April 26, 1960 L. F. RITCHIE 2,933,911

CIGARETTE LIGHTER

Filed Jan. 19, 1959 2 Sheets-Sheet 1

FIG. 1.

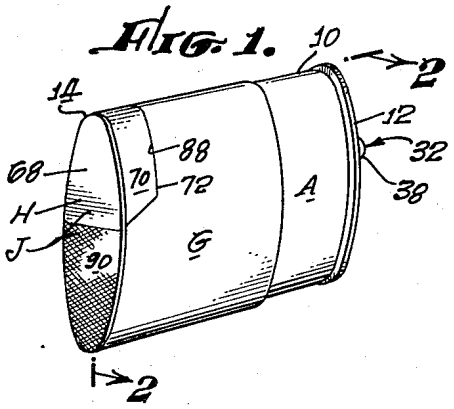


FIG. 4.

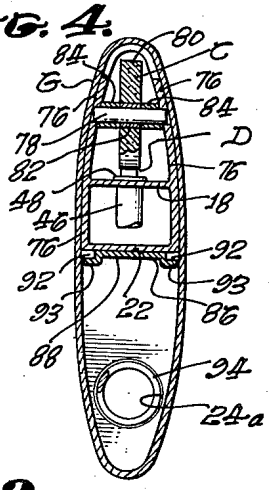


FIG. 2.

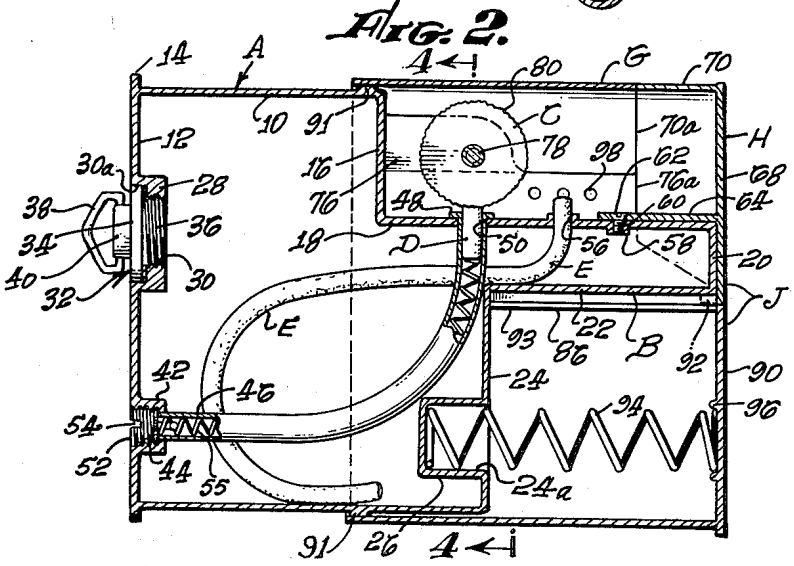


FIG. 5.

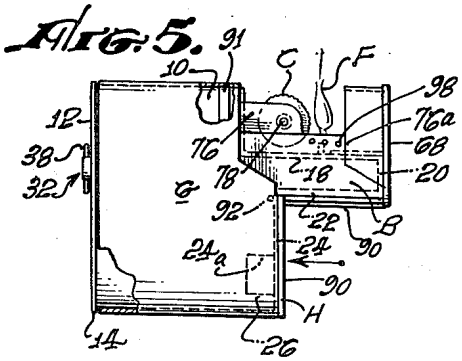
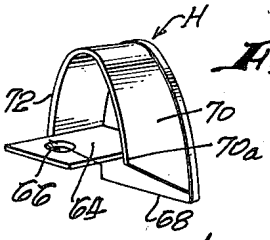


FIG. 3.



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Filed Jan. 19, 1959 2 Sheets-Sheet 2

FIG. 6.

