June 3, 1969 S. H. NEWMAN 3,447,882

DISPOSABLE CIGARETTE LIGHTER

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FIG. 1

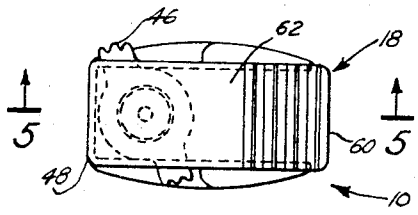

FIG. 2

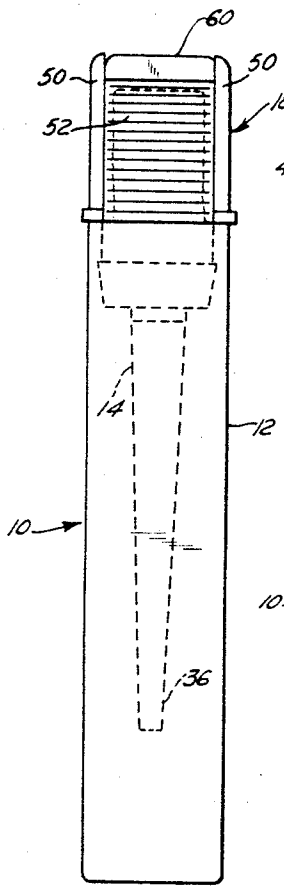

