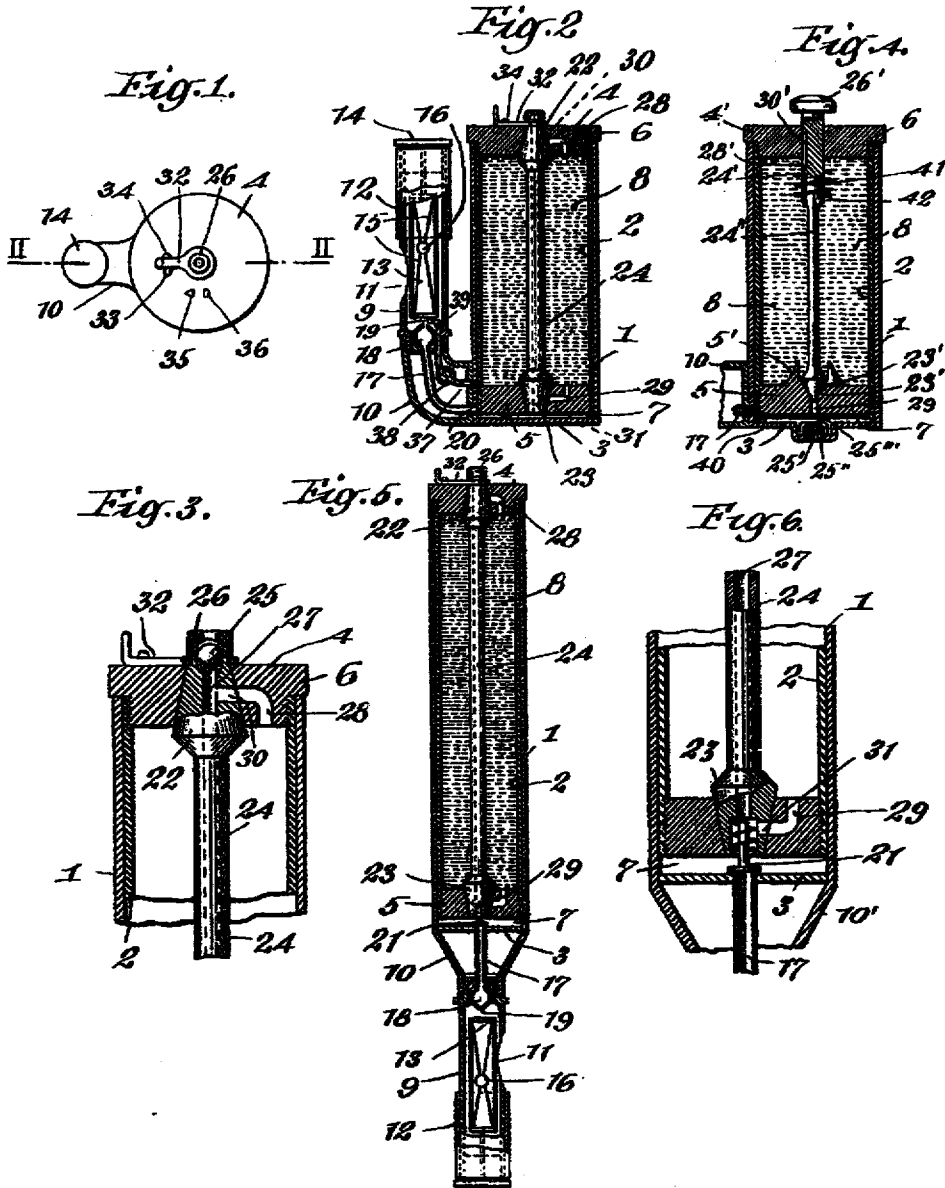


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 AUTOMATIC LIGHTER.
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AUTOMATIC LIGHTER.

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To all whom it may concern:

Be it known that I, SUMTER B. BATTEY, a citizen of the United States, and a resident of the borough of Manhattan, city of New York, county and State of New York, have invented certain new and useful Improvements in Automatic Lighters, as set forth in the following specification.

This invention relates to lighters and more particularly to self-contained, portable, self-igniting pocket lighters for lighting cigars, cigarettes, and for general lighting purposes.

