

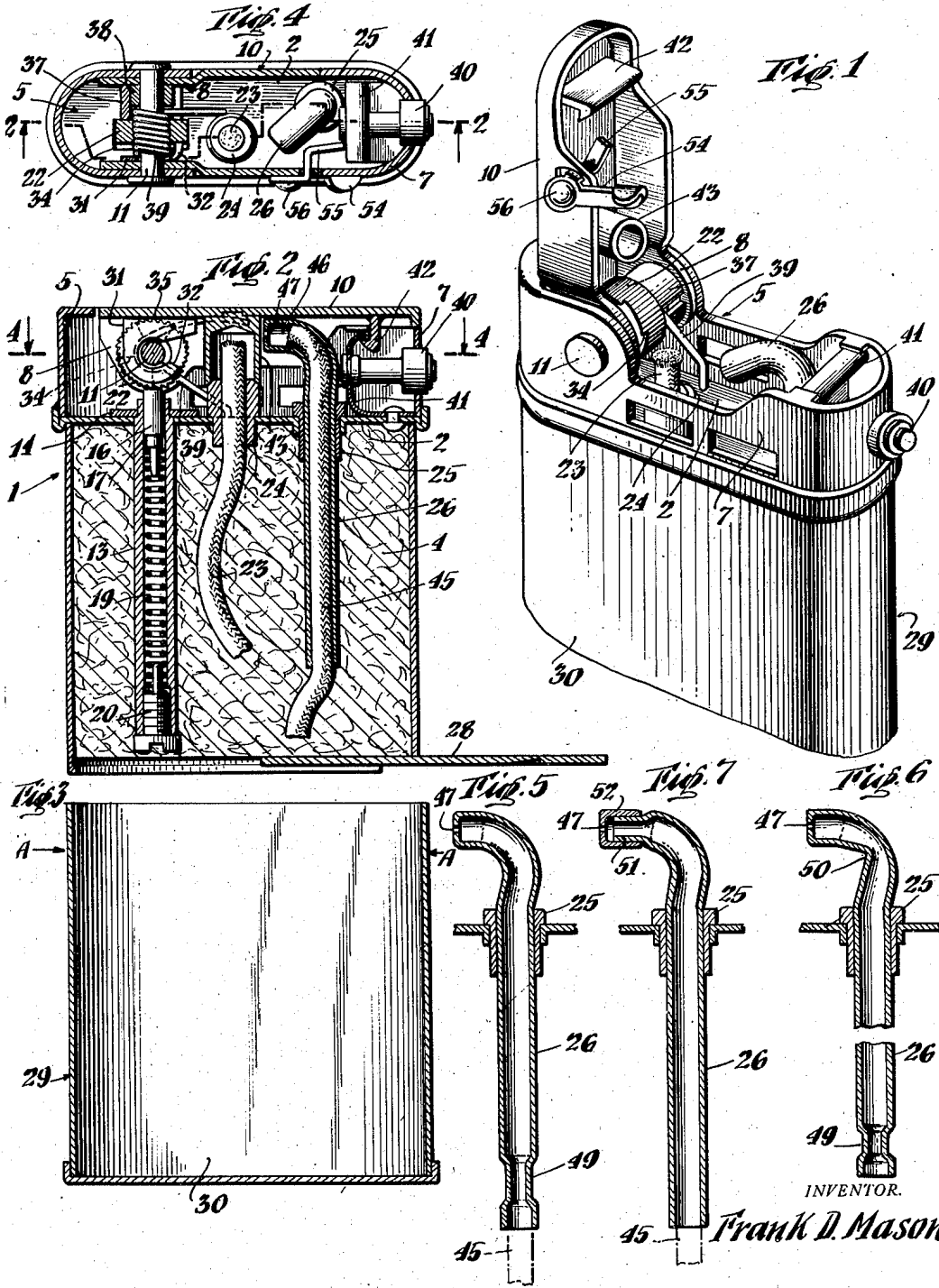
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POCKET LIGHTER

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POCKET LIGHTER

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The present invention relates to pocket lighters and more particularly to a pocket lighter for generating a jet of flame.

Numerous pocket lighters have been developed, and many of them have proven satisfactory for use in the lighting of cigarettes and cigars where a lighter may be held beneath the end of the cigarette with the tip of the cigarette in the flame. Lighting a pipe, however, presents a different problem for it is not as easy to hold the tobacco in the pipe bowl exposed to a flame as with a cigarette; the pipe bowl surrounds the tobacco and the latter is not as accessible to the flame. The bowl of a pipe contains a relatively large volume of tobacco which must be ignited, and hence it is desirable that the flame play over the tobacco for a sufficient period of time to thoroughly ignite it. It is desirable that one hand of the smoker be left free to steady the pipe, and hence the lighter should be one which is operable with a single hand. Previous lighters have presented various objections, and a pipe smoker has had to struggle along with them or with ordinary matches.

