining through the wick if the lighter should be placed upside down. Here, this fluid will collect in the area immediately around the wick boss extension 15a and cannot escape through the outlet opening, the liquid in the packing being held therein. The interior end of wick boss extension 15a is flared as shown at 15b to facilitate the insertion of the wick therethrough.

Flint follower 22 takes the form of an elongated lever pivotally mounted on a pin 35 at a point intermediate the ends of the lever. End portion 22a of the follower is finished at a suitable angle to engage the flint 29. The spring 23, which serves both as the flint spring and also as the operating member return spring, is roughly U-shaped in configuration and has a first end portion 23a which bears against the underside of operating member 24 and a second end portion 23b which rides in a groove 22c in the end 22b of the flint follower remote from the flint. A point of flexure for spring 23, indicated generally as 23c, is intermediate the ends thereof. The spring is preferably coiled at the point of flexure, the coil being wound about flint follower pivot pin 35. The follower is slotted at 22d to provide sufficient clearance for the spring. Thus, as flint 29 wears away, spring 23 will tend to straighten about point 23c (unwinding the coil) and the end 23b will slide outwardly in groove 22c away from pivot pin 35. This increases the mechanical advantage of the flint follower system and compensates, at least partially, for the decrease in spring force due to the approach of the spring toward its equilibrium position. It should be noted that when the lighter is operated, depression of the operating member compresses spring 23 increasing the force on the flint 29 after abradant wheel 21 has started to turn. This increases the spark output of the

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lighter but insures easy starting as the pressure of the flint on the wheel is the least at the start.

A modified flint follower 40 and spring 41 are shown in Figure 4, where the other elements of the lighter are given the same reference numerals as have previously been used. Here, flint follower 40 is provided with a projection or pin 42 which extends generally upwardly therefrom. Follower spring 41 is a coil spring which has an end 41a secured about pin 42 and the other end 41b attached to a fixed point as operating member pivot pin 25. With a relatively unworn flint in the lighter, the angle of pin 42 with respect to the axis of spring 41 is such that the end 41a of the spring is adjacent the flint follower. (This is the condition of the parts in Figure 4.) As the flint 29 wears away, follower 40 will turn clockwise about pin 35 and at some point the slope of the surface of pin 42 will be such that the end 41a of the flint spring will slide outwardly along the pin increasing the mechanical advantage of the system although the force exerted by the spring is decreased due to the flint wear. The outer end of pin 42 is enlarged at 42a to prevent the spring 41 from becoming disconnected therefrom.

A further modification of the flint spring and follower is shown in Figure 5 where the follower is designated as 45 and the flint spring 46. The end 45b of the flint follower, opposite the end 45a which bears against flint 29, is provided with an opening 45c. Flint spring 46 is a coil spring which extends between the end 45b of the flint follower and a set screw 47 in the upper surface of operating member 24. As the flint 29 wears away, set screw 47 may be adjusted by the user to increase the force of the spring exerted on the follower. Formed integrally with set screw 47 is a guide rod 47a about which coil spring 46 is placed, the guide rod extending into opening 45c of the follower insuring proper alignment of the parts.

Turning now to Figures 6 and 7, a modified casing structure particularly adapted for use with a plastic bodied lighter is shown. The operating mechanism 16 may be identical with that previously described and will not be discussed in detail. The casing, here designated as 60, comprises a plastic body member 61 and a top deck 62, preferably of metal. The body and top deck are secured together by a screw 63 and the engaging surfaces of the two members provide a tight seal. The upper peripheral surface of body member 61 is preferably formed with a wedge-shaped configuration 61a which is received in a complementary wedge-shaped or tapered groove 62a formed in the peripheral undersurface of the top deck 62. A boss 62b projects downwardly from the central part of top deck 62 and is provided with bore 62c in which the shank 63a of screw 63 is received. The bore 62c is aligned with a recess 61c in upstanding boss 61b molded in the bottom of plastic body member 61. Inasmuch as the interior of body member 61 is filled with cotton packing before the parts are assembled, it is important that the screw 63 be automatically aligned with recess 61c in order that the parts may be assembled easily. A pair of longitudinal fins 61d provide additional strength for boss 61b.

It is desirable in pyrophoric lighters that the wick be disposed throughout the length of the lighter. In order to do this with a thin lighter casing, such as that shown in Figures 6 and 7, the center portion 63b of the retaining screw is relieved to provide sufficient space for the wick to pass between the screw and the wall of the body member.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. In a pyrophoric lighter, support means of the char-

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acter described for a pyrophoric element, comprising: a base member having an opening therethrough and having upstanding sides; a block member having a passageway therethrough for receiving said pyrophoric element, said block having a chamfered boss portion extending into said opening positioning the block member on the base member with said opening and passageway in register, the sides of said base extending a substantial distance above said block; and a tab struck from a side of said base member and bent into engagement with the top of the block member for securing the members together.

2. Support means of the character described in claim 1 wherein the block member is provided with a recess in the top thereof to receive said tab.

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