Objects of the invention are to provide for the storage of a maximum quantity of combustible medium in a minimum space; to provide for the storage of a vaporizable, combustible liquid, which may be alcohol, any suitable hydro-carbon, or any other suitable liquid; to provide for the discharge of measurable quantities of the said liquid at the will of the operator; to provide for the positive delivery of said measurable quantities of liquid to a burner; to provide for the positive delivery of air to the said burner which may include the delivery of air under regulated pressure; to provide for the spraying of the vaporizable liquid into the burner; to combine with the burner a catalytic agent for the purpose of self-ignition; to provide for the proper control of the measuring of liquid charges; and in general to improve the reliability and construction of a device of the class described.

The above and further objects of the invention will be apparent from the following specification and claims which should be read in connection with the accompanying drawings, which form part of this application, in which like characters designate corresponding parts, and in which,—

Figure 1 is a plan view of one form of the device; Fig. 2 is a vertical section through line II—II of Fig. 1; Fig. 3 is an enlarged fragmentary vertical section corresponding to Fig. 2 and showing details; Fig. 4 is a vertical section showing a modification of portions of the device and with other portions broken away; Fig. 5 is a vertical section showing a second modification of the device embodying a tandem arrangement of burner and storage chamber; and Fig. 6 is an enlarged detail section, with parts broken away, of the device shown in Fig. 5.

Referring now more in detail to the drawings,—1 indicates an outside shell which is

shown uniform in cross section and cylindrical although it is to be understood that its cross section may be anything desired. An inside shell 2 is fitted to telescope within the outside shell 1. The outside shell 1 has a bottom closure 3 and the inside shell has top and bottom closures 4 and 5, which are threaded into the shell 2 and are adjustable in position. The top closure 4 is shown provided with a flange 6 to rest against the rim of the outside shell 1 and determine the normal size of the measuring chamber 7 within the outside shell 1 and limited by the closures 3 and 5. This chamber 7, as indicated by the drawings, is a predetermined portion within the cavity of the outside shell 1 and may be enlarged by withdrawing the interior shell 2, which together with its end closures, forms a storage chamber 8 for the vaporizable combustible liquid indicated. A burner 9 is suitably mounted exteriorly to the shells 1 and 2 and is shown secured to the shell 1 by an extension 10. This burner provides a burner opening 11 which may be closed by the sliding sleeve 12. A frame 13 is suitably supported or suspended within the burner 9 and is shown suspended from the top closure 14. This frame 13 holds suspended by means of platinum filaments 15, a catalytic agent shown in the form of a pellet 16 of sponge platinum.

An attenuated duct 17 leads from the interior of the shell 1 to the burner. At the base of the burner this duct is shown enlarged to form a retention chamber 18 which opens into the burner through a small orifice 19.

When the shells 1 and 2 are completely telescoped the lower rim of shell 2 closes the inlet opening 20 of the duct 17 in the form of the device shown in Figs. 2 and 4 while a spring pressed mushroom valve 21 accomplishes the same purpose in the modification shown in Figs. 5 and 6.

Suitable valve means is provided for freeing liquid from the chamber 8 into the measuring chamber 7. In Figs. 1, 2, 3, 5 and 6 conical valve members 22 and 23 are fitted into conical holes in the end closures 4 and 5 respectively. These conical valve members are connected by a tubular stem 24 which, together with the members 22 and 23 provides a duct 27 from the chamber 7 to the outer air. A check valve 25 may be provided for this duct to permit the downward passage of air and to check its exit; or this

valve may be omitted and reliance may be had upon the operator's finger resting over the end 26 to close the duct 27 through the tube 24.

Ports 28 and 29 leading from the chamber 8 through the closures 4 and 5 respectively to the conical valve members 22 and 23 and as illustrated. Registerable ports 30 and 31 are formed in the conical valve members 22 and 23 respectively, each leading to the duct 27. A turning handle 32 is suitably secured to the valve member 22 whereby the two valve members 22 and 23 may be rotated so as either to cause the ports 30 and 31 to register with the ports 28 and 29 or to close the ports 28 and 29 according to whether the handle 32 is in the position shown in Fig. 1 and held by catch 33 against stop 34 or is in position to be held by catch 35 against stop 36. There is also shown in Fig. 2 a second duct 37 leading from the interior of the shell and provided with a controlling valve 38 and terminating in a constricted nozzle 39 aimed across the orifice 19. It should be noted that this duct enters the shell 1 considerably above the locality at which the duct 17 enters for a purpose which will be apparent later. This duct 37 may be termed the atomizing duct and is designed to deliver air free from liquid.

