Oct. 25, 1966 O. S. GROP 3,280,598

CIGARETTE LIGHTERS

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Fig. 1

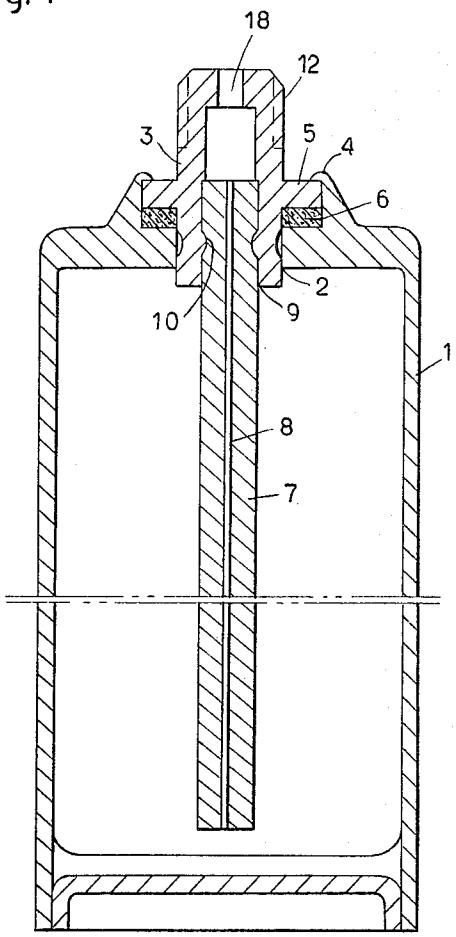

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Fig. 2

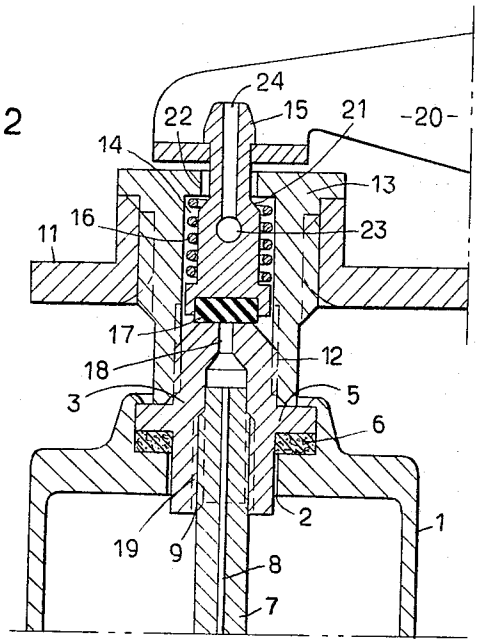

Fig. 3

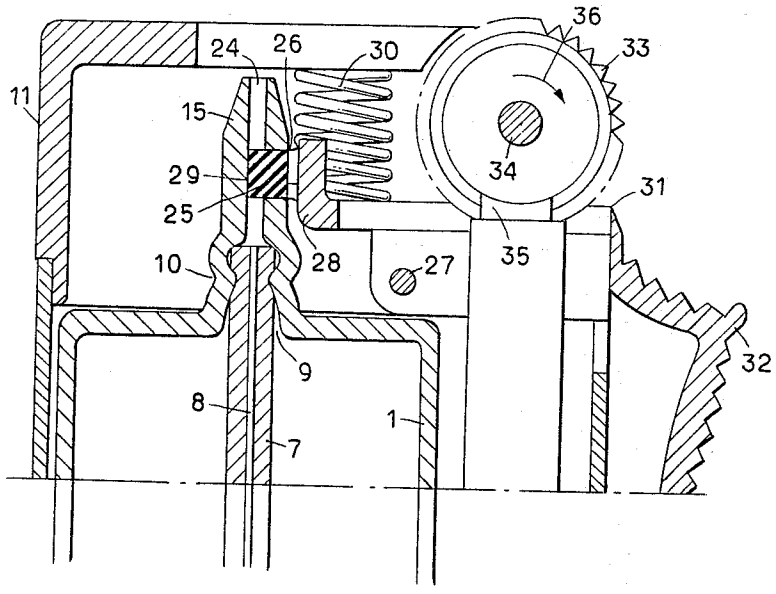

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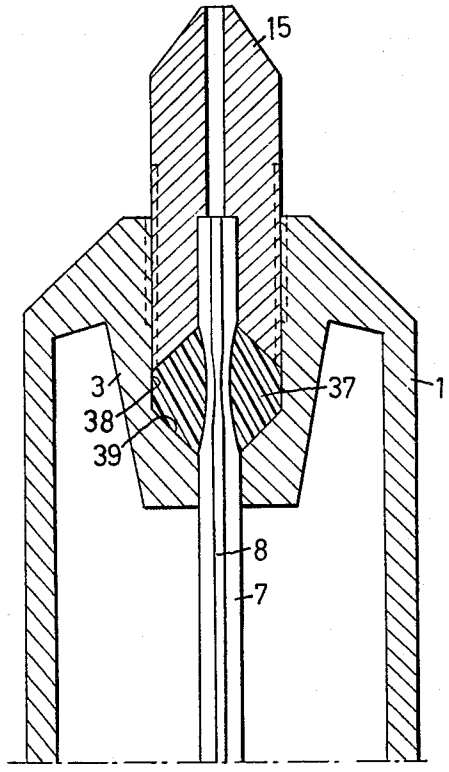
FIG. 4



