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PYROPHORIC LIGHTER

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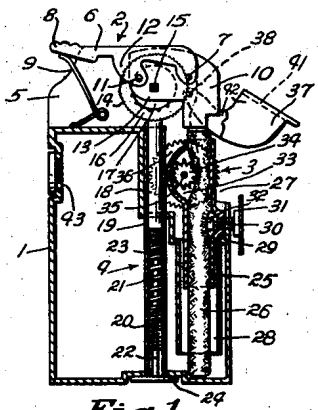


Fig. 1.

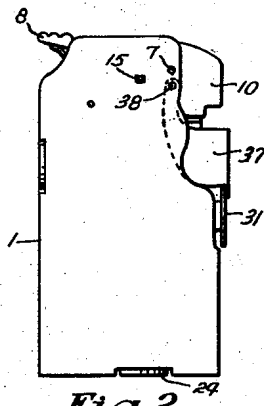


Fig. 2.

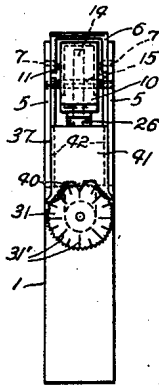


Fig. 3.

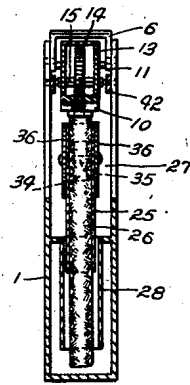


Fig. 4.

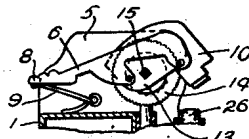


Fig. 5.

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# UNITED STATES PATENT OFFICE

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## PYROPHORIC LIGHTER

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2 Claims. (Cl. 67—7.1)

This invention relates to pyrophoric lighters. An object of the invention is to provide a lighter of simple structure having improved operating efficiency and readily actuatable means for promoting such efficiency.

A specific object is to provide an improved wick-holding structure adapted to permit ease of insertion of a wick thereinto, and convenient adjustment of the wick during use.

Another object is to provide a novel pyrophoric element supporting means adapted to assist the efficient and convenient operation of the lighter.

A further object is to provide a simple operating head for a lighter involving a minimum of moving parts whereby manufacturing costs are lowered and operating life is extended.

Other objects and advantages will be apparent from the description to follow, with particular reference to the accompanying drawing, in which

Figure 1 is a sectional side elevation,

Figure 2 is a side elevation,

Figure 3 is an end elevation,

Figure 4 is a transverse sectional elevation, and

Figure 5 is a partial side elevation.

Referring to the drawing, the lighter illustrated includes a main casing 1, an operating head 2, a wick-holding structure 3, and a pyrophoric element supporting means 4.

The operating head is mounted between two upwardly extending side wall portions 5 of the casing. A generally channel-shaped lever member 6 is pivoted at one end to the walls 5 by means of pins 7 and its other end is provided with a manually engageable knob 8 normally held in an upper position by a spring 9 mounted on the casing. A snuffer cap 10 is pivoted by means of pins 11 to ears 12 on the member 6, such ears being located substantially midway between the ends of the member. The snuffer cap 10 has a channel-shaped extension 13 into which extends a spark-producing wheel 14. The latter is mounted on a square shaft 15 which extends through the opposed walls of the channel portion 13 of the snuffer cap. The ends of the square shaft 15 are rounded and journalled in the side wall portions 5.

The spark-producing wheel 14 has a separate peripheral portion 16 with a serrated edge and an inner portion 17 adapted for rotation with the shaft 15. Suitable ratchet means (not shown) is provided to cause rotation of the peripheral portion 16 with the inner portion when the latter rotates in one direction but to permit the periph-

eral portion to remain stationary when the inner portion rotates in the opposite direction.

The serrated edge of the peripheral portion 16 has engagement with the end of a bar 18 of pyrophoric material, the supporting means for which includes a tube 19 extending downwardly to the bottom of the casing. The lower portion of the tube 19 is interiorly threaded for engagement with an exteriorly threaded sleeve 20. A spring 21 in the tube has one end bearing on the lower end of the pyrophoric bar and the other end bearing on the upper end of the sleeve. The latter is keyed to a shaft 22 for rotation therewith but in a manner permitting reciprocation with respect thereto. For this purpose the shaft may be square in cross-section and the sleeve may have a longitudinal bore to receive the shaft. The shaft has an enlarged head 23 at its upper end to provide a sleeve-engaging stop and a disc-like knob 24 at the other end for manipulation thereof. It will be observed that the shaft may be rotated to cause upward or downward movement of the sleeve and consequently to increase or decrease the tension of spring 21. Bearing pressure of the pyrophoric bar 18 on the spark producing wheel may be therefore conveniently adjusted whenever necessary in order to obtain efficient sparking. It will also be observed that the shaft 22 may at any time be withdrawn from the tube a distance equal to the distance between the upper end of sleeve 20 and the stop 23 on the end of the shaft. An indication of the amount of unused pyrophoric material in the lighter is thus conveniently afforded, since, assuming that the tension of the spring 21 is maintained substantially constant, the aforesaid distance will vary inversely with the length of the pyrophoric bar. The desired tension of the spring, i. e., that at which efficient sparking takes place, may be maintained with little variation by adjustment of the sleeve 20.

