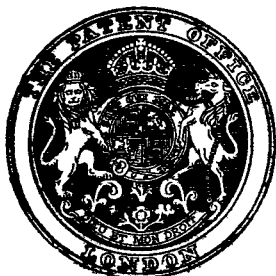


# RESERVE COPY PATENT SPECIFICATION



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## COMPLETE SPECIFICATION.

### Mechanical Lighter, Particularly a Pocket Mechanical Lighter.

We, TAN-ANSTALT, a Body Corporate, organized under the laws of the Principality of Liechtenstein, of Vaduz, Liechtenstein, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a mechanical lighter, particularly a pocket mechanical lighter.

Pocket lighters are known in which, in addition to the normal wick duct, a further wick duct leads from the fuel container to the burning point. This further duct has in cross-section, a widened portion in the form of a cavity situated within the fuel container.

According to the invention there is provided a liquid container, a main tube projecting from said container and adapted to receive a wick, a ring member secured to the outer surface of the container and surrounding the main tube in spaced relation thereto, and a pipe connecting the interior of the liquid container and the space enclosed by the ring member, said pipe having a widened cross-section over a part of its length.

For a better understanding of the nature of the invention and to show how it may be carried into effect the same will now be described with reference to the accompanying drawings, wherein:—

Fig. 1 shows one arrangement in longitudinal section;

Fig. 2 shows another arrangement in longitudinal section;

Fig. 3 shows a further arrangement in longitudinal section.

In the embodiment illustrated in Fig. 1, a short tube 3 is inserted in the cover 2 of the liquid container 1, this tube projecting at one end into the interior 1a of the liquid container and projecting out at the other end above the cover 2. This tube 3 forms a direct tube from the interior space 1a to the burning spot 3a and is in the following

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termed the main tube. In the main tube 3 an absorbent body 4 is arranged, for instance in the form of a wick.

On the cover 2 a fixed ring 5 is arranged concentrically with the tube 3, the space 5a surrounded by this ring can be connected as desired with the outer air or closed off from it, preferably by the sealing means 6 in the closing cover 7 of the lighter. Into the closable space 5a at the end of the main tube 3, a pipe from the liquid space 1a opens at 8. This pipe in the example illustrated consists of branch pipe 9 which opens into a hollow space 11 formed by a container 10. From the hollow space 11 a further part 12 of the pipe opens at the top of the container 10, at 13 into the liquid space 1a. The part 12 of the pipe then extends in the form of a thin pipe almost to the bottom 10b of the container 10. This container 10 is arranged in the interior of the liquid container 1 and forms a widening of the cross-section of the piping 8, 9, 10, 11 and 12. Thereby this piping runs from the interior 1a of the container along the pipe 12 in a direction away from the burning point 3a. The flow through the piping consequently takes place from the opening 13 downwards through the hollow space 11 and up pipe 9 into the closable space 5a around the main tube 3. Of the two ducts connected in parallel (main tube 3 and pipe 8) the main tube 3 has a greater resistance to the flow of fuel than the pipe 8, because of the provision of the absorption member 4. However, in addition to the main tube, the pipe also has at least one part, which in the present example consists of the small pipe 12, which serves to impede the flow, but allows gases to pass through it freely.

In Fig. 3 a further variant of the piping is shown wherein the pipe 12a, passing downward from the opening 13, opens at the bottom into the hollow space 11a of the container 10a, whilst the outlet 9a at the top of the hollow space 11a of the container 10a opens into the space 5a.

In the above examples the mechanical

lighter is one in which the liquid container 1a has no absorbent material.

In the example according to Fig. 2, a liquid container 1 is provided, which is filled 5 with a capillary substance 14, as for instance wadding, staple fibre, or the like. The main tube here consists of a short tube 15 which is fitted on the cover 2 and does not project into the space 1a. The wick 4 is accordingly 10 only guided at the top of the outlet from the interior of the liquid container 1. The piping here opens out of the space 5a, in the form of a small pipe 16 into a suitable widening 17, which is formed by a broad pipe 18 15 provided with holes 19 in the walls. These holes in the walls, as well as the top and bottom openings of the pipe 18 into the space 1a, form the mouth of the piping opening into the liquid container 1a.

