United States Patent

[11] 3,583,846

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[21] Appl. No. **866,304**
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[45] Patented **June 8, 1971**

[73] Assignee **Ronson Corporation**
Woodbridge, N.J.

[54] **ATTACHMENT FOR A GAS REFILL**
7 Claims, 13 Drawing Figs.

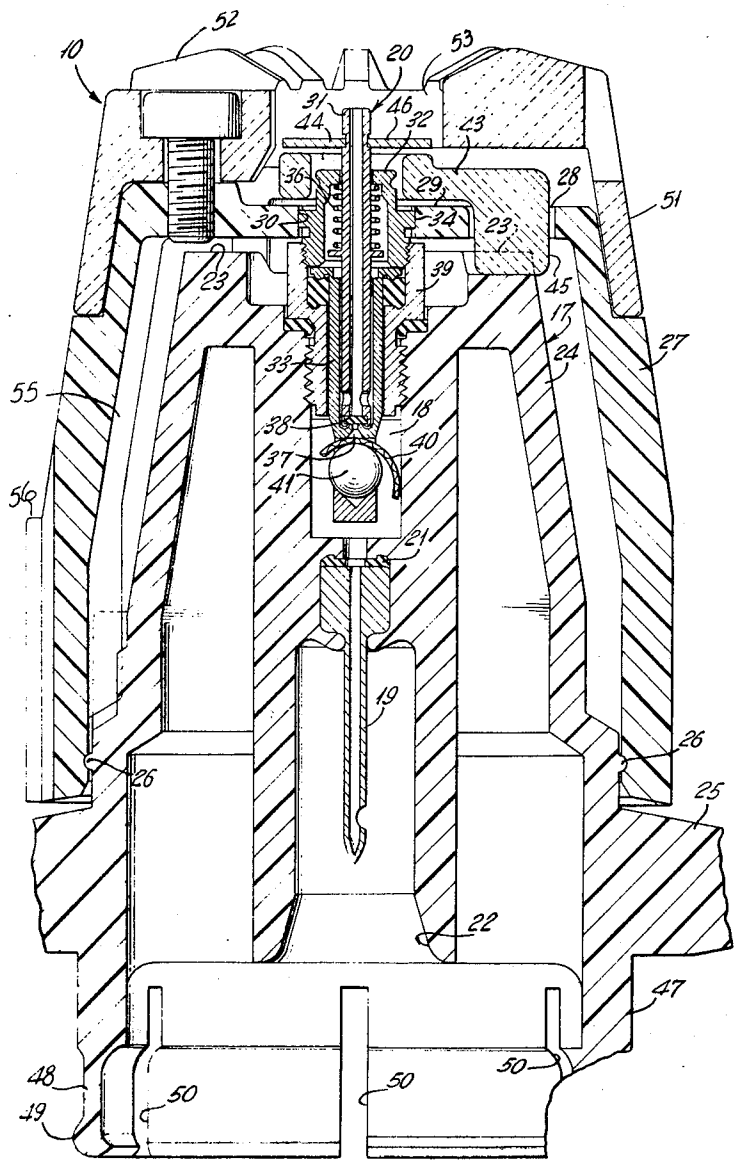
[52] **U.S. Cl.** **431/142,**
222/44, 222/3, 222/402.13, 431/344
[51] **Int. Cl.** **F23q 2/00**
[50] **Field of Search** 222/30, 23,
44, 46, 3, 402.13, 402.14; 431/344, 130, 150, 142,
143; 222/325

[56] **References Cited**
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Primary Examiner—Harvey C. Hornsby
Assistant Examiner—H. S. Lane
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ABSTRACT: An attachment for a gas refill whereby the refill can be converted into a flame producing mechanism. The attachment can shut off and vary the size of the flame by controlling the flow of gas which escapes through a burner valve by actuating a valve lifting cam.



PATENTED JUN 8 1971

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SHEET 1 OF 4

Fig. 1.

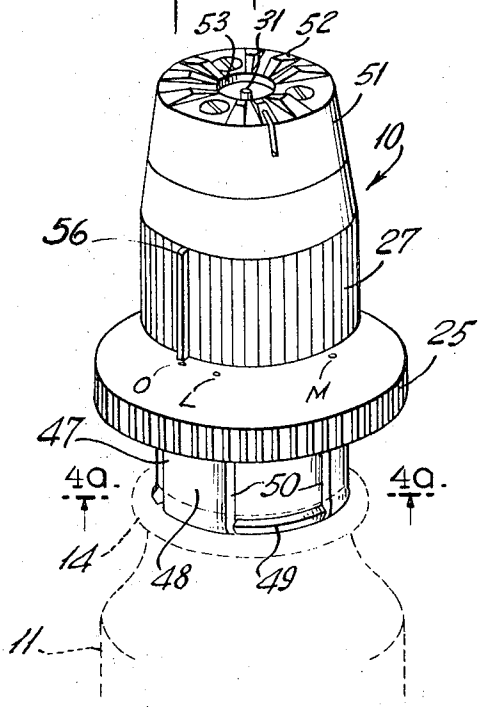


Fig. 2.