FIG. 3

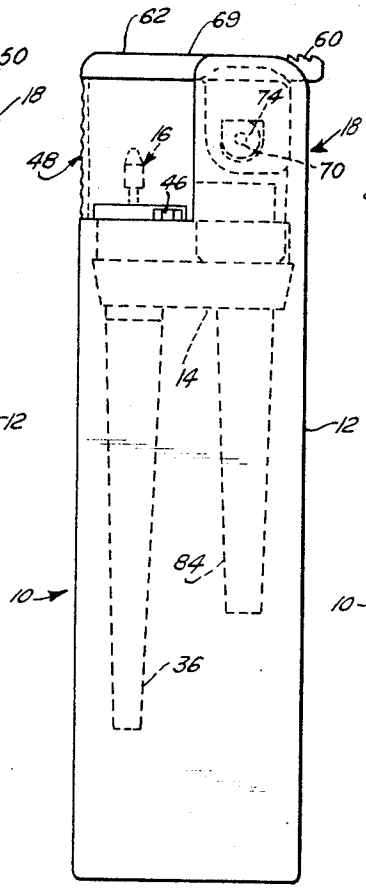

FIG. 4

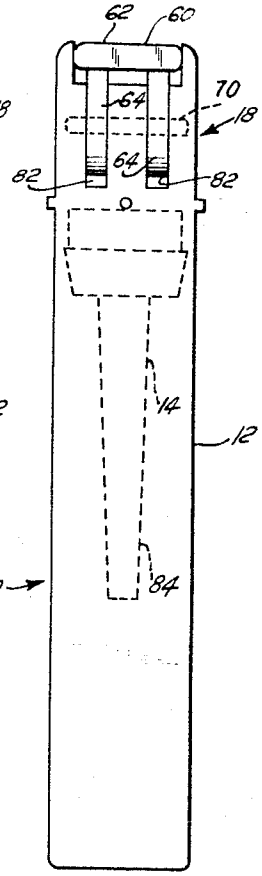

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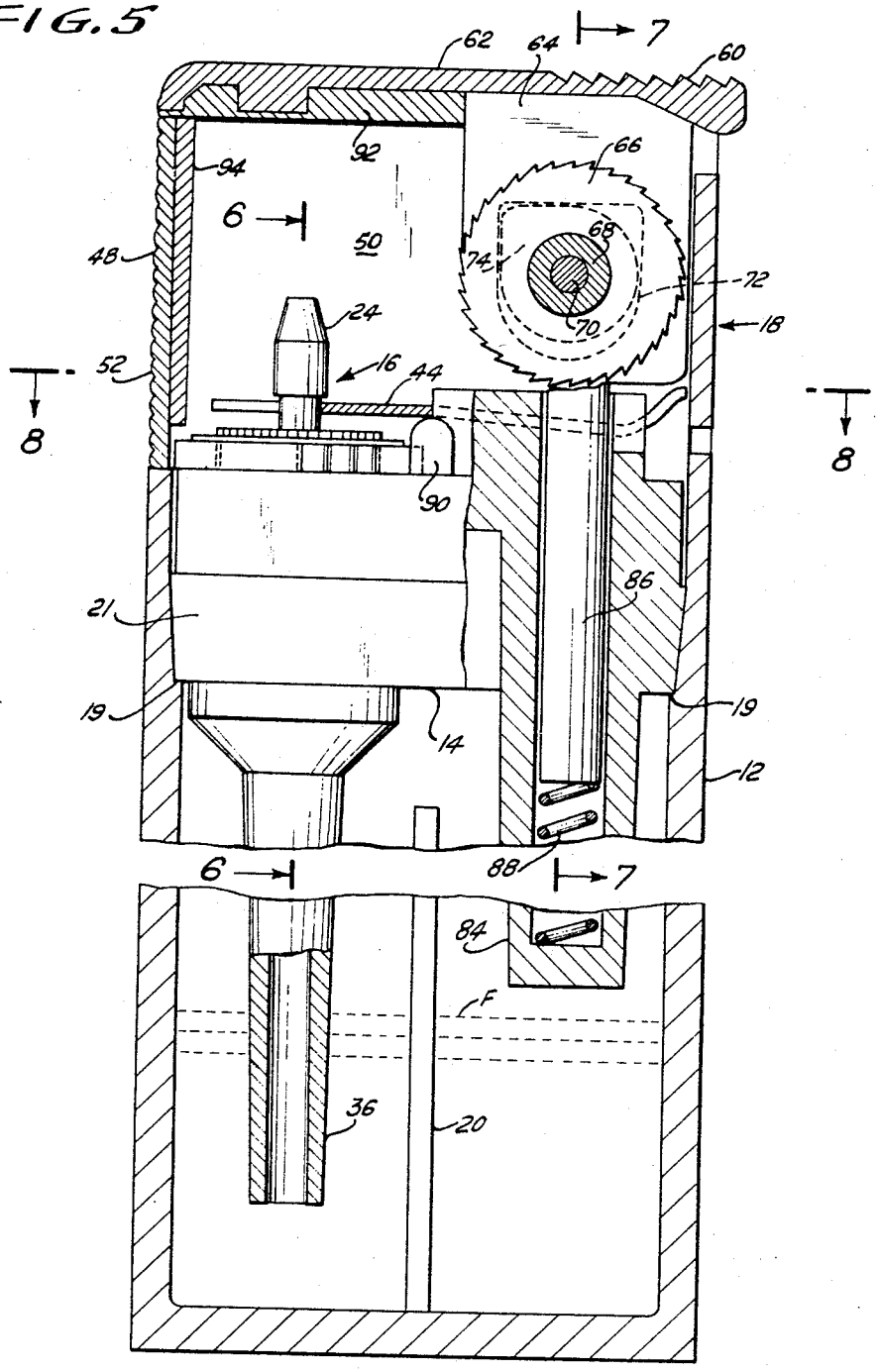
FIG. 5