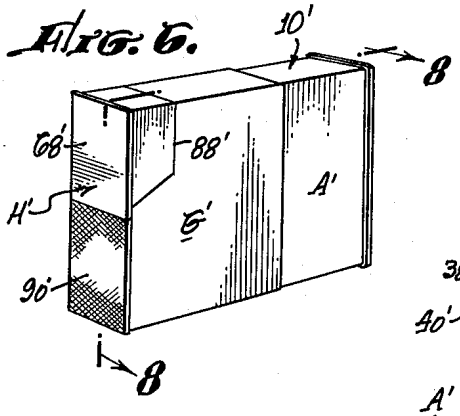


FIG. 7.

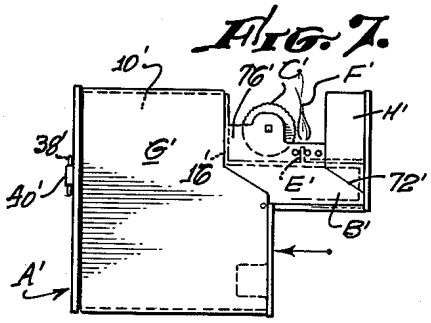


FIG. 8.

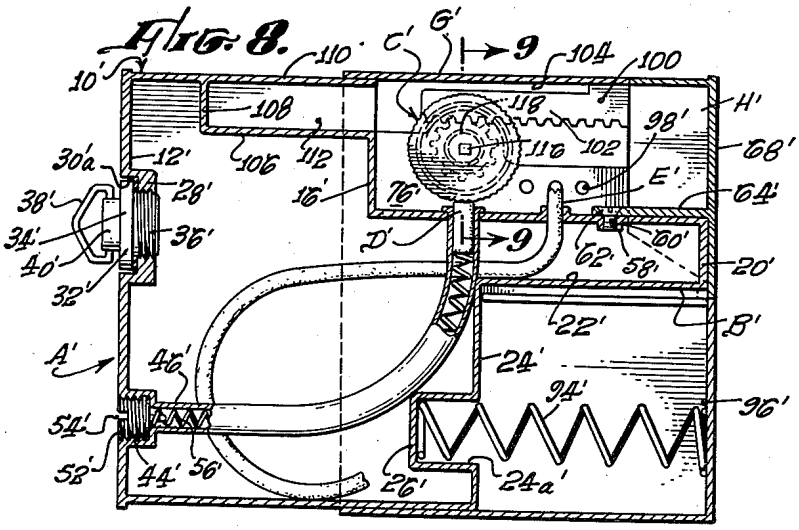
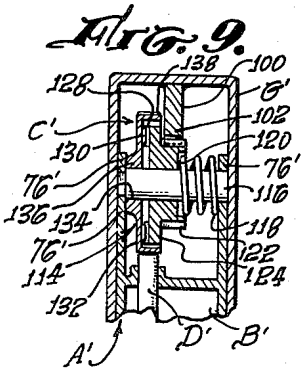


FIG. 9.



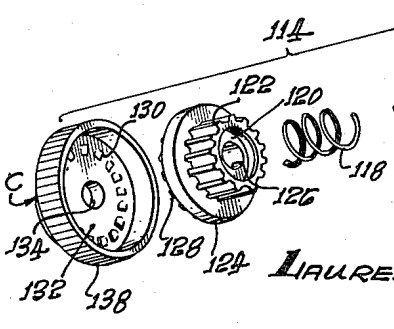
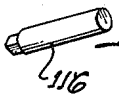


FIG. 10.



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CIGARETTE LIGHTER

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Application January 19, 1959, Serial No. 787,497

12 Claims. (Cl. 67—7.1)

The present invention relates generally to the field of lighting devices, and more particularly to an improved cigarette lighter.

A major object of the present invention is to provide a pocket lighter that is free of pivotally supported or hinged covers which are subject to wear and breakage.

A further object of the invention is to provide a cigarette lighter of simplified structure that is compact and durable, and substantially impervious to damage should it be inadvertently dropped.

A still further object of the invention is to provide a pocket lighter which while compact, has substantially greater fuel capacity than lighters currently on the market, requires a minimum of maintenance attention, and may be carried either loosely in the pocket, or easily affixed to a chain or similar flexible member that is connected to the wearing apparel of the user.