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United States Patent Office

3,280,598

Patented Oct. 25, 1966

3,280,598

CIGARETTE LIGHTERS

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Filed July 16, 1964, Ser. No. 383,095
6 Claims. (Cl. 67—7.1)

This invention relates to cigarette, or the like, lighters, which are provided with a fuel nozzle, to which nozzle gas-forming liquid is fed out of a fuel container by means of a tube containing a wick with reducing conduction capacity, and a closure device.

Valves for reducing the flow area to a size suitable for obtaining a flame of the desired height, have hitherto been comparatively complicated in construction. The aperture through which the liquid fuel must pass, in order that a sufficiently high flame is obtained, is so small that it corresponds to a circular aperture with a diameter of 0.03 mm. An alteration in the diameter of the aperture results in a large alteration in aperture area, since the area varies with the square of the diameter. Since it is difficult to make such small apertures to a given diameter, it can easily be seen that this means precision work if, an uncontrollable throttle aperture of the said order of size for the liquid, is used to maintain an equal reduction in flow area for all lighters produced in mass production. It has been proposed in German Patent No. 1,079,-371 to constrict the narrow gas duct by one or more threads introduced in the aperture, but it is obvious that it is extremely difficult to introduce one or more fine threads into what is already an extremely narrow duct. Such introduction of threads is perhaps possible in short ducts, but it would probably be impossible to proceed in this way in the case of long tubes when the fuel has to be led up from the bottom of a fuel container.

Such reducing valves are, as a rule, provided with members by means of which the degree of throttling of the flow area can be regulated and to which valves the fuel can be fed by means of a wick or the like. The addition of such members naturally means an expensive complication in the production of the lighter.

It is an object of the invention to produce a wick which can easily be fitted in the fuel container and which can lead the liquid from the container to the fuel nozzle with the requisite reduction of the flow area. For this purpose the wick is enclosed in a synthetic plastic sleeve and the upper end of the sleeve is inserted in an aperture, pressing together the sleeve and the wick, in a collar provided in the fuel container.

The invention will now be described by way of example with reference to the accompanying drawing, wherein:

FIGURE 1 represents a longitudinal section of a fuel container for use for a lighter having a wick arranged in accordance with the invention,

FIGURE 2 is a similar view of such a container with a second embodiment of the wick altering means and with the container inserted in a lighter which is partly shown,

FIGURE 3 is a similar view of part of a further fuel container for use in another embodiment, and

FIGURE 4 is a similar view of part of a further embodiment of such a container.

The fuel container **1** shown in FIGURE 1 forms a container for single use. It has at the top an aperture **2**, in which a collar **3** is inserted and fixed so that the upper rim **4** of the aperture is turned over a flange **5**. Under the flange is inserted a packing **6** which seals the opening between the collar and the container.

A wick **8**, enclosed in a synthetic plastic sleeve **7**, is inserted in the aperture **9** of the collar, extends to the bottom of the container, and is held fast, for example, by an inwardly bulging corrugation at **10** in the aperture **9**, in such a way that the aperture is given a smaller cross-

sectional area than the sleeve, and by which corrugation the sleeve and wick are pressed together. The wick now leads the fuel from the bottom of the container to the collar and there acts as a valve reducing the flow area, whose reducing capacity depends among other things on the size of the corrugation at **10**.

This fuel container can, as shown in FIGURE 2, be made interchangeable in the casing **11** of the lighter, in such a way that the collar **3** provided with the male thread **12** is screwed from the bottom into a nipple **13** screwed into the casing. The aperture **14** through the nipple acts as a guide for a fuel nozzle **15** movable in the aperture, which is normally held pressed against the upper end of the collar **3** by a compression spring **16**, and by means of a joint **17** inserted on the underside of the fuel nozzle, closes the mouth of the duct **18** against the collar and prevents gas escaping.

In this case the wick of the sleeve **7** is held fast in the aperture **9** by the sleeve being screwed in the aperture **9** provided with screw thread **19**.

When the lighter is ignited gas reaches the fuel nozzle **15** by this being somewhat raised in known manner by a partly shown rockable arm **20** operating against the action of a compression spring **16**. In this operation the mouth of the aperture of the collar **18** is freed, so that gas can reach the aperture **14** in the nipple **13** acted on by the compression spring **16**. A continuous flow of gas upwards outside the fuel nozzle **15** is prevented by an outwardly conical fitting **21** on the fuel nozzle, which fitting is pressed sealingly against the lower edge of a narrower part **22** of the aperture **14**. The gas now flows through a transverse aperture **23** in the fuel nozzle to the aperture **24** of the fuel nozzle and out of the mouth of aperture **24**, while it is ignited by means of the friction member shown in FIGURE 2.