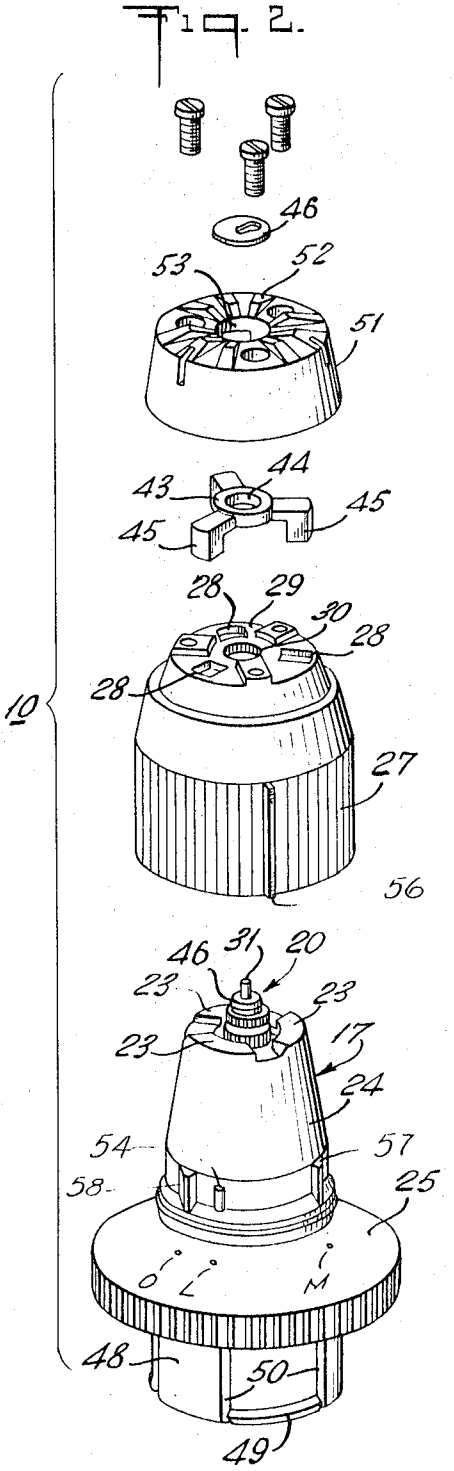


Fig. 3.