A further object of the invention is to provide an improved cigar and cigarette lighter which not only has substantial operational advantages over pocket lighters available heretofore, but one that is distinctive and ornamental in appearance.

These and other objects and advantages of the present invention will become apparent from the following description of the first and second forms thereof, and from the accompanying drawing illustrating those forms in which:

Figure 1 is a perspective view of the exterior of the first form of the invention;

Figure 2 is a longitudinal cross-sectional view of the device taken on line 2—2 of Figure 1;

Figure 3 is a perspective view of a stop, which not only serves this function but also defines an external end portion of the invention;

Figure 4 is a fragmentary transverse cross-sectional view of the invention taken on line 4—4 of Figure 2;

Figure 5 is a side elevational view of the first form of the invention shown after it has been manually moved to a position to supply a flame;

Figure 6 is a perspective view of the second form of the invention;

Figure 7 is a side elevational view of the second form of the invention shown in a position to supply a flame;

Figure 8 is a transverse cross-sectional view of the second form of the invention taken on line 8—8 of Figure 6;

Figure 9 is a fragmentary transverse cross-sectional view of the second form of the invention taken on line 9—9 of Figure 8; and,

Figure 10 is an exploded perspective view of the rotatable spark-supplying wheel and the clutch mechanism utilized in driving same in one of two possible directions.

With further reference to the drawings for the general arrangement of the first form of the invention, it will be seen to include a liquid fuel container A having a forwardly extending projection B that rotatably supports a wheel C, which when rotated in contact with a flint D, causes sparks to be emitted that ignite the

fuel in a wick E to provide a flame F. As shown in Figure 1, container A is preferably of elliptical transverse cross section and has a cover G slidably mounted on the exterior surface thereof, which cover is also of elliptical transverse cross section. A stop H is removably affixed to the forward extremity of projection B, and this stop not only serves this function but defines an end portion of the lighter when it is in the normal carrying position shown in this figure.

In detail, container A includes an elongate first shell 10 of transverse elliptical cross section, one end of which terminates in an end plate 12 (Figures 1 and 2). End plate 12 is preferably of larger transverse area than shell 10 to thereby provide a continuous outwardly projecting flange 14 that is not only decorative in appearance, but serves as a stop for the rearward movement of cover G, as may be seen in Figure 5. The upper forwardly disposed end portion of shell 10 terminates in a first end piece 16, the edge portion of which is flush with the exterior surface of container A. The lower edge of end piece 16 develops into a forwardly extending rigid strip 18, and the forward extremity of this strip turns downwardly to form a second strip 20 that is bent or otherwise formed to provide a third strip 22 which returns rearwardly parallel to the first strip. The rear extremity of strip 22 develops into a second end piece 24 that is parallel to first end piece 16 but is disposed forwardly thereof.

The first, second and third strips described above, as well as the second end piece 24, are bonded as by welding or the like, to projection B and the lower edge portion of shell 10, as shown in Figures 2 and 4. An opening 24*a* is formed in end piece 24 from which a cup-shaped member 26 of relatively small transverse cross section extends rearwardly. The upper portion of end plate 12 is formed with a forwardly extending boss 28 having a tapped bore 30 extending therethrough which terminates in the most rearwardly disposed portion of boss 28 in a recessed portion 30*a* of larger transverse cross-sectional area than that of bore 30. Bore 30 is threadedly engaged by a threaded plug referred to generally by the numeral 32, the structure of which is shown in detail in Figure 2. Plug 32 includes a circular plate 34 of a size to permit the snug fit thereof within the confines of recess 30*a*. This plate also has a threaded member 36 which projects forwardly therefrom that is adapted to be removably disposed in tapped bore 30. A handle 38, preferably in the form of a bifurcated member, is provided that is pivotally supported in a member 40 of U-shaped transverse cross section and affixed to the rear surface of plate 34. A second boss 42 is formed on the forward interior surface of the lower portion of end plate 12, and a tapped bore 44 is formed in this boss.

