

Dec. 6, 1949

H. R. MONTAGUE

2,490,082

LIGHTER FOR PIPES AND CIGARETTES

Filed June 16, 1945

2 Sheets-Sheet 1

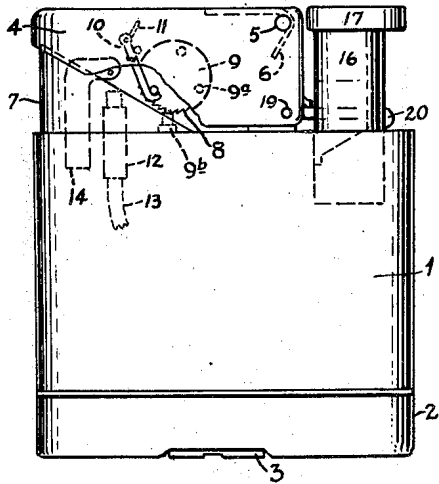


Fig. 1

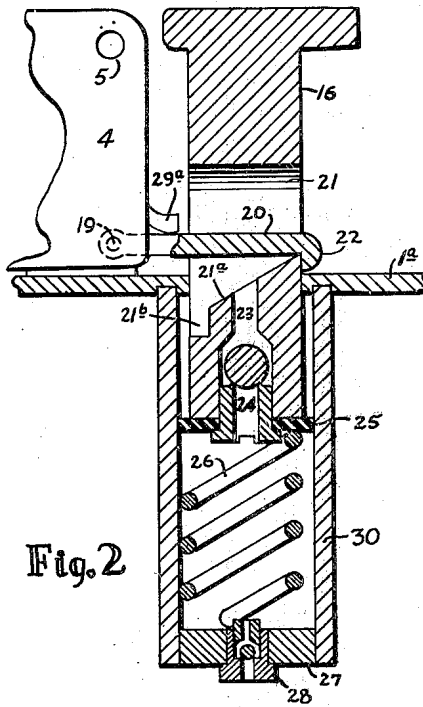


Fig. 2

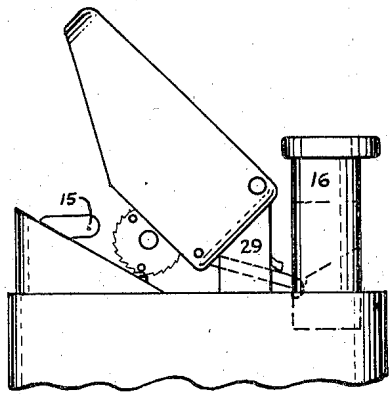


Fig. 3

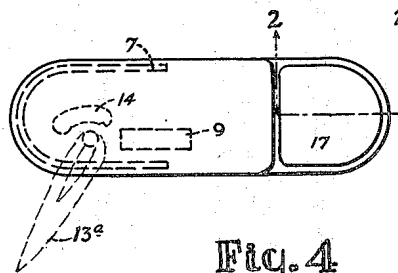


Fig. 4

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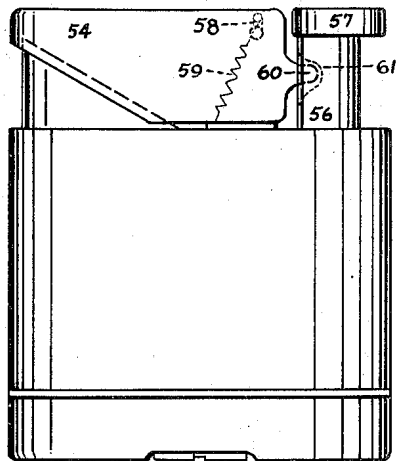


Fig. 5

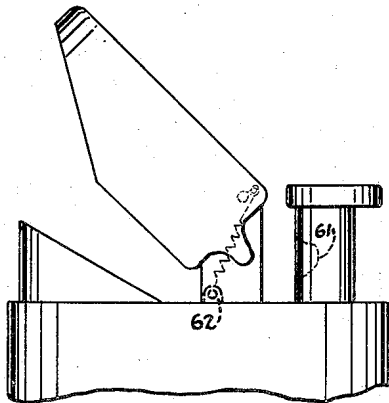


Fig. 6

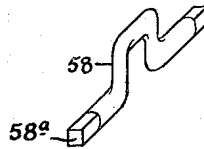


Fig. 7

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UNITED STATES PATENT OFFICE

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LIGHTER FOR PIPES AND CIGARETTES

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8 Claims. (Cl. 67-7.1)

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This invention relates to lighters, particularly to the small pocket type carried by tobacco users for lighting cigars, cigarettes and pipes.