The present invention aims to overcome or minimize the above and other difficulties by providing an improved pocket lighter which may be operated by one hand of a user and with which it is possible to direct a flame into a pipe bowl for a sufficient period of time to thoroughly ignite the tobacco in the bowl. In addition, the present lighter may be used to ignite cigars and cigarettes.

An object of the present invention is to provide a new and improved pocket lighter.

Another object of the invention is to provide an improved pocket lighter which can be used to ignite tobacco in smoking pipes.

Another object is to provide an improved pocket lighter which may be operated with a single hand.

A further object is to provide an improved pocket lighter which is adapted to direct a jet of flame into a pipe bowl.

A still further object is to provide a pocket lighter adapted to furnish a jet of flame for a sufficient period of time to thoroughly ignite the tobacco in a pipe bowl.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

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A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawing, forming a part of the specification wherein:

Fig. 1 is a perspective view showing the upper portion of the present lighter;

Fig. 2 is a sectional view through the lighter shown in Fig. 1;

Fig. 3 is a sectional view of an outer case for the lighter shown in Fig. 2;

Fig. 4 is a sectional view taken along the line 4-4 of Fig. 2;

Fig. 5 is a sectional view through a flame jet tube;

Fig. 6 is a sectional view showing the upper part of flame jet tube; and

Fig. 7 is a longitudinal sectional view through a modified form of flame jet tube.

Referring more particularly to the drawings, there is shown a pocket lighter comprising a case 1 divided by a horizontal partition 2 into a lower fluid container compartment 4 and an upper compartment 5 adapted to contain the mechanism for igniting and extinguishing the lighter. A wall or wind guard 7 extends around the upper part of the lighter and has flanged portions 8 of a lid 10 movably secured thereto by a pin or shaft 11. The wind guard 7 minimizes objectionable flickering of a flame and also possibly burning the hands of a user during such times as the lighter is ignited. A flint tube 13, located within the lower fluid chamber 4 and extending through the platform or horizontal partition 2 and securing washer 14, contains a flint 16 seated against a plunger 17. The plunger 17 is in turn maintained in upward position by a spring 19 which rests against the end of a screw 20 threaded into the lower end of flint tube 13. A roughened flint wheel 22, carried by the same shaft or pin 11 which passes through the flanges of the lid 10 holds the flint downwardly in the flint tube against the upward thrust of the spring 19.

The flint and wheel are adapted to cooperate to provide sparks for igniting a wick 23 which extends through a bushing 24 in the platform 2. Suitable inflammable or volatile liquid passes through the wick 23 from the lower chamber 4 by capillary attraction. An additional bushing 25 secured to the horizontal platform is adapted to retain in position a flame jet tube 26 which will be more fully described hereinafter.

The lower liquid containing chamber 4 may be filled with cotton or like material to absorb the lighter fluid and to release it gradually as it is

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consumed by burning at the upper end of the wick 23. The lower liquid chamber may be filled through an opening provided by moving the lower slide cover 28 to some such position as shown in Fig. 2; utilization of the slide cover 28 facilitates rapid and easy filling of the lighter as it is not necessary to first remove any screws and the opening thus provided is relatively large. When the slide cover 28 is in closed position, an outer casing 29 shown in Fig. 3 may be telescoped over the casing 1. Preferably the sidewalls 30 of the outer casing are bowed inwardly very slightly so as to frictionally grip against the exterior of the inner casing 1; with this construction the cover may be readily removed from the inner casing 1 by pressing inwardly against the said edges of the outer casing 29, as indicated by the arrows A shown in Fig. 3. This minimizes the grip of the sidewalls 30 against the inner casing and they may be readily separated.