A small diameter tube 46 extends forwardly and upwardly from the forward extremity of bore 44, and terminates in a flanged end 48 that projects through an opening 50 formed in second strip 18. An externally threaded plug 52 is threadedly inserted within the confines of bore 44, and this plug preferably has a transverse slot 54 formed on the rear face thereof which is adapted to be engaged by a ten-cent piece or small screw driver to permit unscrewing of the plug from bore 44.

A helical spring 55 that is at all times under compression is situated within the confines of tube 46 and at all times tends to urge flint D upwardly into contact with the spark-generating wheel C. A slightly flanged opening 56 is formed in second strip 18 forwardly from wheel C, and wick E projects through this opening, as best seen in Figure 2.

A third inwardly extending boss 58 is formed in the forward interior portion of projection B and a tapped

bore 60 extends downwardly therein that may be engaged by a screw 62. Stop H (Figure 3) includes a rigid supporting member 64 in which an opening 66 is formed and through which screw 62 can extend downwardly to engage tapped bore 60 to hold stop H in the position shown in Figure 2. The forward extremity of member 64 is affixed to an elliptical first segment 68 of sheet material.

An elliptical section 70 extends rearwardly from segment 68 and the free ends thereof terminate in forwardly and downwardly tapering edges 72. Two parallel, laterally spaced side members 76 are provided, the rearwardly and downwardly disposed edges of which are affixed to second strip 18. The external surfaces of side members 76 are flush with the external surface of container A. Two horizontally aligned bores are formed in members 76 through which a shaft 78 projects. Wheel C is of the type commonly utilized in cigarette lighters having a knurled circumferentially extending surface 80 and a central bore extending transversely therethrough in which a brass sleeve 82, or other tubular insert, is mounted to freely and rotatably support wheel C on shaft 78. Two identical tubular sleeves 84 are mounted on shaft 78 on opposite sides of wheel C. The outer ends of sleeves 78 bear against the interior surfaces of side member 76 and the interior ends of these sleeves are positioned adjacent to wheel C. Sleeves 84 serve as spacers to prevent any appreciable lateral movement of wheel C on shaft 78. Side members 76, as can best be seen in Figures 2 and 4, extend forwardly on second strip 18, with the foremost vertical edges 76*a* thereof abutting against the lower opposing edge portions 70*a* of stop H.

The lower exterior surface of strip 18 supports a longitudinally extending member 86 which includes a web 88 having identical longitudinally extending guides 93 formed on or supported from opposite edges thereof. Each of the guides 93 are of L-shaped transverse cross section.

The cover G, as shown in Figures 1, 2 and 4, is an elongate second shell of elliptical transverse cross section, and two oppositely disposed, longitudinally extending rails 92 are provided on the interior surface thereof that slidably engage guides 93. Cover G is of such transverse cross section as to permit snug, slidable engagement thereof with the exterior surface of a flat raised band 91 that encircles container A (Figure 5). The purpose of band 91 is to prevent scratching or marring of container A as a result of repeated rearward and forward sliding movement of cover G. The upwardly and forwardly disposed portion 88 of cover G is cut away to such an extent that the side wall 70 and segment 68 thereof define a portion of the cover when it is in the foremost position on container A as seen in Figure 1. A second elliptical segment 90 formed of a rigid sheet material is bonded, welded or otherwise affixed to the forward edges of cover G (Figures 1 and 6), and as best shown in Figure 2, together with segment 68 cooperatively provides a second end plate generally designated by the letter J of the lighter when it is in the position shown in Figure 1.

Cover G at all times tends to remain in the forward position shown in Figure 1 due to a compressed helical spring 94 situated within the confines thereof. The rearwardly disposed end portions of spring 94 are situated within the cavity-defining portion 26 of the third strip 24, and the forward end of spring 94 abuts against the interior surface of segment 90 and is situated within the confines of a ring 96 affixed thereto. Ring 96 serves to prevent inadvertent displacement of the forward end of spring 94 out of abutment with the interior surface of segment 90. It will be obvious that the device is assembled by placing spring 94 within the confines of cover G (Figure 2), slidably inserting the cover onto container A, then causing screw 62 to project through bore 66 and engage tapped bore 60 to hold the stop H in the position shown in Figures 1, 2 and 5.