It is an object of my invention to provide such a lighter which is particularly adapted to the lighting of either pipes or cigarettes at will, which can be manipulated by one hand without the necessity of changing the position of the lighter in the hand to perform the various operations of striking, lighting and closing, which is fast and convenient in operation, economical of fuel, simple in construction, neat in appearance and inexpensive to manufacture.

Ordinary pocket lighters adapted to the lighting of cigars and cigarettes produce a vertically directed flame, as from a wick, which is almost useless when lighting a pipe, since regardless of the position in which the lighter is held, the flame projects upward; whereas for pipe lighting, the flame should be capable of being directed horizontally across the bowl of the pipe, or downward into the bowl.

Attempts have been made to make a satisfactory pipe lighter on the principle of a blow torch, the flame from the usual wick serving to heat a vaporizer tube having a small orifice through which a jet of fuel vapor issues across the flame from the wick, the resulting horizontal needle-like composite flame being capable of direction into or across the bowl of the pipe. This ingenious idea has several disadvantages in practice. First, a considerable time is required for the vaporizer jet to begin to function, resulting in slow action. Second, the whole device becomes hot as a result of heat conducted along the vaporizer tube into the main body of the device; this results in discomfort as well as waste of fuel, since the higher vapor pressure of the heated fuel in the body of the lighter increases the loss through any leaks in the device. Third, there is no control of the jet by the operator, which means that the jet uses up fuel even when the device is used for cigars and cigarettes, though the jet is not required for such uses; further, the needle-flame is not well adapted to lighting cigars and cigarettes, and has an element of danger when the lighter is offered lit, to one who is unfamiliar with the fact that a jet will automatically be produced after a certain time. Fourth, the vaporizer tube does not cool down immediately when the flame is snuffed out, so that vapor continues to issue from the jet for a certain time, and such vapor wasted.

A further object of my invention is therefore to provide a lighter overcoming all of the above

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noted objections. My invention will best be understood by referring to the accompanying drawings, in which Figure 1 is a vertical elevation of one form of improved lighter, in closed position with a part broken away, Figure 2 is an enlarged vertical view partly in section, principally of the pump mechanism, the sectional portion being taken on line 2-2 of Figure 4, Figure 3 is a fragmentary view similar to Figure 1 but showing the lighter open, Figure 4 is a top view of the same lighter showing the jet flame direction, Figure 5 is a view similar to Figure 1 of a second form of lighter, Figure 6 is a fragmentary view of this form of lighter in open condition, and Figure 7 is a perspective view of one element of the lighter shown in Figure 5.

In general, I accomplish the objects of my invention by constructing a lighter which has the usual provisions for producing a flame by spark ignition of a fuel-bearing wick. A jet-producing tube is arranged behind the position occupied by the flame, but so as not to lie within such flame. Fuel vapor is forced through this tube from the usual fuel compartment by a manually operable pump which pumps atmospheric air into the fuel compartment. In accordance with my invention, the piston of the pump is also linked to the igniting device so that the lighter is opened and ignited by the initial depression of the pump, after which, successive operations of the piston produce sufficient pressure within the fuel chamber to maintain a steady jet of flame, directed approximately horizontally in the normal position of the lighter. Thus the jet is produced only when required, as when it is desired to light a pipe, but does not represent a waste of fuel when it is desired merely to light a cigarette or cigar, or after the lighting of a pipe has been satisfactorily completed. Also, since the jet tube is not heated in the flame, the whole device remains cool during and after the lighting operations.