In the modified construction shown in Fig. 4 the telescoping shells and their end closures may be the same as heretofore described. An intake check valve 25 is, however, located on the end closure 3 and comprises a valve proper 25' in the form of a disk of suitable material seating upon the intumed flange 25'' and held in place by the spider 25'''. A packing washer 40 is also shown suitably secured to the inside shell to cooperate with the interior of the outside shell and to permit a loose fit between shells 1 and 2. An opening 30' is formed centrally in the closure 4 through which extends a cylindrical stem 24' provided with a manipulating knob 26' and having a lateral cut out portion 28' to act as a port. To economize space the stem 24' may be reduced as shown at 24'' and it terminates at its lower end in a conical plug valve 23' which may be guided by uprights 5' formed on the closure 5 to insure the seating of this plug valve in the conical seat 23'' formed about the duct 29' leading through the closure 5. A spiral spring 41 pressing against the cross pin 42 normally tends to seat the plug valve 23'. In connection with this modification it is to be understood that the burner parts and ducts may be the same as those previously described, although not of necessity.

In connection with the modification shown in Figs. 5 and 6 it is to be understood that the parts characterized by numeral of the same character are specifically the same as

those shown in Figs. 2 and 3. The principal modification shown in these Figs. 5 and 6 is the tandem alined arrangement of the burner 10 and the shells 1 and 2. The extension 10' is shown as a continuation of the shell 1 although this is not necessarily the only form, as the purpose of the extension 10' is to support the burner. The duct 17 is normally closed by valve 21 as previously described.

Operation: The device illustrated in Fig. 2 is shown with its parts in position to measure out a charge of the combustible liquid. The chamber 8 is in communication with the outer air through the ports 28, 30 and duct 27. This chamber is also in communication with the measuring chamber 7 through the ports 29, 31 and duct 27. The ducts 17 and 37 are cut off by the inside shell 2. Liquid will flow out of the chamber 8 so as completely to fill the chamber 7, air taking the place of the liquid that has flowed out of chamber 8. This operation is speedy, it being practically necessary only to manipulate the handle 32 into the position illustrated and then move it back against stop 36 which completely closes the chamber 8 both from the atmosphere and from the chamber 7. The flange 6 of the top closure 4 is then grasped by the fingers and the inside shell construction lifted upwardly when air under atmospheric pressure rushes through the duct 27 past the check valve 25 to fill the chamber 7 which has now been expanded to many times its original capacity and which contains a measured charge of the combustible liquid. The next operation is to force down the inside shell construction which acts as a piston and by properly tilting the device causes the measured charge of combustible liquid to be expelled through the duct 17 to the burner 9. This liquid first flows into the retention chamber 18 which may be of a capacity slightly greater than enough to contain the measured charge of liquid. After the liquid has been forced into the retention chamber from the duct 17, the liquid in small particles is forcibly delivered into the burner 9 with mingled air. The frame 13 is so arranged as to prevent liquid being projected directly against the catalytic agent 16. The vapor from the liquid is blown upwardly about the catalytic agent 16 and is ignited to burn with a blast flame projected through the opening 11.

As will be seen from the drawings an additional duct 37 has been illustrated. This duct may be omitted or may be put out of commission by a valve 38 when its function is not desired. It is especially desirable in cold weather. It leaves the interior of shell 1 considerably above the level of the measured quantity of combustible liquid and delivers comparatively pure air to the nozzle

39 which directs a blast of air transversely to the orifice 19 and serves to aid in finely dividing or atomizing the combustible vaporizable liquid as it is delivered to the burner and facilitates vaporization and consequently quick ignition by the catalytic agent 16.

Although the operation has been described above as it occurs when the retention chamber 18 is provided, it is to be understood that this retention chamber is by no means a necessary feature of the device. For some purposes all that is necessary is controllable means for delivering a vaporizable combustible liquid to the interior of the burner casing, the interior walls of which provide a pocket or pan for holding the liquid introduced. This liquid vaporizes within the burner casing, is ignited by the catalytic agent, also within the casing, and burns through the burner opening 11. It is, of course, to be understood that the charge of the liquid within the burner casing may be more quickly vaporized by injecting air through the duct which first delivered liquid or by shaking the lighter all to agitate the liquid in the casing. A flame is maintained until this entire charge of liquid is consumed. It has been found that this operation is entirely satisfactory without the provision of a wick of any kind.