The present invention is used by first disengaging the threaded member 36 from the tapped bore 30 in order to pour fuel into the confines of container A therethrough onto absorbent cotton or other absorbent medium (not shown) situated therein. The liquid fuel passes from this absorbent material to the wick E. A flint D is placed within the confines of tube 46 and moved upwardly therein by application of longitudinal force on spring 56. After spring 56 is fully inserted within the confines of tube 46 it is maintained therein by causing plug 52 to threadedly engage tapped bore 44.

When it is desired to use the invention above described, the lighter is grasped in the hand and the thumb placed in contact with the lower rear portion of end plate 12, with the forefinger contacting the exterior surface of segment 90. The thumb and forefinger are then cooperatively moved to cause rearward movement of cover G relative to container A until the rear edge of the cover abuts against the forward edge of flange 14. It is then possible to manually rotate wheel C to generate sparks thereby as the wheel frictionally contacts flint D to ignite wick E and provide the flame F. Wick E is preferably formed of asbestos. To facilitate clean combustion of the fuel burning from wick E, a number of perforations 98 are formed in the forward portion of side members 76 to provide adequate oxygen for combustion of the fuel.

It will be particularly noted that while the first form of the device permits free movement of the cover from the closed position shown in Figure 1 to the open position shown in Figure 5, this movement is made possible by virtue of guides 93 and rails 92 that are durably maintained in fixed longitudinally extending positions, and are sufficiently heavy, as well as protected to prevent deformation of cover G and container A should the invention be inadvertently dropped, receive a sharp blow, or the like. This construction avoids the necessity of pins, hinges or other delicate mechanisms which are subject to wear and prone to get out of order, and as a result thereof the present invention requires substantially no maintenance attention. Also, it will be noted that within the confines of container A projection B provides additional space wherein a substantial quantity of liquid fuel may be disposed whereby the lighter of the present invention does not require the frequent fueling so commonly required with present-day cigarette lighters which normally have but a limited fuel capacity.

The second form of the invention is in many respects identical structurally to the first form of the device. However, the second form has an additional operational advantage in that as the cover thereof is moved rearwardly relative to the container, this movement causes automatic ignition of the wick. To illustrate the susceptibility of the invention to fabrication in a number of different styles, the second form thereof is shown in rectangular cross section rather than the elliptical cross section employed in the first form of the device. Inasmuch as the majority of the components comprising the second form of the invention are the same as utilized in the first form thereof, those components common to the first form are identified by the same identifying numerals used in describing the first form, except that a prime is added thereto for the purpose of clarity.

In Figure 7 it will be seen that as in the first form of the invention, a liquid fuel container A′ is provided that has a forwardly extending projection B′ that rotatably supports a wheel C′, which when rotated in frictional contact with a flint D′ causes sparks to be emitted which ignite the fuel in a wick E′ to give a flame F′. The fabrication of container A′ is identical to the structure of container A previously described, except that container A′ is rectangular in transverse cross section. The stop H′ is likewise identical to stop H except that stop H′ is also of rectangular cross section.

Cover G' is identical to the cover G previously described except that cover G' is of rectangular configuration and a downwardly extending rigid member **100** is affixed to the upper forward interior surface thereof which supports a rearwardly extending rack **102** that is separated by a space **104** from the upper interior surface of cover A'. In the second form of the invention container A' is modified in that the end piece **16'** terminates a substantial distance below the upper interior portion of shell **10'**, and develops into a rearwardly extending flat member **106**, the rear end of which turns upwardly at approximately 90° to form a second member **108**. Members **106** and **108** are welded or otherwise rigidly affixed to the side walls of shell **10'**. A portion **110** of shell **10'** extends forwardly over the first rigid member **106**, and serves to define an inner compartment **112** open at the front end in which the rack **102** is situated when cover G' is in the rearwardly disposed position shown in Figure 7.