It was pointed out hereinabove that the flint wheel 22 and lid 10 are mounted on the same shaft 11, and they are preferably operatively connected so that movement of the lid to open the lighter is effective to rotate the flint wheel and cause sparks to fly from the flint 16 against the end of the wick 23 to ignite the inflammable liquid carried by it. As shown, rotation of the flint wheel 22 is achieved by a relatively flat spring ratchet 31 that extends around the shaft 11 and has a resilient ear or tab 32 projecting out of the plane thereof toward ratchet teeth or projections 34 at one side of the flint wheel 22. One edge 35 of the spring ratchet 31 is preferably straight and extends closely along the under side of the lid 10 so that movement of the lid is effective to press against and rotate the spring ratchet 31 about the shaft 11. The flint wheel 22 is held over the flint 16, against the spring ratchet 31, and in alignment with the wick 23 by a slit bushing 37 positioned over the shaft 11 intermediate the opposite side of the flint wheel 22 and a flange 8 on the lid 10; a smaller inner bushing 38 may be fitted over the shaft 11 and into the interior of the slit bushing 37 to minimize excessive transverse movement of the latter bushing with respect to the shaft 11. Any suitable number of teeth 34 may be utilized at the side of the flint wheel but either three or five teeth have been found to work well in actual practice.

Rapid upward movement of the lid 10 is obtained by a coil spring 39 which extends around the pin or shaft 11 and has one end thereof resting against the horizontal partition 2 and the other end thereof pressing against the underside of the lid 10 to urge it upwardly at all times toward the open position illustrated in Fig. 1 of the drawing. The lower leg of this spring 39 preferably passes freely through the slit in the bushing 37. When the push pin 40 is moved inwardly in opposition to the resilient locking member 41, the upper end of the latter member moves off the ledge of a catch 42 secured to the under side of the lid and the coil spring 39 causes the lid to fly quickly upwardly. A cap or snuffer 43 secured to the underside of the lid uncovers the upper end of the wick 23. Rotation of the flint wheel against the flint 16 is effective to ignite fluid carried by the wick 23 and the flame from the thus ignited wick may be used to light a cigarette or cigar in the usual manner.

Accidental opening of the lid 10 may be minimized by a lock or catch secured by a pin 56 to one flange of the lid. A leg 55 of the lock is adapted to be moved into alignment (Fig. 4) with

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the resilient locking member 41 to prevent inward movement thereof upon pressing the push pin 40 inwardly. The exteriorly positioned leg 54 of the lock may be moved in clockwise direction to rotate the end of the interior leg 55 out of alignment (Fig. 1) with the resilient locking member 41 and to thus permit operation of the latter in the usual manner by the push pin 40.

Located adjacent the top of the wick 23 is the upper end of the flame tube 26, previously mentioned, which may be used to provide a jet of flame suitable for igniting the tobacco in a smoking pipe. The flame tube 26 and its action will now be described.

When the pocket lighter is tilted slightly in an appropriate direction, flame from the ignited wick 23 will play upon and heat the upper end of the flame tube 26. Heating this tube to a sufficient degree apparently causes liquid in a wick 45 therein to vaporize into the chamber or volume 46 shown at the upper part of the flame tube. The heating effect probably causes the pressure in the volume 46 to increase and the gases formed in this volume endeavor to escape by passing outwardly through the small hole or aperture 47 in the flame tube and also by passing downwardly through the wick 45 and between the wick 45 and the walls of the flame tube 26. Resistance to rapid escape of pressure down through the flame tube is provided by extending the flame tube and wick a substantial distance into the liquid chamber 4. By "substantial distance" it is meant that the flame tube extends below the mid-point, and preferably to about three-quarters of the depth of the chamber 4. The resultant resistance to escape or venting of pressure into the liquid container 4 facilitates exit of the compressed air and volatile gases through the small aperture 47 at the upper end of the flame tube. As the gases emerge from the aperture they are ignited by the flame from the wick 23 and projected outwardly at an angle. The jet of flame may be directed into the open bowl of a pipe.

For optimum results the wick 45 should be of closely woven material and it should fit into the tube 26 with a reasonably close fit. The close weave and fit probably minimize escape of pressure down the flame jet tube.

With the resistance to escape of gases down through the flame tube 26, it is possible to utilize a very small aperture 47 at the upper end of the flame jet tube and to thus facilitate egress of inflammable gases for a considerable period of time, hence there is provided a flame jet which continues for an ample period of time to ignite a pipe of tobacco. The jet provided is relatively long and easily projectable into the bowl of a pipe. While the size of the chamber 46 at the upper part of the flame jet tube may be varied by suitably positioning the wick 26 in the tube, it is preferably of the approximate size indicated in the drawings.

In Fig. 5 the flame jet tube is shown provided with a constriction or necked-in portion 49 extending about the tube adjacent the lower part thereof. The constriction may be rolled or otherwise suitably formed in the tube, and it is preferably so formed after the wick has been inserted into the tube, as this facilitates manufacturing operations. A tube provided with a constricted portion as illustrated in this figure furnishes a flame jet which endures for a considerable period of time; it is believed that the theory of operation of the restriction shown in this figure is that it minimizes loss of "back pressure" down through

the tube as the wick and the upper part of the tube are heated to volatilize the liquid in the wick and cause an increase in pressure in the tube.