In the form of embodiment represented in FIGURE 3 the fuel nozzle **15** is made in one piece with the fuel container **1** and takes the form of a collar drawn out from the end piece of the container. In a further part of the aperture **9** through the collar the end of the sleeve **7**, containing the wick **8**, is held fast by means of an inwardly bulging corrugation **10**, which in this embodiment is placed outside the container. The duct **24** going through the fuel nozzle, which represents a narrower extension of the aperture **9** is normally closed by a rubber stopper **25**, which is inserted in an aperture **26** in the fuel nozzle leading from the side into the duct **24**. An operating lever in the form of a two-armed lever swivellable around a transverse spindle **27** in the casing, normally presses, by the bent-over end **29** of one arm **28**, against the rubber stopper under the action of a compression spring **30** applied between the arm and the casing so that the rubber stopper is pressed with a certain amount of deformation partly into the duct **24** and closes this and, thus, also the gas feed. The other arm **31** of the lever is formed as a finger grip **32** guided downwardly along the casing. Above the said second arm **31** an ignition roller **33** of the usual type is supported rotatably on a spindle **34** in the casing. An ignition flint **35** is applied against the ignition roller from below which flint is pressed by a spring (not shown) against the ignition roller.

This lighter is ignited by the casing being held by one hand and the thumb, for example, laid along the ignition roller **33** in the direction of the arrow **36**. Here the thumb can slide from the ignition roller onto the arm **31**, by which the actuating member swivels clockwise say against the action of the compression spring **30**, so that the pressure of the arm **28** is applied against the rubber stopper **25**. This means that the rubber stopper partly assumes its non-deformed shape and releases a part of the cross-sectional area of the duct **24** so that gas can

flow through the duct and sparks can be produced by friction of the ignition roller **33** against the flint **35**.

As soon as the arm **31** is let go the compression spring **30** swings the actuating member **28** back in the counter-clockwise direction, so that the rubber stopper is again partly pressed into the duct **24** and closes this and also therefore the gas flow.

Another embodiment of the lighter in accordance with the invention is represented in FIG. 4. In the collar **3** of the fuel container **1** the synthetic plastic sleeve **7**, provided with the wick **8**, is fixed in such a way that its upper end is enclosed by a plastic ring **37** which bears against conical cam surface **39**, and which can be compressed or relieved from load by rotating the fuel nozzle **15**. In this way it is possible to reduce the cross-sectional area of the sleeve and hence also of the wick, by which a control of the gas feed to the nozzle and, hence, the height of the flame can be obtained in a simple manner.

The gas feed regulation arrangement is made easier if, as shown in FIGURE 4, the surface **38** of the fuel nozzle **15** abutting the ring **37**, and the opposing cam surface **39** of the base of the aperture are made conical in such a way that the ring embraces a greater axial length of the sleeve **7** than that of the aperture. Thus by using a given ring the wick **8** is compressed along a greater part of its length than if the surfaces **38** and **39** were normal to the axis of the aperture.

I claim:

1. In cigarette lighters, walls forming a container for gas-forming liquid, a collar in the container in connection with a fuel nozzle, a synthetic plastic sleeve within said container and containing a wick with reducing conductive capacity, the upper end of said sleeve extending into an aperture in said collar, said aperture in said collar compressing said sleeve and said wick, and a closure device for the closure of the fuel current to the nozzle said sleeve surrounding the wick along the whole length of the wick and reaching near the bottom of the container.

2. A cigarette lighter as claimed in claim **1**, and in which the collar is fixedly applied in the container and an inwardly extending corrugation is provided in the part of the collar, which is located in the fuel container for gripping and compressing said sleeve.

3. A cigarette lighter according to claim **1**, and in which said fuel nozzle is formed by said collar, said collar being integral with one of said walls of the container, said collar having an inwardly extending corrugation for gripping the sleeve.

4. A cigarette lighter according to claim **1**, said aperture in said collar being threaded and said sleeve being screwed into said aperture by its upper end.

5. A cigarette lighter according to claim **1**, said aperture in said collar being an upper wider threaded part, an elastic ring inserted in said wider part surrounding said inserted sleeve, said nozzle being threaded and screwed into said aperture and thereby compressing said ring, so that the ring will compress said sleeve, at least one of the surfaces of the nozzle and of the bottom of the aperture abutting the ring being made conical in such a way, that the ring embraces over a greater axial length of the sleeve than that of the aperture.

6. A cigarette lighter according to claim **1**, and in which said collar compresses said sleeve and wick by means of an inwardly extending corrugation formed in said collar gripping said sleeve.

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