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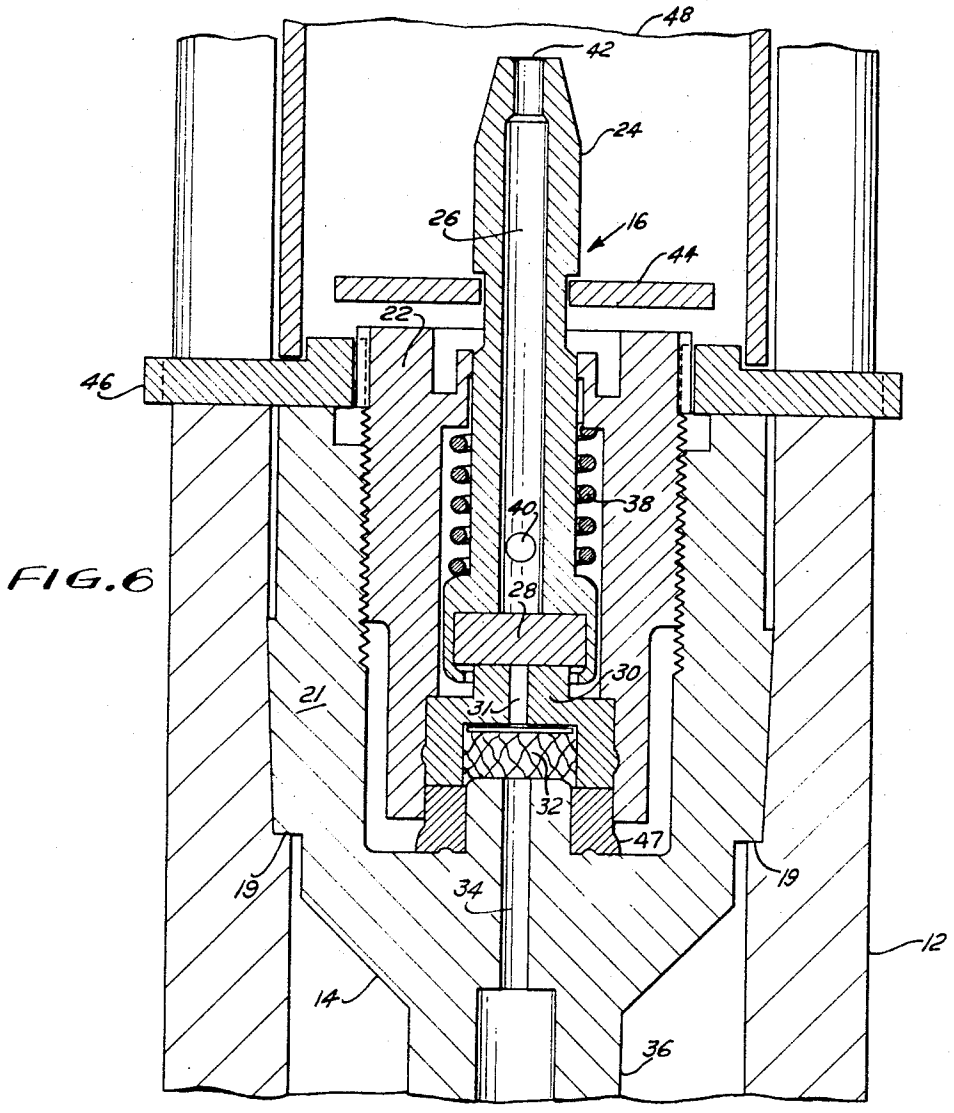

FIG. 6

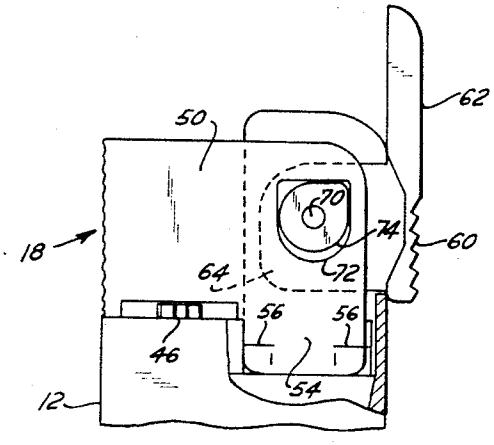

FIG. 9

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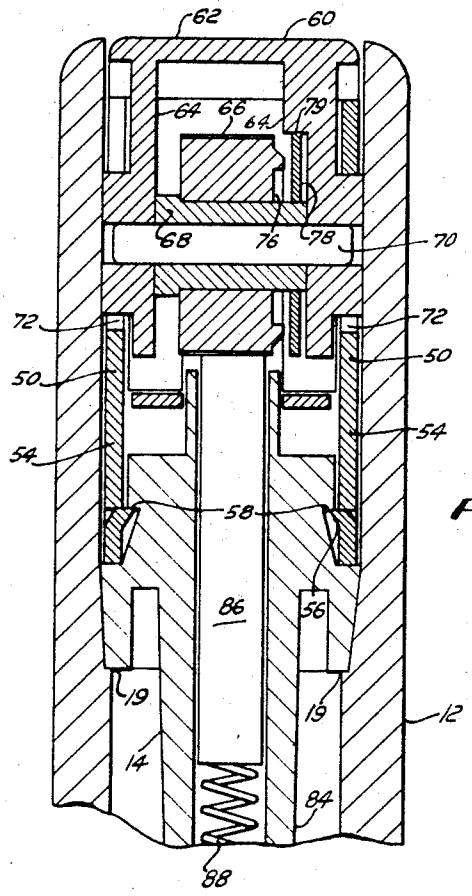
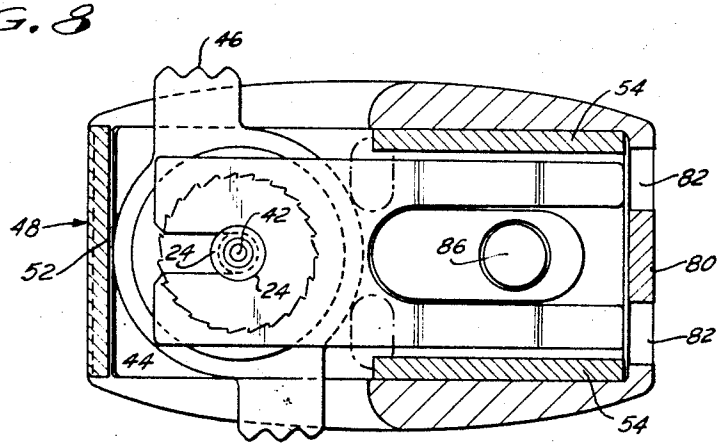


