

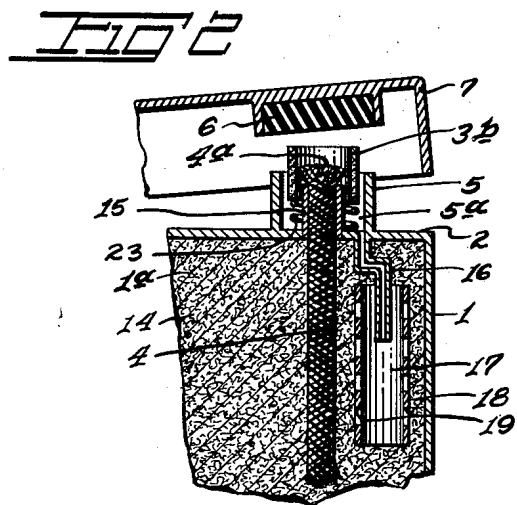
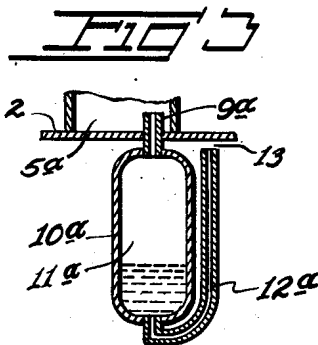
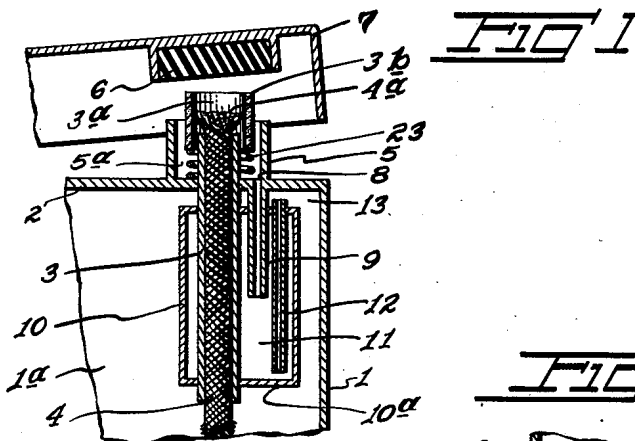
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T. RUETZ

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MECHANICAL LIGHTER

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INVENTOR.

THEODOR RUETZ

BY

Young, Lemay & Thompson
Attys.

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MECHANICAL LIGHTER

Theodor Ruetz, Zurich, Switzerland

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The invention relates to a mechanical lighter, particularly a pocket mechanical lighter, which is essentially distinguished in that, in addition to the direct pipe (main pipe) to the burning spot, a further pipe (secondary pipe) works together with a liquid container, the secondary pipe having a widened cross-section over a part of its length. The secondary pipe may also preferably lead into a space at the end of the main pipe—which can be connected as desired to and shut off from the outside air—whereby further, of the two pipes connected in parallel, the main pipe has a greater resistance to the flow of fuel than the secondary pipe, and also the two pipes have at least one part impeding the flow of liquid.

Further features of the invention can be seen from the claims, the specification and the drawing, where some forms of execution of the mechanical lighter are illustrated diagrammatically by way of example in the form of a pocket lighter.

Fig. 1 shows one form of lighter in longitudinal section,

Fig. 2 shows another form of lighter in longitudinal section, and

Fig. 3 is a vertical section of another form of lighter.

According to the form of the invention 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 pipe from the interior space 1a to the burning spot 3a and is in the following termed a main pipe. In the main pipe 3 an absorbent body 4 is arranged, for instance in the form of a wick.

In the cover 2 a fixed ring 5 is arranged concentric to the tube 3; the space 5a surrounding 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 pipe 3, a secondary pipe 9 is provided from the liquid space 1a opening at 8. This secondary pipe in the example illustrated consists of tube 9 which opens into a hollow space 11 formed by a container 10. From the hollow space 11 a further part or tube 12 of the secondary pipe opens at the top at 13 into the liquid space 1a. The part 12 of the secondary pipe then extends in the form of a thin tube until nearly the bottom 10a 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 secondary pipes 8, 9, 10, 11 and 12. Thereby this secondary piping runs from the interior 1a of the container along the tube 12 in a direction contrary to the direction from the interior space 1a to the burning point 3a. The flow through the secondary pipes consequently takes place from the point 13 downwards and through the hollow space 11 and the tube 9 into the closable space 5a of the main pipe 3. Of the two pipes connected in parallel (main and secondary pipes) the main pipe has a greater resistance to the flow of fuel than the secondary pipe, because of the provision of the absorption member 4. However, in addition to the main pipe, also the secondary pipe has at least one part impeding the flow, which in the present example consists of the small tube 12, which acts to impede the flow, but allows gases to pass therethrough freely.

In Fig. 3 a further variant of the secondary piping is shown where the pipe 12a, passing downwards from the point 13, opens at the bottom into the hollow space 11a of the container 10a, whilst the outlet 9a above the hollow space 11a of the container 10a leads into the space 5a.