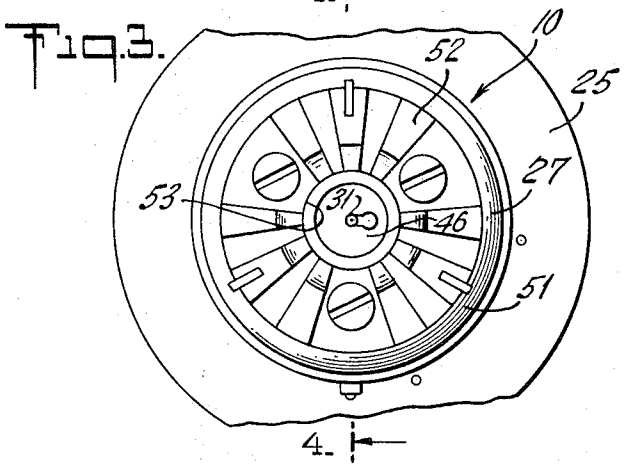
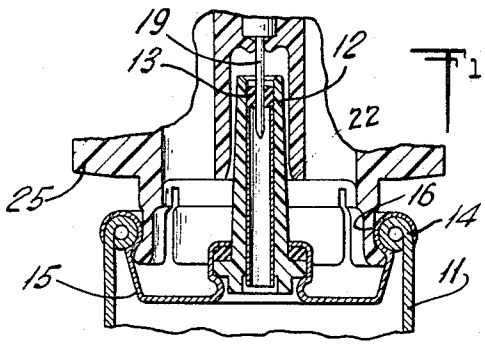
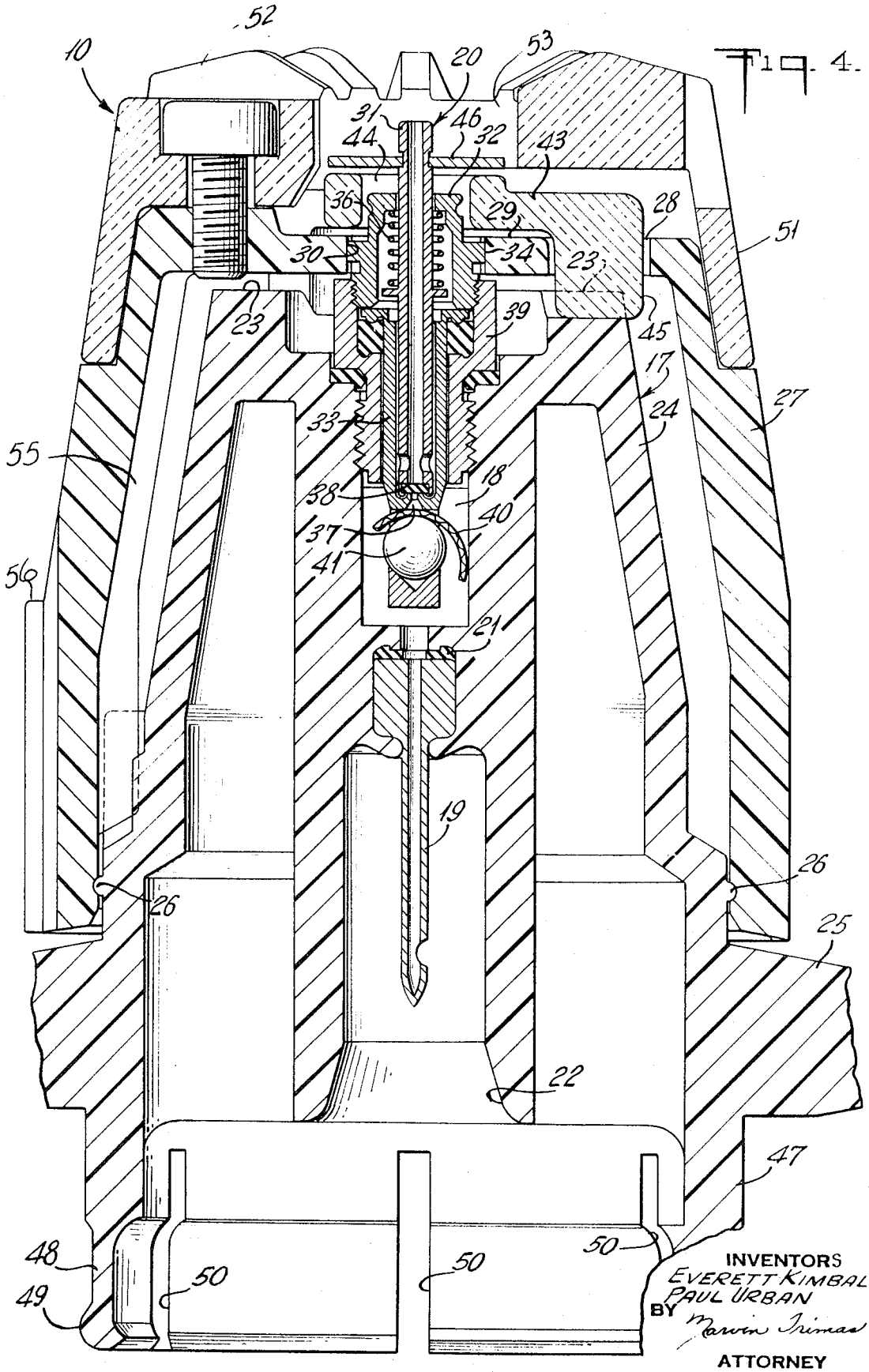


Fig. 4a



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Fig. 4.



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Fig. 5.

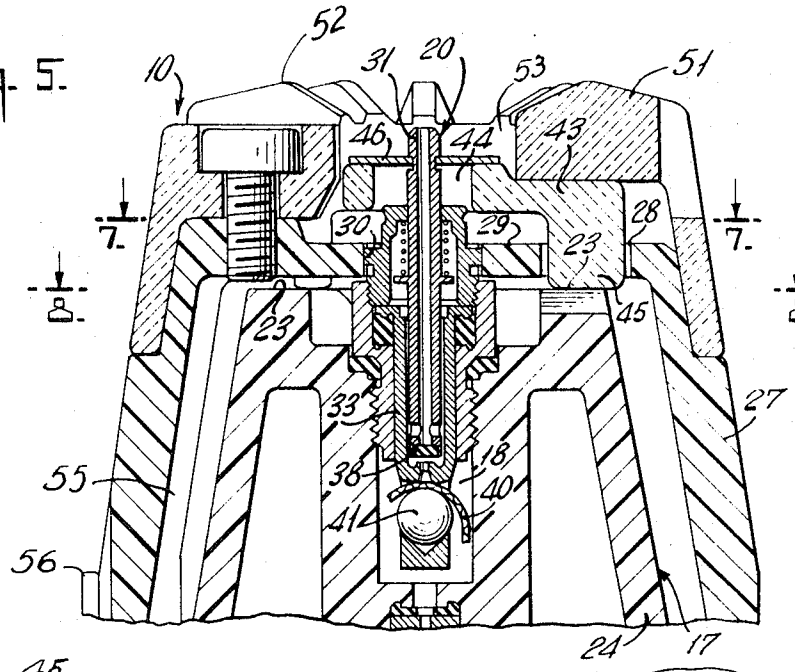


Fig. 6.