The flint wheel C used in the first form of the invention is replaced by the flint wheel assembly **114** shown in Figure 9 and in exploded perspective in Figure 10. Assembly **114** includes a shaft **116** that is held in a fixed position between the side members **76'**. One end of shaft **116** is encircled by a compressed helical spring **118** which bears against a ring-shaped side wall **120** of a pinion **122** that is affixed to one side of a circular plate **124**. Plate **124**, as well as pinion **122**, has a central bore **126** extending therethrough that is defined by a cylindrical surface which rotatably engages shaft **116**. The side of plate **124** opposite that on which the pinion **122** is mounted is provided with a number of circumferentially spaced teeth **128**.

Teeth **128** are so spaced that each tooth will engage one of a number of wedge-shaped cavities **130** formed on the interior surface of a second plate **132**. Plate **132** has a bore **134** formed therein that is coaxially alignable with bore **126** and through which shaft **116** extends. On the side of plate **132** opposite that in which the cavities **130** are formed is provided with an outwardly projecting boss **136** which defines a ring-shaped exterior surface that rotatably engages the inner surface of one of the side wall members **76'**, as best seen in Figure 9. A ring-shaped flange **138** projects from the outer circumferential edge of plate **132**, and this flange is serrated or knurled to cause sparks when in frictional contact with flint D'.

When rack **102** is moved relative to pinion **122** by rearward movement of cover G' relative to container A', the teeth **128** are rotated in such a direction as to drivably engage the cavities **130** and cause rotation of plate **132** as well as the flange **138**. This rotation of the flange causes the emission of sparks due to contact with flint D' whereby wick E' is lighted. However, upon release of pressure from cover G', the spring **94** tends to expand to move the cover forwardly into the position shown in Figure 8. During this movement rack **102** rotates pinion **122**, but the rotation of teeth **128** is then in a direction wherein they merely slide over the depressions **130** without driving the plate **132** or flange **138**.

Thus, as the cover G' returns to the fully extended forward position shown in Figure 7 there is no tendency of the plate **132** or flange **138** to rotate, and the flame F' previously effected by ignition of the fuel in wick E' is extinguished due to lack of oxygen as cover G' assumes the closed position shown in Figure 6. Upon rearward movement of cover G' relative to container A' as above mentioned, the operation is again repeated, with the wick being relighted to provide the flame F'. The handle **32'** is preferably of square transverse cross section and is adapted to removably engage slot **54'** to permit unscrewing of plug **52'**.

Although my invention is fully capable of achieving the results and providing the advantages hereinbefore mentioned, it is to be understood that it is merely the presently preferred embodiments thereof, and that I do not mean to be limited to the details of construction above described other than as defined in the appended claims.

I claim:

1. In a cigarette lighter, the combination of a liquid fuel container defined by a longitudinally extending first shell that is closed on one end by a first end piece and on the opposite end by second and third vertically separated end pieces, which container has a completely enclosed projection extending forwardly from said shell from between said second and third end pieces; longitudinally extending engageable means affixed to said projection; a stop affixed to a forward end portion of said projection; a second shell that serves as a cover which is open at both ends, a forward corner portion of which shell is recessed to receive said stop, with said second shell being longitudinally movable relative to said first shell; a rigid segment affixed to the forward edge portion of said second shell below said projection; engaging means mounted on said second shell that at all times slidably engage said engageable means to movably support said cover on said container; a flint supported on said container forwardly of said second end piece and above said projection; rotatable spark-generating means situated forwardly of said second end piece and above said projection that is in frictional contact with said flint; a wick disposed within the confines of said container, but having an upwardly disposed end portion that extends through an opening in said projection just forwardly of said rotatable means; and first spring means situated within the confines of said second shell and disposed between said third end piece and said segment that at all times tends to maintain said second shell in abutting contact with said stop to conceal said flint, rotatable means and the upper end portion of said wick.