Referring now to Figure 1 of the drawings, 1 represents the main body or fuel chamber of the lighter, and is of usual construction, containing the supply of fuel (usually soaked in cotton wadding) and provided with a tightly fitting bottom closure 2 removably secured as by a screw 3. The top of chamber 1 is closed by a plate 1a upon or through which the principal operative parts are mounted. These include a cover 4 hingedly mounted at 5 and carrying a pivoted catch 10 biased by a spring 11 to engage projections 9a on a toothed striking wheel 9 rotatably mounted on the cover plate 1a. The usual flint carrying tube 9b is mounted in the cover

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plate just beneath the wheel 9 and extends into chamber 1, its other end being closed by a screw to maintain pressure on a spring (not shown) which thus holds the flint against the wheel. The usual wick 13 is contained in hollow tube 12 passing through the top plate. Tube 12 is of such an inside diameter as to tightly grip the wick, to minimize any loss of pressure through said wick, while permitting the passage of liquid fuel by capillary action.

A hollow tube 14 also passes through the plate 1a and curves behind the wick tube as more clearly shown in Figure 4. The outer end of this tube is closed, but has a small orifice 15 so arranged as to produce a jet across the flame from the wick, when the pressure in chamber 1 is raised. A spring 6 biases cover 4 upward, and in operation, the opening or raising of cover 4 acts, through catch 10, to spin wheel 9 and ignite the wick. The usual close fitting wick-sealing lid may be mounted on cover 4 to prevent evaporation of the fuel when the cover is closed.

The means by which cover 4 is normally maintained in its closed position, and released to strike a flame, will now be described. Referring to Figure 2, a hook 20 is pivotally mounted on cover 4 and extends rearwardly therefrom, terminating in a round end 22. This hook can pass through a piston 16 by means of a central slot 21 therein. The hook extends clear through the piston and catches thereon as shown in Figure 2. It is clear that downward movement of the piston, as by pressure of the thumb upon its top button 17, will release the hook and allow cover 4 to raise, lighting the wick and pulling the hook 20 through slot 21 to the position shown in Figure 3.

It is also clear that, since piston 16 is biased upwardly by a spring to be described, cover 4 may be pressed downwardly by the same thumb which earlier depressed piston 16, whereupon catch 10 will snap behind one of the projections 9a and, upon completion of the closing movement, hook 20 will pass through slot 21 and snap behind the far edge thereof, latching the cover down. It will be observed that the travel of hook 20 is constrained to be substantially horizontal by reason of a lug 29a secured to the journal structure 29.

Pressure in chamber 1 to produce the jet is furnished by the pump shown in Figure 2. Pump barrel 30 is secured to plate 1a and projects downwardly therefrom, lying within the chamber. Its lower end is closed by a plug 27, in a central bore of which is a ball valve 28. Piston 16 has a similar valve 24 at its lower end, controlling the ingress of air through bore 23 in the piston. As soon as the piston 16 starts its downward travel, the initial rush of air upward through valve 24, augmented by the inertia of the ball in such valve, seats the valve ball against the conical valve seat thereabove, and the remainder of the down stroke of the piston hence forces air through normally open valve 28 into chamber 1. When piston 16 begins its up stroke, the excess of pressure in chamber 1 over that within the pump barrel lifts the ball of valve 28 against its conical seat, preventing escape of the air just compressed into chamber 1. However, as the piston rises, the excess of atmospheric pressure over that obtaining within the pump barrel unseats the ball of valve 24, allowing air to enter the pump through bore 23 in preparation for the next down stroke. Fig. 2 of the drawings illustrates the lighter in its quiescent position in which gravity holds the check valve balls away from their respective conical seats, it being understood that

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the orifices upon which they then rest are so formed as not to be sealed against the passage of air downward past the balls. The head of valve 24 may also serve to secure a resilient washer 25 which may be of leather or the like to form a good seal between the piston and the barrel. I have found that the ball valves operate very well without any springs biasing the balls to closed position, although such springs may be provided if desired. A spring 26 operates to bias piston 16 to its uppermost position.