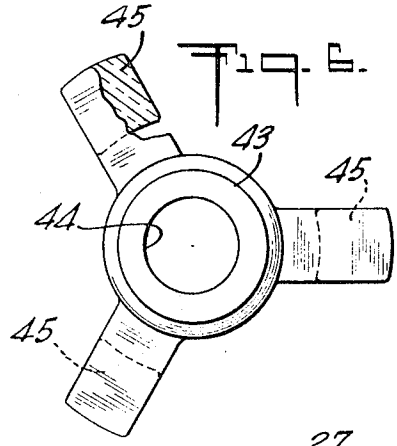


Fig. 7.

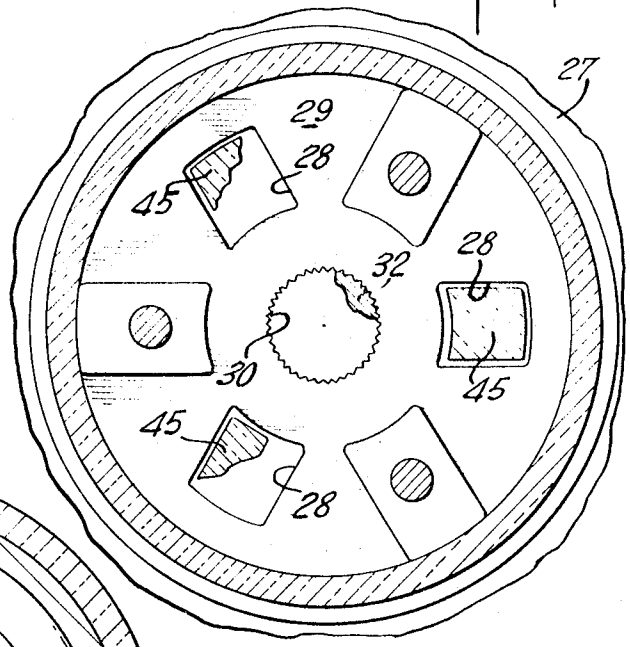
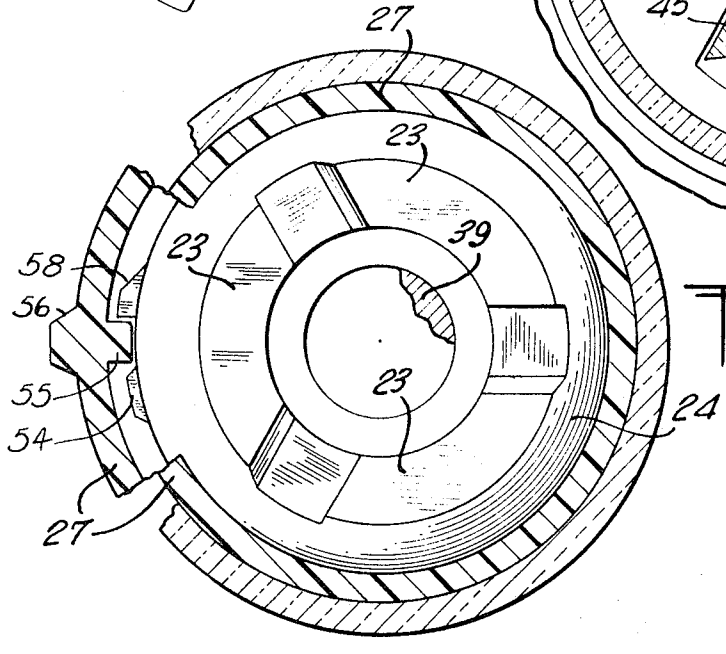


Fig. 8.



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Fig. 9.