In the form illustrated in Fig. 6 of the drawing, the curved neck of the tube is shown provided with a constriction or restriction 50. As the upper part of this flame jet tube is heated by a flame from a wick, the liquid in the wick volatilizes and escapes through the open end aperture and rapid loss of back pressure down through the flame jet tube is minimized by reason of the constriction formed at the neck of the tube.

With either the form of constriction illustrated in Fig. 5 or the form illustrated at the upper part of Fig. 6, a shorter length of flame jet tube may be utilized due to the fact that the loss of back pressure is minimized by the restricted portions of the tubes rather than by the relatively great length of tube.

Actually it is preferable that the same flame jet tube be provided with both the constriction 49 illustrated at the lower part of Fig. 5 and also with the constriction 50 illustrated at the bend at the upper part of Fig. 6. The two constrictions cooperate; as the upper end of the tube is heated by a flame, leakage or loss of pressure back through the tube is minimized, first, due to the restriction 50 at the bend in the neck, and secondly, by the constriction 49 at the lower part of the tube. Thus, the pressure which the lower restriction 49 tends to maintain in the flame jet tube provides what may be termed a "continuous" action, as contrasted with the "quick" action provided by the constriction 50 at the curved upper part of the flame tube.

In Fig. 7 there is illustrated a modified form of flame jet tube wherein the reduced upper end 51 of the tube is provided with a separate cap 52 which fits over the reduced end of the tube. The cap 52 may be applied in any suitable manner; for example, it may be force-fitted over the end of the tube 26 and retained in place by friction or it may be screwed onto a threaded end of the tube 26. This construction may be preferable in some instances as an aid to manufacturing operations.

It will be seen that the present invention provides a new and improved pocket lighter adapted to be operated with one hand and which provides a flame jet useful for igniting a pipe of tobacco. The jet of flame formed by the new and improved flame jet tube is of ample length to project from the lighter into a pipe bowl and the jet is capable of enduring for a period of time amply sufficient to allow a smoker to obtain thorough ignition of his pipe of tobacco.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In a pyrophoric lighter of the class described having a fuel reservoir and a wick in communication with said reservoir and means adapted to ignite fuel on a portion of said wick, a flame jet tube adjacent said wick having an upper end closed except for a pinhole-like aperture and adapted to be heated by said ignited wick and having a portion extending through a reservoir

wall into said fuel reservoir, the interiorly disposed portion of the jet tube being of lesser length than the depth of said reservoir, a wick in said jet tube, and a wall portion of said jet tube projecting annularly inwardly beyond the normal diameter thereof and pressing circumferentially inwardly against the wick located in said jet tube.

2. In a pyrophoric lighter of the class described having a fuel reservoir and a wick in communication with said reservoir and means adapted to ignite fuel on a portion of said wick, a flame jet tube adjacent said wick having an upper end closed except for a pinhole-like aperture and adapted to be heated by said ignited wick and having a portion extending into said fuel reservoir, the interiorly disposed portion of the jet tube being of lesser length than the depth of said reservoir, a wick in said jet tube, a wall portion of said jet tube projecting annularly inwardly beyond the normal diameter thereof and pressing circumferentially inwardly against the wick located in said tube, and a wall portion of said jet tube projecting inwardly beyond the normal diameter thereof at a location spaced from said annular inward projection and pressing inwardly against the jet tube wick at said location.

3. In a pyrophoric lighter of the class described having a fuel reservoir and a wick in communication with said reservoir and means for igniting fuel on said wick, a flame jet tube adjacent said wick having an upper lateral portion closed except for a pinhole-like aperture and adapted to be heated by flame from said wick and having a body portion extending downwardly at an angle from said lateral portion and projecting into said fuel reservoir, the interiorly disposed portion of the jet tube being of lesser length than the depth of said reservoir, a wick in said jet tube, an inwardly projecting tube wall portion forming an opening of reduced cross sectional area through said tube substantially at the location where the lateral portion of the tube forms said angle with the body portion thereof, and a wall portion of said tube projecting circumferentially inwardly with respect to adjacent jet tube wall portions and exerting concentrated circumferential pressure against a portion of the wick in said jet tube.

4. A pyrophoric lighter as claimed in claim 3, in which a portion of the walls at said angle are flattened to form said opening of reduced cross section.

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