FIG. 7

FIG. 8



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3,447,882

DISPOSABLE CIGARETTE LIGHTER

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Int. Cl. F23q 2/08, 1/04
U.S. Cl. 431—131 6 Claims

ABSTRACT OF THE DISCLOSURE

A cigarette lighter using liquified gaseous fuel containing a gas valve and sparkwheel system for igniting escaping fuel, the lighter being characterized by a fingerpiece mechanism which is mounted by movable means so that the fingerpiece may be maintained in open and closed positions at the extremes of its rotation whereby the valve is opened and closed.

This invention relates to cigarette lighters of the type using liquified gas such as butane for fuel, and more particularly to a lighter which may be thrown away after the initial supply of fuel has been exhausted.

In recent years gas fueled lighters (popularly called "butane lighters") have become more and more popular due to the fact that a large supply of gaseous fuel in liquified form can be stored in the lighter in a relatively small space. It is possible to store in a space of about ¼ cubic inch volume sufficient liquified gas to supply the necessary fuel in normal usage for a period of several months.

The usual means of refilling a gas cigarette lighter is by use of a separate disposable tank (such as shown in U.S. Patent No. 2,943,471) or by what is called a refill system (such as shown in U.S. Patent No. 2,743,597) whereby liquified gas from a large supply container is allowed to flow into a reservoir contained within the lighter. Lighters of these types are relatively expensive since they must be made of exceptionally durable material since they are expected to work for years. As a result, the cost of the material going into such lighters is quite high. Attempts have been made heretofore to provide disposible non-refillable lighters of the gas type. However, as far as it is known, none of the so-called disposable lighters have been successful.

Accordingly, it is an object of the present invention to provide a disposable gas fuel lighter which is economical to manufacture, easily operated, safe and usable over a long period of time until the fuel supply is exhausted by means of normal usage.

In the accompanying drawings an embodiment of the present invention is illustrated, and it is described in detail in this specification. However, it is to be understood that the illustrated embodiment is for the purpose of fully disclosing to those skilled in the art the present invention and it is not to be interpreted as a limitation upon the scope of the invention which is to be determined by the claims attached hereto.

In the drawings:

FIGURE 1 is a top plan view of a disposable lighter in accordance with the present invention;

FIGURE 2 is a front side view of the lighter of FIGURE 1;

FIGURE 3 is a side view of the lighter of FIGURE 1;

FIGURE 4 is a rear view of the lighter of FIGURE 1;

FIGURE 5 is a partial fragmentary side sectional view of the lighter of FIGURE 1 taken along and in the direction of lines 5—5 of FIGURE 1;

FIGURE 6 is an enlarged fragmentary side sectional view of the valve and burner assembly along lines 6—6 of FIGURE 5;

FIGURE 7 is a sectional view along lines 7—7 of FIGURE 5;

FIGURE 8 is a sectional view along lines 8—8 of FIGURE 5; and

FIGURE 9 is a fragmentary side view of the present lighter showing the fingerpiece in an open position.

Referring to the drawings and to FIGURES 1 through 5 in particular, a lighter **10** in accordance with the present invention is shown. The lighter **10** includes a casing **12** which may be made of any moldable plastic material such as polyethylene, polypropylene, polyvinyl chloride or any similar material which is at least resistant to the liquified gaseous fuel. The casing **12** is advantageously open at its upper end so that a valve and flint support **14** may be inserted into the casing. In turn, a valve and burner assembly **16** is placed within the support **14**.

A head mechanism **18** is provided and it is also inserted at least partially into the casing **12** and in contact with the valve and burner assembly **16**. To insure that the casing **12** will properly support the valve and flint support **14**, as well as the head mechanism **18**, a stiffener **20** is provided in the form of a rib within the casing **12**.