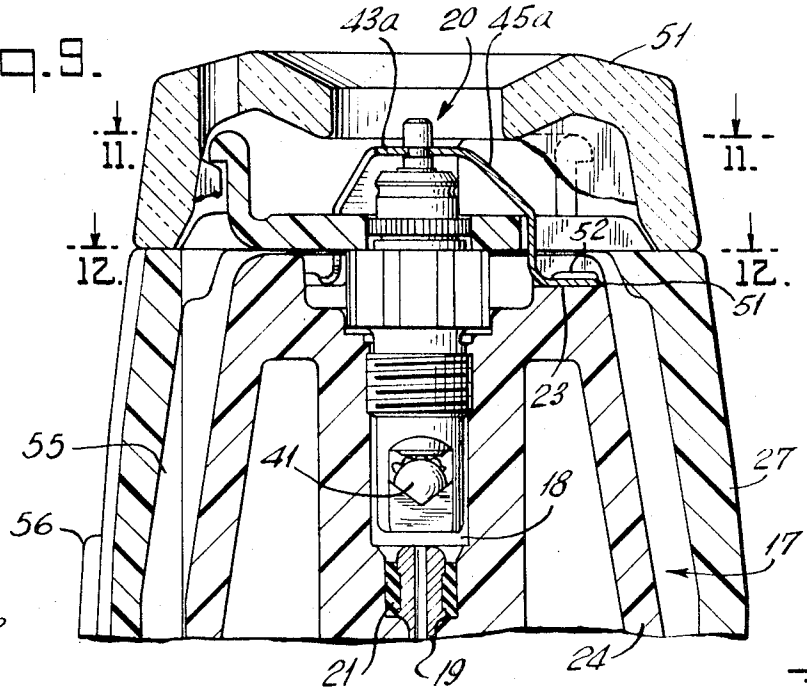


Fig. 10.

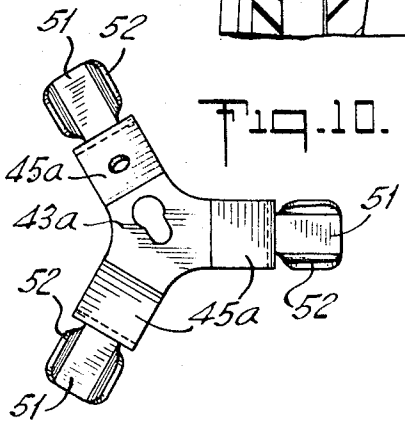
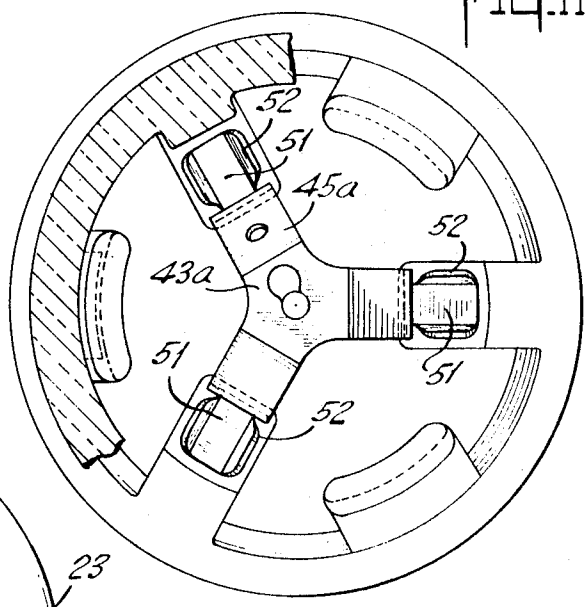


Fig. 11.



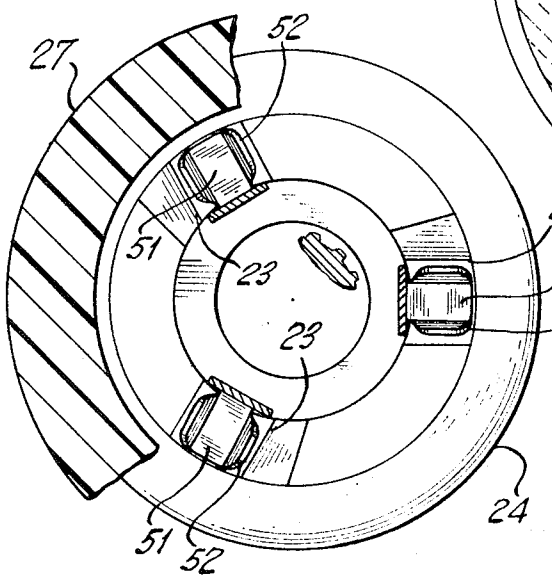


Fig. 12.

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ATTACHMENT FOR A GAS REFILL

BACKGROUND OF THE INVENTION

There are many devices on the market which can be refueled with a liquefied fuel gas such as butane. These devices have appeared in the form of gas cigarette lighters and portable stoves, for example, which have a fuel reservoir therein. The fuel reservoir, when empty, can be replenished by refueling it through an inlet valve in the reservoir. A gas refill supplies the gas through the inlet valve into the reservoir of the lighter.

It has been found desirable and economical to use the refill itself as a fuel reservoir thereby eliminating the need for a self-contained reservoir and an inlet valve.

SUMMARY OF THE INVENTION

An attachment, which has been made to releasably fit upon a refill container, has a needle therein for piercing a rubber diaphragm on a refill. When the diaphragm is pierced, gas can flow through the hollow needle. It is not necessary to use a needle as a means to actuate a refill. If a refill is used having a spring-biased valve thereon, then a plate which fits over the spring-biased valve having an opening therein can be used to actuate the refill and initiate a flow of gas. The gas can then flow into a burner valve from whence it exits and is ignited. The burner valve consists of a housing having a stem therein which is spring-biased to a closed position.