2. A cigarette lighter as defined in claim 1 wherein said first end piece is provided with first and second forwardly extending tapped bosses, a threaded first plug that removably engages said first boss, through which boss when said plug is removed therefrom liquid fuel may be poured into said container, a threaded second plug that removably engages said second boss, a tube disposed in said container and extending from said second boss to an opening in said projection in which said flint is disposed, and a compressed spring in said tube that at all times urges said flint into contact with said rotatable means.

3. A cigarette lighter as defined in claim 1 wherein said stop is of substantially the same transverse cross section as that of said second shell at one end thereof, and said stop appears to be a part of said second shell when it is in abutting contact with said stop.

4. A cigarette lighter as defined in claim 3 wherein said stop has a rearwardly extending rigid member that is adapted to be removably supported on an upper forward surface portion of said projection, and a screw is provided that extends downwardly through an opening formed in said rigid member to engage a tapped bore formed in said upper forward surface portion, with said stop when removed from said projection permitting removal of said cover from said container.

5. A cigarette lighter as defined in claim 4 wherein said container is provided with a raised band on the exterior surface thereof that extends therearound, which band is slidably engaged by the interior surface of said second shell to prevent formation of slide marks on said container as said cover is moved rearwardly and forwardly relative thereto.

6. A cigarette lighter as defined in claim 5 wherein said engageable means comprises at least one rigid guide and said engaging means comprises at least one rigid rail longitudinally affixed to the interior surface of said second shell that slidably engage said gude, with said rigid rail and guide cooperating with said band and interior surface of said second shell to maintain said container and cover in truly aligned longitudinal relationship.

7. A cigarette lighter as defined in claim 6 wherein two parallel, laterally spaced side members are provided that extend upwardly from said projection, which side members serve the dual function of a shield for a flame extending upwardly from said wick and a support for said rotatable means.

8. A cigarette lighter as defined in claim 7 wherein said rotatable spark-generating means comprises a transversely disposed shaft extending between and supported by said side members, a wheel formed with a serrated periphery, and two spacers mounted on opposite sides of said wheel and in abutting contact with said side members to hold said wheel in a centrally disposed position on said shaft.

9. A cigarette lighter as defined in claim 7 wherein said rotatable spark generating means comprises a transversely disposed shaft extending between and supported by said side members; a pinion rotatably mounted on said shaft; a first circular plate affixed to said pinion, which first plate has a centrally disposed bore formed therein through which said shaft extends; a plurality of circumferentially spaced teeth projecting outwardly from said first plate on the side thereof opposite that to which said pinion is affixed; a second plate rotatably supported on said shaft adjacent said first plate and said teeth, said second plate having a plurality of depressions formed therein that are engageable by said teeth, said teeth and said depressions having a ratchet configuration whereby said second plate is driven by said teeth when said teeth are rotated in a first direction only; a flange projecting outwardly from said second plate that has a roughened exterior surface that is at all times

in contact with said flint; rack tooth-defining means mounted on said second shell said rack teeth engaging said pinion to cause rotation of said pinion in said first direction when said cover is moved rearwardly relative to said container; and second spring means that maintain said teeth in contact with said second plate and at all times urge said teeth into engagement with said depressions.

10. A cigarette lighter as defined in claim 9 wherein said rack tooth-defining means comprises a short rigid member that extends downwardly inside the forward upward portion of said second shell said rack extending rearwardly from said member, said rack being vertically spaced from the upper interior surface of said second shell and parallel thereto.

11. A cigarette lighter as defined in claim 10 wherein said second spring means comprises a compressed helical spring that encircles said shaft with one end of said spring bearing against said pinion and the opposite end of said spring bearing against the interior surface of said side member most adjacently positioned relative thereto.

12. A cigarette lighter as defined in claim 10 wherein said first spring means comprises a compressed helical spring, said third end piece has an opening formed therein, and a cup is provided that is affixed to the rear surface of said third end piece in communication with said opening, with one end of said helical spring disposed in said cup and the opposite end of said spring abutting against the rear surface of said segment.

No references cited.