In connection with the modification shown in Fig. 4 the operation is similar except that the valve mechanism for freeing the initial charge of measured liquid is controlled by a longitudinal movement instead of a rotary movement. The knob 26' is lifted to allow the liquid to run out of the duct 29' into the measuring chamber 7, air entering the chamber 8 through the port 28', which opens when valve 23' is lifted. The valve 23' seats itself and the chamber 8 is automatically closed upon releasing the knob 26'. Upon separating the two shells 1 and 2 air enters chamber 7 through the check valve 25'. Upon pushing the shells together the combustible liquid is expelled in a manner similar to that previously described, check valve 25' automatically closing.

The operation of the modification shown in Figs. 5 and 6 is slightly different from anything previously described, but its parts operate the same as those of Fig. 2. The device is held in an upright position while measuring out the charges of liquid and the valves are manipulated as heretofore described. When the chamber 7 is receiving its charge the mushroom valve 21 closes the duct 17. When it is desired to separate the shells 1 and 2 the device should be held horizontally. On pushing the shells together to expel the charge of liquid and air the device should be inclined more or less gradually toward the vertical position illustrated in the drawings.

It is to be understood that merely illustrative embodiments of the invention have been shown and described and that all modifications as well as all possible combinations of the various parts are contemplated.

What is claimed and what is desired to be secured by United States Letters Patent is:—

1. In a pocket lighter, a wickless burner comprising a casing providing liquid retaining walls; a catalytic agent fixed within said casing; a reservoir for vaporizable combustible liquid; a duct leading from said reservoir to said burner; and manually operable means for causing the delivery of a portion of said combustible liquid still in liquid form into said burner casing.

2. In a self-igniter, means providing a chamber for storing vaporizable combustible liquid; a burner comprising a casing with a catalytic agent fixed therein and both mounted exteriorly to said chamber; means for freeing some of said liquid from said chamber; and provisions comprising a movable wall for positively delivering the freed liquid to said burner.

3. A pocket-lighter comprising, a burner; means providing a storage chamber for vaporizable combustible liquid and a measuring chamber for said liquid; means for opening and closing communication between said chambers; and a duct leading from said measuring chamber to said burner and providing for the conduction of a measured charge of said liquid to said burner.

4. In a lighter, a wickless burner comprising a casing having a burner opening and a liquid retention pocket; a catalytic agent fixed within said casing; and manually operable means for causing the delivery of vaporizable combustible liquid still in liquid form to said pocket.

5. In a lighter, a burner; a retention chamber at the base of said burner; a duct leading to said retention chamber; and means for forcing a vaporizable combustible liquid into said retention chamber and for forcibly delivering air to spray the said liquid into the burner.

6. In a self-igniter, a burner in combination with a catalytic agent; a retention chamber at the base of said burner; a duct leading to said retention chamber; and means for forcing a vaporizable combustible liquid into said retention chamber and for forcibly delivering air to spray the said liquid into the burner.

7. In a lighter, an outside shell with a closure at one end; an interior shell with a closure at both ends and telescoping within said outside shell and forming a storage chamber for a vaporizable combustible liquid; the closure of the outside shell and one closure of the inside shell forming an enlargable liquid measuring chamber with-

in the outside shell; valve means for opening and closing communication between said chambers; means providing for the intake of air into the enlarging measuring chamber upon the withdrawing of said interior shell; a burner outside of said shells; and a duct leading from the interior of said outside shell to said burner.

8. In a self igniter, a burner casing enclosing a catalytic agent, having a burner opening, and providing a pocket for vaporizable combustible liquid; and controllable means for delivering such liquid still in liquid form to said pocket.

9. In a pocket-lighter, tubular means providing a storage chamber for a vaporizable, combustible medium; a burner in combination with a catalytic agent secured in tandem alinement to said tubular means and exteriorly thereto; a liquid measuring chamber intermediate said storage chamber and burner; and valve controlled ducts connecting said chambers and burner.

10. In a pocket-lighter, tubular means providing a storage chamber for a vaporizable, combustible medium; a burner in combination with a catalytic agent secured in tandem alinement to said tubular means and exteriorly thereto; an intermediate measuring chamber; and valve controlled ducts leading from said measuring chamber to said burner.

11. In a lighter, a burner; a storage chamber for vaporizable, combustible liquid; a liquid duct leading to said burner; an air duct leading to said burner and directed across the opening of said liquid duct; and means for forcing liquid through said liquid duct and air through said air duct.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

S. B. BATTEY.

Witnesses:

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