Upon rotation of an adjusting wheel, the stem of the burner valve is lifted to permit gas to flow to the atmosphere and be ignited. By turning the adjusting wheel which is in splined engagement with the burner valve, the amount of gas released from the burner valve can be adjusted and thus the size of the flame produced can be adjusted to suit one's needs.

Accordingly, it is an object of the present invention to provide an attachment for a refill to convert the refill into a controlled flame emitting device.

It is a further object of the invention to provide a flame emitting device which is simple to fabricate and inexpensive to manufacture.

It is another object of this invention to provide a mechanism for controlling the flow of gas through a burner valve.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, reference may be had to the accompanying drawings in which:

FIG. **1** is a perspective view showing the attachment for a refill which is shown in dashed lines;

FIG. **2** is an exploded view of the attachment;

FIG. **3** is a top view of the attachment;

FIG. **4** is a view taken along line **4–4** in FIG. **3**;

FIG. **4***a* is a cross section showing a flame adjusting attachment secured to a refill;

FIG. **5** is a cross section of the upper portion of the attachment;

FIG. **6** is a top view partly in section of a cam follower;

FIG. **7** is a top view of the shroud taken along line **7–7** in FIG. **5**;

FIG. **8** is a view taken along line **8–8** in FIG. **5**;

FIG. **9** is a cross section showing another embodiment of the invention;

FIG. **10** is a top view of a modified cam follower;

FIG. **11** is a top view taken along line **11–11** in FIG. **9**;

FIG. **12** is a top view taken along line **12–12** in FIG. **9**.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. **1** there is shown a flame adjusting attachment **10** releasably attached to a refill **11**. The refill can be of the type

which is well known and is depicted in U.S. Pat. No. 3,224,626 filed Dec. 27, 1963 and issued on Dec. 21, 1965 to Conrad Zellweger. The refill **11** has a hollow neck **12** thereon terminating a pierceable, self-sealing diaphragm **13**. A fuel, preferably of the liquefied petroleum type, such as butane, is stored under pressure in the refill **11**. The refill **11** has a circular rim **14** on the upper portion thereof and a recessed portion **15** therein. The rim **14** and the recessed portion **15** thus define a shoulder **16** therebetween.

The attachment **10** comprises a valve housing **17** which can be a molded plastic part or can be formed of metal or any other material The valve housing **17** has a socket **18** therein into which a valve **20** can be threaded or pressed. Directly beneath the socket **18** is a needle **19** which is hollow throughout its length. The needle can be held in position in the valve housing **17** by a press fit or it can be glued in position or held in place by any known securing means. The gasket **21** prevents liquid gas from leaking back past the needle.

The needle **19** communicates with an open socket **22** in the valve housing **17**. The needle **19** is merely the preferable embodiment. The needle can be replaced by a plate (not shown) having an opening therein for the passage of gas. The plate would operate to actuate the nozzle **12**, which could be of the aerosol type, i.e. it is spring-biased to closed position of the refill to permit the flow of gas to the burner valve **20**.

The valve housing **17** has upper lands **23** which can be any number thereon which forms a cam surface. The cam surface has a gradual inclination from a low to a high point being in the form of a crown cam. The angle of the incline being a matter of choice, however, the rise of the cam must be sufficient to raise a valve opening member high enough to open the burner valve **20**.

Integral with the valve housing **17** is a spaced circumferential depending shroud **24** having a circular flange **25** integrally affixed thereto. The flange **25** functions as a gripping surface whereby the attachment **10** can be conveniently removed from the refill **11** and a convenient element to rotate to open and close the valve **20**. In this regard a striated or knurled gripping surface can be placed on the end of the flange.

A circumferential bead **26** on the depending shroud **24** serves to maintain a flame adjusting member **27** attached to the shroud **24**. The flame adjusting member **27** is preferably formed of a resilient material such as plastic such that by expanding its lower portion outwardly, it can be snapped over the bead **26**. When the adjusting member resumes its initial configuration, the bead **26** will prevent its removal from the shroud **24** except by forcing the adjusting member **27** away from the bead **26**. The upper portion of the adjusting member **27** is formed with a plurality of recesses **28** therein although any number can be chosen. A top wall **29** having an opening **30** therein serves as a connecting member to adjust the burner valve **20**. The burner valve can be a known valve such as shown and described in U.S. Pat. No. 2,571,435 filed June 11, 1949 and issued on Oct. 16, 1951 to Alexander L. Flamm. Basically the burner valve has a stem **31** which is reciprocally mounted in a bushing **32**, and a longitudinal tube **33** having a bore therethrough. The bushing **32** has splines **34** thereon which interengage with corresponding splines milled or otherwise formed into the opening **30** of the top wall **29**. A spring **36** can be used to maintain the valve stem **31** in closed position whereby no gas can flow through the orifice **37**, because a seal **38** bears firmly on the orifice. When the bushing **32** is rotated clockwise it moves inwardly by means of its threaded engagement with the fixed socket **39**. The bushing bears on the freely movable longitudinal tube **33** which is then forced against the capillary wick **40**. The wick functions to bring liquefied gas to the burner valve where it evaporates. By compressing the capillary wick **40** against the fixed sphere **41**, the flow of fuel can be regulated as more fully described in U.S. Pat. No. 2,836,044 filed on July 26, 1956 and issued on May 27, 1958 to Conrad Zellweger.