20 According to a further important feature of the invention, which is common to the arrangements already described, the end 4a of the wick 4 in the pipe leading from the interior of the liquid container to the burning 25 spot, is surrounded by the actual burner 3b and arranged sunk in it. The actual burner 3b, in the following description termed burner tube, surrounds loosely the part of the main tube 3 projecting from the 30 liquid container 1 and is displaceably arranged along that part. Between the burner tube 3b and the cover 2 of the liquid container 1, a spring 23 is provided, which tends to push the burner tube 3b upwards 35 into the so-called igniting position, where it is held by means of a stop not shown in the drawing. The end 4a of the absorbent body 4 consequently makes contact with the inner 40 wall of the burner tube and is sunk within it in the ignition position of the burner tube. The burner tube 3b is, as can be seen from Figs. 1 and 2, movable up and down between the fixed ring 5 and the main tube 3 or 15 45 tube 3b is, according to the arrangement illustrated, controlled by the closing cover 7 of the mechanical lighter. When the cover 7 is closed, the sealing surface 6 presses the burner tube 3b downwards so that the space 50 5a is tightly closed. When the cover opens, the burner tube 3b moves upwards under the influence of the spring 23 into the ignition position, soaked with fuel. It has also to be mentioned that the upper edge of the mouth 55 of the fixed ring 5 projects a little beyond the edge of the mouth of the main tube, in order to ensure communication of the space 5a with the main tube even when the lighter cover 7 is closed.

60 The novelty, purpose and operation of the aforementioned constructions of the various arrangements are as follows:—

Speaking generally, the purpose of the arrangement according to the invention is 65 that, in consequence of pressure fluctuations

(over pressure or depression) liquid which has begun to move from the liquid container into the hollow space 11 or 17 of the pipe can escape (over pressure), and from there be again led back (depression), whilst the gases 70 can freely escape through the pipe when the closing cover 7 is opened. In this way the introduction of fuel in the main tube remains uninfluenced by pressure fluctuations within the container 1, and is consequently 75 always uniform, thus ensuring a constantly uniform flame. The following separate points are here also referred to: If a pocket mechanical lighter filled with petrol and hermetically sealed by the closing cover is 80 subjected for a given time to warmth, for instance to the warmth radiating from the human body when the lighter is carried in the waistcoat pocket, when the lighter is opened a jet of petrol will be expelled even 85 through very small outlet openings in consequence of the overpressure within the container 1. The reason for this is that, when the cover is opened, the petrol is carried 90 over with the escaping gas as pressure is released. This carrying-over is helped by the fuel rising or foaming up at the moment when the pressure is released. With usual lighters the tube leading the fuel consists mostly of a small tube with an enclosed wick. 95 In such a case the resistance to flow in this tube need be only great enough to prevent the supply to the burning spot being adversely effected. Consequently the wick should be of a quality having only a loose 100 structure in order that the density of the wick and the external and internal friction of the liquid may not become too great. But on the other hand, and here the present invention applies, for pressure equalisation a 105 continually free opening must be present in order that the movement of liquid in the wick tube may neither be accelerated nor retarded by pressure fluctuations. Since, however, the pressure equalisation must take 110 place in a fraction of a second in order to deal with this problem, the hitherto mechanical means for pressure equalisation become inadequate. By reason of the main tube and pipe being connected in parallel, as shown 115 in the example according to Fig. 1, with a liquid container free from absorbent material, and with the aforementioned features, in particular the widening of cross-section in the form of a hollow space 11, 120 this not only ensures a constantly uniform supply of fuel through the main tube 3 to the ignition spot 3a, but in particular also prevents the annoying issuing or squirting-out of the liquid fuel when the mechanical 125 lighter is opened.

Now regarding the arrangement according to Fig. 2 when the liquid container is filled with an absorbent body, the following is to be mentioned here: With this arrangement 130

pressure fluctuations with respect to atmospheric pressure causes undesirable phenomena. If the wadding present in the fuel container 1a is supersaturated and is subjected to an external overpressure, fuel will be forced out through the wick with a strong squirting action, according to the internal pressure, when the cover 7 is opened. In the opposite case of depression, the air flowing in to equalise the pressure will disturb the distribution of the liquid in the absorbent substance; in particular at the inflow region the liquid will be drawn away from the burning position, so that (if the wadding in any case already contains little fuel) a long time may pass until order is again restored and the burning position once more has sufficient fuel supplied to it. In order that these undesirable phenomena may not occur, (particularly the squirting action arising from the hermetic closing of the cover) the pipe is arranged parallel to the wick tube 3, as already described. Here also the pipe leads to a widening in the form of the hollow space 17, which in the aforementioned manner is in contact with the capillary substance surrounding it. This hollow space prevents free liquid being drawn over as pressure is released when the capillary substance (wadding or the like) is supersaturated. In the contrary case of depression, i.e. when air flows in, a rapid pressure equalisation is then ensured in the hollow space 17. In both cases the feeding of the wick remains uninfluenced.