The wick-supporting structure 3 includes a tube 25 through which the wick 26 extends. The tube 25 with the wick is removably mounted in the casing, the upper portion of one side of the casing being open as indicated at 27 for easy access to the structure. The lower portion of the tube 25 is adapted to fit into a second tube 28 mounted in the casing. A shoulder portion 29 on the tube 25 engages the casing, as shown, to position the structure in the casing. A screw 30 mounted in the shoulder 29 and having a head 31 for more rigid positioning of the structure. Means, conveniently associated with the screw 30, may be provided to apply pressure on the

wick at this point to adjust or prevent conduction of liquid fuel by the wick. Such means comprises a clamping member 32 swivelly mounted on the end of the screw. Rotation of the screw will increase or decrease the pressure of the member 32 on the wick. Thus, the amount of fuel conducted to the end of the wick may be adjusted for most efficient operation of the lighter. Moreover, when the lighter is not in use, evaporation of fuel may be substantially prevented by adjustment of the clamping means to cut off substantially the flow of liquid fuel through the wick. The head 31 is conveniently formed as a serrated disc, the face of which may be provided with graduated markings 31' to indicate the degree of pressure which may be applied as desired to the wick. A cover member 37 has a front wall 41 and a pair of side walls 42 hinged to the casing at 38. The cover member has downwardly extending lugs 39 adapted to overlie and engage portions of the head 31 to resist unintentional rotation of the head. A pointer 40 may be provided on the cover member to cooperate with the markings 31'.

Means for conveniently adjusting the position of the wick in the tube is provided and comprises a housing 33 formed by an enlargement of the tube, a wick-engaging pricker wheel 34 in the housing fixed to a shaft 35 journaled in the walls of the housing, and a pair of wheels 36 outside the housing fixed to the ends of the shaft. The wheels 36 have serrated edges to permit ease of manual rotation thereof. It will be observed that the wheels 36 are of relatively large diameter and project well beyond the adjacent casing walls. Thus, they are conveniently accessible for manual rotation. Such rotation moves the wick upwardly or downwardly in the tube to adjust the amount of wick projecting from the end of the tube for lighting purposes, as desired.

The walls of cover member 37 constitute a casing for the wick adjusting mechanism, which casing may be readily swung upwardly to permit access to such mechanism, as shown in Figure 1.

Fuel may be supplied to the casing through the opening 43. The casing may contain the usual packing of fuel absorbent material in contact with the wick.

Referring to Figure 5, it will be observed that in operation of the lighter, downward movement of the member 6 about its pivot 7 will move the inner end of extension 13 downwardly to elevate the snuffer cap out of contact with the end of the wick. Such movement of the cap will cause rotation of the inner portion 17 of the spark producing wheel 14, the ratchet mechanism previously referred to being such that, during such rotative movement, the peripheral portion 16 rotates therewith to engage frictionally the pyrophoric bar 18 and cause sparks to ignite the wick. On release of the member 6, spring 9 causes upward movement of the same and downward movement of the snuffer cap into engagement with the end of the wick. The resulting opposite rotative movement of the portion 17 of the wheel 14 does not cause rotative movement of the peripheral portion 16, as previously described.

It will be apparent that various changes in the lighter described and in the structural details of the several parts thereof may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In a pyrophoric lighter a substantially rectangular casing, a fuel compartment and an auxiliary chamber within the casing, a wall separating the fuel compartment from said chamber and having a horizontally disposed shoulder defining the lower end of the chamber, a socket in said shoulder, a removable wick-carrying unit freely mounted in said socket, said casing having a cut away portion in one corner to provide a recess exposing said chamber and the wick-carrying unit therein and a channel shaped door member pivoted at the top of the casing for closing and opening said recess.

2. A lighter as defined in claim 1 wherein said wick-carrying unit comprises a wick supporting tube and means for adjusting the position of a wick in the tube comprising a wick engaging pricker wheel, a housing therefor adjacent the upper end of the tube, a shaft journaled in the housing and carrying said wheel and manually rotatable means fixed to the shaft and located externally of the housing for actuating said pricker wheel.

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