It will be observed that the bottom edge 21a of slot 21 is cut at an angle to the axis of the piston. This construction enables the piston 16 to have a longer effective stroke, since, as shown in Figure 3, the piston can rise to a level at which end 22 of hook 20 lies in recess 21b of the bottom edge of the slot. Retraction of the piston by hook 20 provides automatic levelling of the top of the lighter when the lighter is closed by pressure on cover 4.

The operation of the lighter described above is very simple. It is held in the hand with the user's thumb lying on button 17, and pressure is applied thereto. Upon the initial downward movement of piston 16, hook 20 is unlatched, and cover 4 springs open, causing the lighting of the wick. Piston 16 can now be operated up and down, a few strokes creating sufficient pressure in chamber 1 to produce the jet flame shown in dash lines in Figure 4. As soon as the lighting operation is concluded, all that is necessary is to move the thumb from button 17 over to cover 4, pressing it down, whereupon hook 20 moves to the right (Figure 3), its rounded end 22 camming piston 16 down to its Figure 1 position, and ultimately latching the cover closed, with the parts aligned as in Figure 1 to present a neat profile.

As described, the complete cycle of operations is achieved without altering the position of the lighter in the user's hand. Also, it will have been observed that the jet is fully under control in that if, say, a cigarette is to be lighted, the user merely refrains from operating piston 16 after the first slight unlatching movement. There is thus no waste of fuel, or danger that an inexperienced user will be exposed to an undesired jet of flame while lighting a cigarette.

Many other features may obviously be incorporated in the lighter herein described. For example, I have illustrated the left end of cover 4, in Figure 1, as chamfered to fit over an inclined wind screen 7 mounted on the top plate 1a. Such wind screen facilitates use of the lighter out of doors, and may be either solid or perforated as is well known in the art.

While the lighter described above satisfactorily accomplishes the objects of my invention, it has two minor potential disadvantages: First, the hair-trigger action may result in inadvertent lighting when button 17 is accidentally struck, and second, wear of certain of the parts after long use may permit the cover to gap open rather than to remain tightly closed. I have found that both of these objections may be overcome by a modified design of lighter, which is also considerably simpler in construction.

The modification illustrated in Figures 5 to 7 of the drawings consists of using an over-center spring for biasing the cover, but is otherwise similar to the form already described. As shown in Figure 5, a crank 58 having squared ends 58a as shown in Figure 7, is fixedly mounted in cover 54, and serves to pivotally mount said cover in its trunnions. The cranked central portion of mem-

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ber 58 is connected to a coil spring 59 the other end of which is secured to the top plate, as at 62. The angulation of crank 58 is such that, when cover 54 is pushed down, spring 59 tends to maintain it in this position. When, however, cover 54 is raised through an angle of about ten degrees, the spring 59 passes across the axis of rotation of the cover, and thereupon the spring drives the cover up, lighting the wick just as in the first form of the invention.

As shown in Figure 5, the piston 56 in this form is not slotted clear through, but has a curved-bottom slot 61 similar to a Woodruff keyway. The back plate of cover 54 has a rounded protuberance 60 which enters slot 61 when the lighter is closed. Thus, when piston button 57 is initially depressed, the piston moves protuberance 60 clockwise, raising cover 54 sufficiently for spring 59 to drive it the rest of the way. After lighting has been completed, the thumb may be moved over to lie upon cover 54 and to force it down, and during the last few degrees of the cover's rotation, spring 59 will again pass through the axis of rotation and firmly and positively clamp the cover in place.

It will be noted that in this form of the invention the amount of force necessary to cause cover 54 to raise, while not large, is sufficient to minimize accidental operation of the device. The increased travel of piston 56 required to raise the cover aids in this result. Also, it will be noted that the construction of the second form described is substantially simpler, in that hook 20 and associated parts have been eliminated, and the piston simplified.

In either of the above described forms of my invention, it is possible to form the jet of air only, rather than of fuel vapor. This can be accomplished by connecting the end of the pump directly to the jet tube 14. While such a modification would conserve fuel, it gives a somewhat less abundant jet flame.