As regards the purpose and the method of working of the burner tube 3b movable up and down in the space 5a, mention of an important feature should be made that the wick end 4a, when the closing cover 7 is opened, for instance when lighting, is not in the region of the flame, since it is arranged sunk with respect to the upper edge of the burner tube 3b where the flame is formed. The burner tube 3b pressed down by the closing cover 7, takes up fuel internally and externally, particularly if it consists of a substance which can store liquid. When the cover is opened and the burner tube 3b moves a corresponding distance upwards, the wick end 4a moves over this inner wall. The burner tube 3b is consequently well supplied with fuel in the ignition position, so that when operating a friction ignition wheel an immediate formation of flame takes place. Because of the surrounding and sinking of the wick end 4a, this takes no part in the forming of the flame, the wick therefore does not become smoked and is also not consumed. Consequently all the drawbacks connected with smoking and burning of the wick are avoided.

Having now particularly described and ascertained the nature of our said invention

and in what manner the same is to be performed, we declare that what we claim is:—

1. In a mechanical lighter, the provision of a liquid container, a main tube projecting from said container and adapted to receive a wick, a ring member secured to the outer surface of the container and surrounding the main tube in spaced relation thereto, and a pipe connecting the interior of the liquid container and the space enclosed by the ring member, said pipe having a widened cross-section over a part of its length.

2. In a mechanical lighter according to Claim 1, the provision of a hollow container in the liquid container, and in communication with the hollow space, a tube leading to the space between the ring member and the main tube.

3. A mechanical lighter according to Claim 1, characterized in that at least one of two parallel ducts (main wick tube and pipe) comprises a part restraining the delivery of liquid.

4. A mechanical lighter according to Claim 1, characterized in that a part of the pipe leads in the direction opposite the direction from the container of the liquid fuel to the burning point.

5. A mechanical lighter according to Claim 2, characterized in that the widening in the cross-section of the pipe is formed by the hollow space in the container communicating, through a liquid restraining part of the pipe, with the liquid container.

6. A mechanical lighter according to Claims 1 and 4, characterized in that that part of the part of the pipe which leads in the direction opposite the direction from the liquid container to the burning point is formed by a narrow pipe passing through the hollow space in the container to the lower part thereof.

7. A mechanical lighter according to Claim 1, characterized in that there is mounted on the end of that part of the main tube which extends out of the fuel container a sleeve serving as a burner tube, the said sleeve being arranged for vertical displacement while the end of the wick is directly surrounded by the sleeve which, when the lighter is closed, is maintained in its lower end position by the closing cover of the lighter and when the said closing cover is opened for the purpose of igniting the lighter, moves into the upper end position in which the wick end is sunk in the sleeve.

8. A mechanical lighter substantially as hereinbefore described with reference to the accompanying drawings.

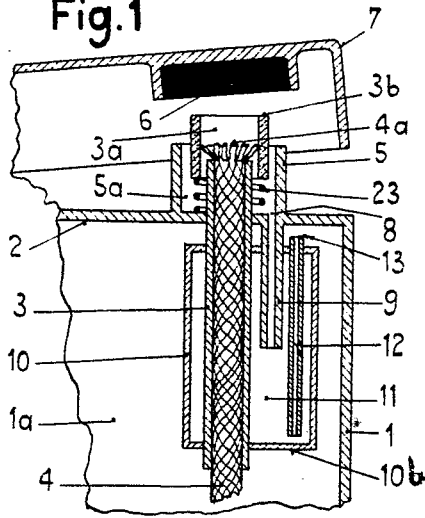
Dated the 6th day of February 1948.

HASELTINE, LAKE & CO.,  
28, Southampton Buildings, London, England, and 19-25, West 44th Street, New York, U.S.A.

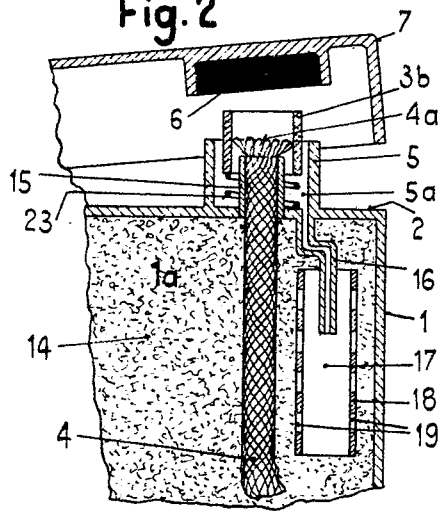
Agents for the Applicants.

*This Drawing is a reproduction of the Original on a reduced scale*

**Fig. 1**



**Fig. 2**



**Fig. 3**