A valve lifter **43** which can be a ceramic, a metal or other material fits into the recesses **28** and an opening **44** therein surrounds the bushing **32**. A leg or a plurality of legs **45** depend from the valve lifter **43** and functions as a cam follower. The legs **45** extend through the opening **28** in the top wall **29** and rest on the lands **23**.

A plate **46** having an opening therein is removable secured to the stem **31** of the burner valve **20**. The plate serves to maintain the valve lifter **43** loosely held on the attachment **10** and when the cam **43** moves upwardly, it bears against the plate **46** which, since it is attached to the stem **30**, will be lifted also.

Integral with the lower portion of the shroud **24** is a depending circumferential skirt **47**. The skirt is formed of a plurality of fingers **48**. A circumferential rib **49** extends around the periphery of the fingers **48**. The fingers are separated by slots **50**. The fingers are preferably resilient and when they are forced from their rest position, they will return to rest position upon release of the force.

A ceramic cap **51** which can have cooling fins **52** thereon and an opening **53** therein is screwed or otherwise secured to member **27** to retain the valve lifter in place.

An abutment **54** on the shroud **24** bears against a rib **55** on the inner surface of the flame adjusting member **27**. The reason for this is that it conveys to the user a tactile feeding that the device has clicked to an "off" position.

Thus, when the protruding pointer **56** is adjacent the indicia O, the abutment **55** on the member **27** will have gone past the abutment **54** on the left side thereof as viewed in FIG. **2**, and the gas flow will be shut off. When the pointer **55** is moved to the indicia L, the abutment on the member **27** will pass the abutment **54** and the user will feel a slight restraint and the valve will open slightly such that a low flame will be produced when the gas is ignited. As the member **27** is rotated in a counterclockwise direction the valve will open to a greater extent thereby permitting more gas to flow until the pointer reaches the indicia M. At this point the rib **56** abuts the high stop **57** and the maximum flame height is reached. A similar low stop **58** is circumferentially spaced from the high stop and functions to prevent rotation past the closed indicia O.

The embodiment shown in FIGS. **9—12** comprises a valve housing **17** having a socket **18** therein into which a burner valve **20** is threaded or pressed. There is a needle **19** which functions as in the previous embodiment.

The modification differs from the previous embodiment basically in the type of valve lifter which is employed. The valve lifter **43*a*** shown in FIG. **10** is formed from a metal stamping although any known material and any known method can be employed to fabricate the lifter. The valve lifter **43*a*** comprises a plurality of legs **45*a*** having a tab **51** integral with and located at the terminal portion of each leg **43*a***. Each tab **51** has upturned ears **52** which form each leg into a cam follower which rides on the tapered lands **23**. In all other respects the valve lifter in the embodiment of FIGS. **9—12** functions like the valve lifter **43** previously described.

In actual operation, the attachment **10** is placed on the refill **11** by pressing the fingers **48** into the recess **15** on the refill. Because the fingers are resilient, they will be cammed inwardly of the shoulder **16** and then become locked in the recess **15** below the shoulder **16**. The needle **19** or other refill actuating means will then pierce or otherwise actuate the nozzle of the refill. The gas in the refill travels up the hollow bore of the needle **19** and into the capillary wick **40**. Since the stem **31** having a seal **38** on the end thereof is spring-biased into closed position, no gas can pass through the orifice **37**.

In order to initiate a flow of gas, the user must rotate the adjusting member **27**, which can have a roughened surface, in a counterclockwise direction with respect to the flange **25**. Conversely, the flange **25** can be rotated with respect to the adjusting member **27**. As the member **27** is rotated, the rib **56** moves over the abutment **54** and the valve lifter is raised by the inclined lands **23**. The depending legs **45** of the cam lifter follow the rising cam surface and is thereby lifted upwardly away from the refill until it abuts the plate **46**. Since the plate **46** is secured to the stem **31**, the stem and seal **38** move upwardly to permit gas to flow through the bore in the stem to the atmosphere. The issuing gas can then be ignited. The size of the flame can be adjusted by rotating the adjusting member **27** within a predetermined limit between indicia L and M so as not to shut off the flow of gas. Rotation of the member **27** causes rotation of the bushing **32** to which it is splined. The bushing threads its way into the socket **39** and forces the longitudinal tube **33** to compress the capillary wick **40**. Since the flow of gas is thereby limited or is made more plentiful, depending upon the pressure exerted on the wick, the flame height will be lowered or raised to suit the needs of the user. To shut off the flow of gas the adjusting member is rotated in a clockwise direction and when the rib **56** goes over the abutment **54**, the user can feel that the unit has been shut off.