Having described my invention, I wish to emphasize that many modifications may be made therein without departing from the spirit of my invention, and that I do not desire to be restricted to the details disclosed except as may be required by the spirit of the appended claims.

I claim:

1. A jet flame pipe lighter comprising a housing having a top surface, a fuel chamber in said housing, a wick communicating with said chamber and projecting above said top surface, pyrophoric igniting mechanism mounted on said housing and adapted to be operated to ignite said wick, a jet tube mounted on said housing and in communication with said chamber and having an exit orifice directed across the top of said wick, whereby vapor issuing from said orifice under pressure is directed across the wick flame to deflect the same substantially laterally into a jet-like flame, pump means in said housing connected to produce a positive pressure in said jet tube, and a manually operable member mounted on said housing and connected with both said igniting mechanism and said pump means for conjoint operation by said manually operable member.

2. A jet flame lighter comprising means for igniting fuel to produce a flame, jet means adapted to blow said flame into an elongated lateral jet, pump means adapted to feed said jet means, and a manually operable member connected to initiate operation of said igniting means and directly connected to said pump means, whereby an

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initial operation of said member will initiate operation of said igniting means and successive operations of said member will positively operate said pump means to deflect the resulting flame into an elongated jet.

3. A jet flame lighter comprising a housing, a fuel chamber in said housing, wick means mounted atop said housing and in communication with said chamber, a jet tube located adjacent said wick means and provided with an orifice for the passage of vapor to draw a flame on said wick means into an elongated jet, pump means connected to said jet tube, wick igniting mechanism mounted on said housing, and a manually operable member connected with said igniting mechanism and directly coupled to said pump means, whereby an initial movement of said member initiates operation of said igniting mechanism to ignite said wick means, and successive operations of said member operate said pump means to deflect the flame of the ignited wick into an elongated jet.

4. A jet flame lighter comprising a wick, means for igniting said wick to produce a flame, a jet tube adjacent said wick and having a vapor orifice directed across said wick to blow said flame into an elongated jet, a pump connected to said jet tube to produce pressure therein, and a manually operable member for initiating operation of said igniting means, said member being directly connected with said pump whereby each operation of said member drives said pump to produce a positive pressure in said jet tube.

5. A jet flame lighter comprising a housing, a fuel chamber in said housing, a wick communicating with said chamber, mechanism for igniting said wick, a jet tube arranged adjacent said wick and provided with a vapor orifice arranged to discharge vapor laterally across said wick to elongate the flame thereof, said jet tube being in communication with said fuel chamber, a pump in communication with said chamber and adapted to build up pressure therein and thereby to force vapor through said jet tube, a manually operable driving member connected with said pump, and a one-way connection between said member and said igniting mechanism.

6. In a jet type lighter, a fuel chamber, a wick in communication with said chamber, igniting means for said wick, a jet tube in communication with said chamber and having a vapor orifice directed across and above said wick, means for producing a positive pressure in said chamber to feed vapor to said jet tube whereby to elongate the flame of said wick, and a single manually operable member connected to said igniting means and to said means for producing pressure.

7. In a lighter of the type comprising a body portion, wick means and igniting mechanism mounted on said portion, a movable cover for said wick means and said igniting mechanism, a jet tube adjacent said wick means provided with a vapor orifice directed across said wick means, and pressure-producing means in communication with said jet tube for forcing vapor there-through, the improvement which comprises a single manually operable member mounted on said housing adjacent said cover and connected with said igniting mechanism and with said pressure-producing means, whereby movement of said member initiates movement of said cover to wick-exposing position and ignites said wick, and repeated movements thereof operate said pressure-producing means to cause a lateral elonga-

tion of the flame of said wick means by the stream of vapor issuing from said jet tube.

8. In a jet flame lighter, a burner, an igniter, pressure means to apply a vapor blast across said burner to produce a jet flame, a manually depressible member connected to operate said igniter upon a first depression thereof, and a connection between said member and said pressure means for positively operating the latter upon succeeding depressions of said manually depressible member.

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