In the afore-mentioned example the mechanical lighter is one in which the liquid container 1a has no absorbing material.

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

According to a further important feature of the invention, which is common to the examples of execution already described, the end 4a of the wick 4 in the pipe leading from the interior of the liquid container to the burning spot, is surrounded by the actual burner 3b and arranged depressed therein. The actual burner 3b, in the following termed burner tube, surrounds a part of the main pipe 3 in spaced relation, projects from the liquid container 1 and is displaceably

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arranged. Between the burner tube 3b and the cover 2 of the liquid container 1, a spring 23 is provided, which tends to force the burner tube 3b upwards 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 or wick 4 makes contact with the inner wall of the burner tube and is depressed within the tube in the ignition position thereof. 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 pipe 3 within the space 5a. The burner tube 3b is, according to the example of execution 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 downwards so that the space 5a is tightly closed. When the cover opens, the burner tube 3b moves under the influence of the spring 23 into the ignition position, soaked with fuel. It is also to be mentioned that the upper edge of the mouth of the fixed ring 5 projects a little beyond the edge of the mouth of the main pipe, in order to ensure connection of the space 5a with the main pipe even when the lighter cover 7 is closed.

Idea, purpose and working of the fore-described construction of the various examples of execution are as follows:

Speaking generally, the purpose of the arrangement according to the invention is that, in consequence of pressure fluctuations liquid in the liquid container flows into the hollow space 11 or 17 of the secondary pipe and can escape (over pressure) and from there be again led back (depression), whilst the gases can freely escape when the closing cover 7 is opened. In this way the introduction of fuel in the main pipe remains uninfluenced by pressure fluctuations, and is consequently 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 closed by the closing cover is 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 through very small outlet openings in consequence of the overpressure. The reason for this is that, when the cover is opened, the petrol is carried over with the escaping gas when pressure is released. This carrying-over is favoured by the fuel rising or foaming up in the moment when the pressure is released. With the usual lighters the pipe leading the fuel consists mostly of a small tube with an enclosed wick. In such a case the resistance to flow in this pipe need be only great enough to prevent the supply to the burning spot being adversely affected. Consequently the wick should be of a quality having only a loose structure in order that the density of the liquid may not become too great. But on the other hand, and here the present invention applies, for pressure equalisation a continually free opening must be present in order that the movement of liquid in the wick pipe may neither be accelerated nor retarded by pressure fluctuations. Since pressure equalisation, however, must take place in a fraction of a second, for solving the problem set, the hitherto mechanical means for pressure equalisation fall out of consideration. The means of the pipes connected in parallel, chosen in the example according to Figs. 1 and 3

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with liquid containers free from absorptive material, with their above-mentioned features, in particular the widenings of cross-section in the form of a hollow space 11, not only ensure a constantly uniform supply of fuel through the main pipe 3 to the ignition spot 3a, but also prevent particularly the annoying issuing or squirting-out of the liquid fuel when the mechanical lighter is opened.

Now regarding the form of execution according to Fig. 2 with the liquid container filled with an absorptive body, the following is to be remarked here: Also with this execution pressure fluctuations with respect to atmospheric pressure cause unpleasant 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 in accordance with 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 in 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 has once more sufficient fuel supplied to it. In order that these unpleasant phenomena may not occur—particularly the squirting action in consequence of the hermetic closing of the cover—a secondary or relieving pipe is here arranged parallel to the wick pipe 3, as already described above. Here also the secondary pipe leads to a widening in the form of the hollow space 17, which in the above-described manner stands in connection with the capillary substance surrounding it. This friction prevents free liquid being drawn over when 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 guiding of the wick remains here 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 cover 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 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 the friction wheel ignition and 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 are avoided.

I claim:

1. A mechanical lighter comprising a container to receive a fluid, a main tube projecting from the 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

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relation, an auxiliary container in the first-mentioned container, and a tube in communication with the auxiliary container and the space between the ring member and the main tube.

2. A mechanical lighter comprising a container to receive a fluid, a main tube projecting from the 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, an auxiliary container in the first-mentioned container, a tube in communication with the auxiliary container and the space between the ring member and the main tube, and a burner tube surrounding the main tube in spaced relation and mounted in the space between the main tube and the ring member.

3. A mechanical lighter comprising a container to receive a fluid, a main tube projecting from the 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, an auxiliary container in the first-mentioned container, a tube in communication with the auxiliary container and the space between the ring member and the main tube, a burner tube surrounding the main tube in spaced relation and mounted in the space between the main tube and the ring member, and a spring between one end of the burner tube and the first-mentioned container to urge the burner tube upwardly when a cover of the lighter is opened.

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4. A mechanical lighter according to claim 1, in which the main tube extends into the first-mentioned container.

5. A mechanical lighter according to claim 1, in which the main tube extends into the first-mentioned container and entirely through the auxiliary container.

6. A mechanical lighter according to claim 1, in which a pipe section extends into the auxiliary container and the first-mentioned container.

THEODOR RUETZ.

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