While there has been shown and described a single embodiment of the invention, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention, and that it is intended by the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to be secured by Letters Patent of the United States is:

1. An attachment for a refill containing fuel therein comprising,

a. a valve housing having a socket therein for the reception of a burner valve,

b. a burner valve mounted in the socket, said burner valve having a passage therethrough culminating in a burner mouth for the release of fuel to the atmosphere, said burner mouth extends slightly and axially above the socket wherein a flame is produced which is contiguous with the mouth of the burner valve and adjacent the valve housing so as to form a compact decorative attachment for a refill,

c. an enclosure member housing a refill actuating means therein which is fixed to the valve housing and is adapted to actuate a valve on the refill to initiate a flow of fuel to the burner valve,

d. resilient fingers on the valve housing adapted to removably attach the attachment to a refill.

2. An attachment as defined in claim **1** in which adjusting means is rotatably mounted on the valve housing and is attached to and circumscribes the burner valve such that rotation of the adjusting means serves to adjust the flow of fuel through the burner valve.

3. An attachment as defined in claim **2** in which a nonheat conducting cap is mounted above the valve housing and above the mouth of the burner valve whereby the user is shielded from the flame when adjusting the flame height.

4. An attachment combined with a refill in which the combination comprises,

a. a flame producing member comprising an inner fixed member and a burner valve on the fixed member, an outer flame adjusting member circumscribing said inner fixed member and having means thereon to adjustably rotate the burner valve to vary the flame size,

b. a skirt depending from the flame producing member,

c. a resilient circumferential rib surrounding at least a portion of the depending skirt,

d. a recess on the upper portion of the refill which receives the depending skirt of the flame producing member, and

e. a shoulder above the recess on the refill into which the rib frictionally engages to maintain the refill engaged with the flame producing member, and

f. gas flow means interconnecting the refill and the flame producing member.

5. An attachment for a refill containing fuel therein comprising,

a. a valve housing having a socket therein for the reception of a burner valve,

b. a burner valve mounted in the socket,

c. an enclosure member housing a refill actuating means therein which is fixed to the valve housing and is adapted to actuate a valve on the refill to initiate a flow of fuel to the burner valve,

d. resilient fingers on the valve housing adapted to removably attach the attachment to a refill,

e. means indicating that the flow of fuel has stopped and has started,

f. the valve housing has a raised surface thereon in the form of a cam and a valve lifter mounted adjacent the burner valve in which the valve lifter has a portion thereof in contact with the cam and a portion in contact with the adjusting member such that movement of the adjusting member causes the valve lifter to actuate the burner valve thereby permitting fuel to issue from the burner valve.

6. An attachment for a refill containing fuel therein comprising,

a. a valve housing having a socket therein for the reception of a burner valve,

b. a burner valve mounted in the socket,

c. an enclosure member housing a refill actuating means therein which is fixed to the valve housing and is adapted to actuate a valve on the refill to initiate a flow of fuel to the burner valve,

d. resilient fingers on the valve housing adapted to removably attach the attachment to a refill,

e. adjusting means is rotatably mounted on the valve housing and is attached to and circumscribes the burner valve such that rotation of the adjusting means serves to adjust the flow of fuel through the burner valve,

f. the valve lifter comprises a member having at least one

depending leg thereon such that the depending leg can contact the cam and a plate fixed to the burner valve and located adjacent the valve lifter such that movement of the valve lifter causes a corresponding movement in the plate.

7. An attachment for a refill containing fuel therein comprising,

a. a valve housing having a socket therein for the reception of a burner valve,

b. a burner valve mounted in the socket,

c. an enclosure member housing a refill actuating means therein which is fixed to the valve housing and is adapted to actuate a valve on the refill to initiate a flow of fuel to the burner valve,

d. resilient fingers on the valve housing adapted to removably attach the attachment to a refill,

e. means indicating that the flow of fuel has stopped and has started,

f. the valve housing has a raised surface thereon in the form of a cam and a valve lifter mounted adjacent the burner valve in which the valve lifter has a portion thereof in contact with the cam and a portion in contact with the adjusting member such that movement of the adjusting member causes the valve lifter to actuate the burner valve thereby permitting fuel to issue from the burner valve,

g. the valve lifter further comprises a tab fixed to the outer end of the depending leg and having ears which extend upward and outward from the sides of the tab to gradually raise the valve lifter onto the cam surface.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3583846 Dated June 8, 1971

Inventor(s) Everett Kimball

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the specification

Column 2, line 4, before "a" first occurrence, insert --in--

Column 3, line 7, change "removable" to --removably--

Column 3, line 25, change "feeding" to --feeling--.

Signed and sealed this 11th day of January 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Acting Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334