An interior shoulder **19** is provided within the casing **12** and it is upon this shoulder that the valve and flint support **14** rests. To insure a gas type fit between the support **14** and the casing **12** a suitable adhesive may be used to hold the support **14** securely in place.

As shown in FIGURES 5 and 6 in particular, the support **14** includes a valve body **21** into which is positioned a valve cap **22** by means of screw threads. Contained within the valve cap **22** is a burner tube **24**, through which there extends a bore **26**. At the lower end of the bore **26** a valve seal **28** of suitable gas resistant material such as neoprene is provided. Also contained within the valve cap **22** and positioned directly beneath the valve seal **28** is a valve seat. **30**. The valve seat **30** has a vertical opening **31** therein and it overlies a fuel pad **32**. The fuel pad **32** in turn is positioned over a bore **34** in the valve body **21**. The bore **34** in turn is in communication with a tube **36** which extends well into the lower portion of the casing **12** and is in contact with the supply of liquified gas fuel F. The fuel F in the casing **12** is usually butane maintained in a liquified form under slight pressure so that it will change to a gas when exposed to atmospheric pressure. It is by means of the fuel pad **32** that the liquified gas F is exposed to atmospheric pressure. This occurs when the burner tube **24** which is normally maintained in a closed position by means of a burner spring **38** is raised upwardly. The upward movement of the burner tube **24** lifts the valve seal **28** away from its covering engagement with the opening **31** in the valve seat **30**. This permits the fuel to volatilize from the pad **32**, flow through the opening **31** around the lower end of the burner tube **24** and then through a port **40** which communicates with the bore **26** in the burner tube **24**. The gas continues to flow through the bore **26** and out through the burner opening **42**.

The means of igniting the gas flowing from the opening **42** will be discussed hereinafter.

In order to raise the burner tube **24** so that gas may escape through the opening **42**, a bifurcated valve lifter **44** is provided. The amount of fuel which escapes through the opening **42** is determined by the degree of pressure which is exerted by the valve seat **30** against the fuel pad **32**; the greater pressure the less the flow of fuel. The degree of pressure is regulated in a coarse adjustment by means of the threaded connection between the valve body **21** and the valve cap **22**. For a fine flame adjustment an adjuster **46** is fitted about the upper portion of the valve cap **22** in wrench-like fashion so that a slight movement of the cap **23** may be made relative to the body **21**.

In order to prevent any escape of fuel inadvertently

from the pad **32** in a direction other than through the opening **31**, an O-ring **47** is provided beneath the valve seat **30**, as shown in FIGURE 6.

The head mechanism **18** includes a U-shaped support frame **48** consisting of a pair of arms **50** and a center portion **52**. Extending downwardly from the arm **50** are tabs **54** which are provided with inwardly stamped notches **56** which act as detents. In order to insert the head mechanism into fixed contact with the valve and flint support **14**, the support frame **48** with the attached head mechanism is pressed downwardly so that the notched detents **56** engage shoulders **58** provided on the support **14**.

As shown in FIGURES 5 through 8 in particular, in order to activate the valve lifter **44** so that fuel may escape from the opening **42**, as well as to create a field of sparks to ignite the escaping fuel, a fingerpiece **60** is rotatably mounted on the support frame **48**. The fingerpiece **60** includes a top portion **62** and downwardly extending arms **64**. A sparkwheel **66** is mounted on the arms **64** by means of a sparkwheel bearing **68** through which is extended a support pin **70**. The pin **70** extends through the cutouts **72** in the arms **50** of the support frame **48**. On each end of the pin **70** a cam bearing **74** is provided and the bearing **74** is positioned within the cutout **72**. The sparkwheel **66** has a ratchet plate **76** mounted on one side thereof. To rotate the sparkwheel **66** with its attached ratchet plate **76**, a pawl plate **78** is provided and rotatably positioned about the sparkwheel bearing **68**. The plate **78** abuts against a portion **79** of the fingerpiece **60** so that the plate **78** is rotated whenever the fingerpiece **60** is rotated.

In order to permit the fingerpiece **60** to be rotated, the rear portion **80** of casing **12** is fitted with cutouts **82** for arm **64**.

When the fingerpiece **60** is rotated, the sparkwheel turns causing a field of sparks to be generated since there is provided within the flint holder **84** a flint **86** which is pressed against the sparkwheel by a spring **88**.

As the fingerpiece **60** is rotated, the arms **64** contact the rear portion of the valve lifter **44** causing it to be pivoted about a fulcrum **90**. The bifurcated front end of the lifter then contacts the burner tube **24** and opens the valve as discussed previously.

As shown in FIGURES 5 and 9 in particular, the mounting of the fingerpiece **60** is not rigidly fixed. The bearing cams **74** advantageously permit a floating action to be obtained. Since the size of the openings **72** in the arms **50** of the support frame **48** is greater than the cam bearing **74** the action of the flint spring **88** on the flint **86** and in turn the sparkwheel **66** causes the bearing **74** to be urged upwardly within the cutout **72** so that the fingerpiece is positively cammed into a closed position. By this same floating arrangement when the fingerpiece is rotated to an open position, as shown in FIGURE 9, the bearing **74** acts to cam the fingerpiece into its open position by riding downwardly within the cutouts **72**.

The cutout and cam arrangement utilizes the spring pressure of the flint spring **88** and eliminates the necessity for a special closure spring for the fingerpiece.

It will be noted that many of the components of the illustrated lighter may be molded of plastic "materials" eliminating the need for expensive metal parts and costly machining. For example, the valve cap **22** is made of a suitable moldable plastic as are the flame adjuster **46**, the fingerpiece **60** and the cam bearings **74**. Of course, the entire valve and flint support **14** is made of a single integrally molded piece.

By utilizing moldable plastic materials to a large degree and by eliminating special closure springs for the fingerpiece, the cost of the present cigarette lighter is substantially reduced.

If desired, a protective metal screen or shield can be provided in the area of the head mechanism adjacent to the top opening **42** in the burner tube **24**. A metal shield **92** may be placed on the under surface portion of the top **62** of the fingerpiece **60**. Also, a metal shield **94** may be placed within the frame work of the support frame **48** in order to protect an outer finish of the frame piece. The shields **92** and **94** act as flame protectors.

In the claims:

1. A cigarette lighter of the type described including a casing for holding a supply of liquified gaseous fuel, an integral valve and flint support carried by said casing, a valve and burner assembly of the lift type mounted in said support, a valve lifter for activating said valve, a spring loaded flint inserted into an opening in said support, a head mechanism including a frame member, a rotatably mounted fingerpiece, a sparkwheel and sparkwheel rotating means, said head mechanism mounted on said support, said sparkwheel contacting the flint, means for movably mounting said sparkwheel and fingerpiece whereby when the fingerpiece is rotated, the valve is opened releasing a stream of gaseous fuel and the sparkwheel is rotated against the flint generating a field of spark into the stream of gaseous fuel, said movable means adapted to maintain the fingerpiece in open and closed positions at the extremes of its rotation under the pressure of the spring loaded flint.

2. A cigarette lighter as defined in claim **1** wherein the means for movably mounting the sparkwheel includes cutout portions in the frame member, a pin for rotatably mounting the sparkwheel on its transverse axis, bearing cams positioned in the cutouts and mounted on the pin and said bearing cams being free to move within the cutout portions.

3. A cigarette lighter as defined in claim **1** wherein the fingerpiece includes a top portion adapted to be rotatable to a position covering the burner and a pair of flanges projecting from said top portion, openings in said flanges for a pin, said pin mounting the sparkwheel and the fingerpiece on the flame member.

4. A cigarette lighter as defined in claim **1** wherein the integral valve and flint support is made of molded plastic and includes a flint holder, a valve body and a fuel tube.

5. In a cigarette lighter of the type having a rotatable fingerpiece, a mounting frame, a sparkwheel having a transverse axis, a flint contacting the sparkwheel and a spring exerting pressure on the flint, an improved means for movably mounting the sparkwheel including a pin for rotatably mounting the sparkwheel, a cutout in the mounting frame, a bearing cam positioned in the cutout and mounted on the pin, said sparkwheel axis adapted to be movable to the extent of the movement of the cam within the cutout, said cam being urged against the periphery of the cutout by the pressure of the flint spring against the sparkwheel, whereby the fingerpiece is urged into open and closed positions at the extreme of its rotation.

6. In cigarette lighters of the type described in claim **5** wherein the improved means further includes opposite wall portions on the frame with cutouts in each wall portion and bearing cams mounted on opposite ends of the pin and positioned in the cutouts.

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U.S. Cl. X.R.

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