

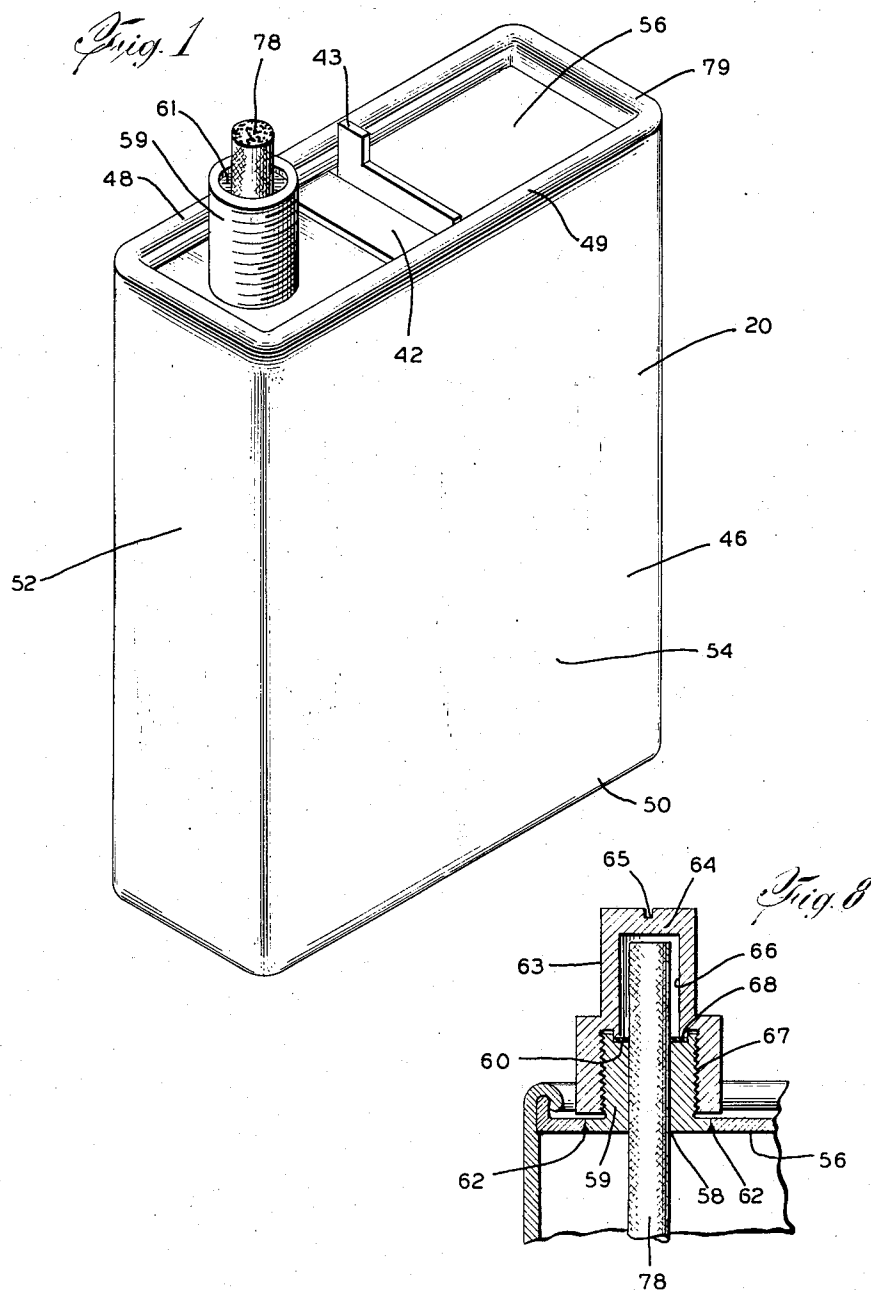
**Oct. 19, 1948.**

J. SIMON ET AL  
CIGARETTE LIGHTER

**2,451,515**

Filed May 23, 1944

3 Sheets-Sheet 1



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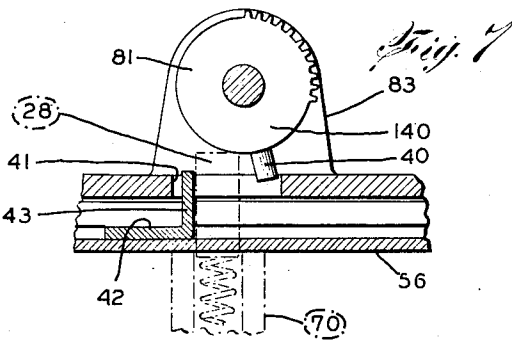
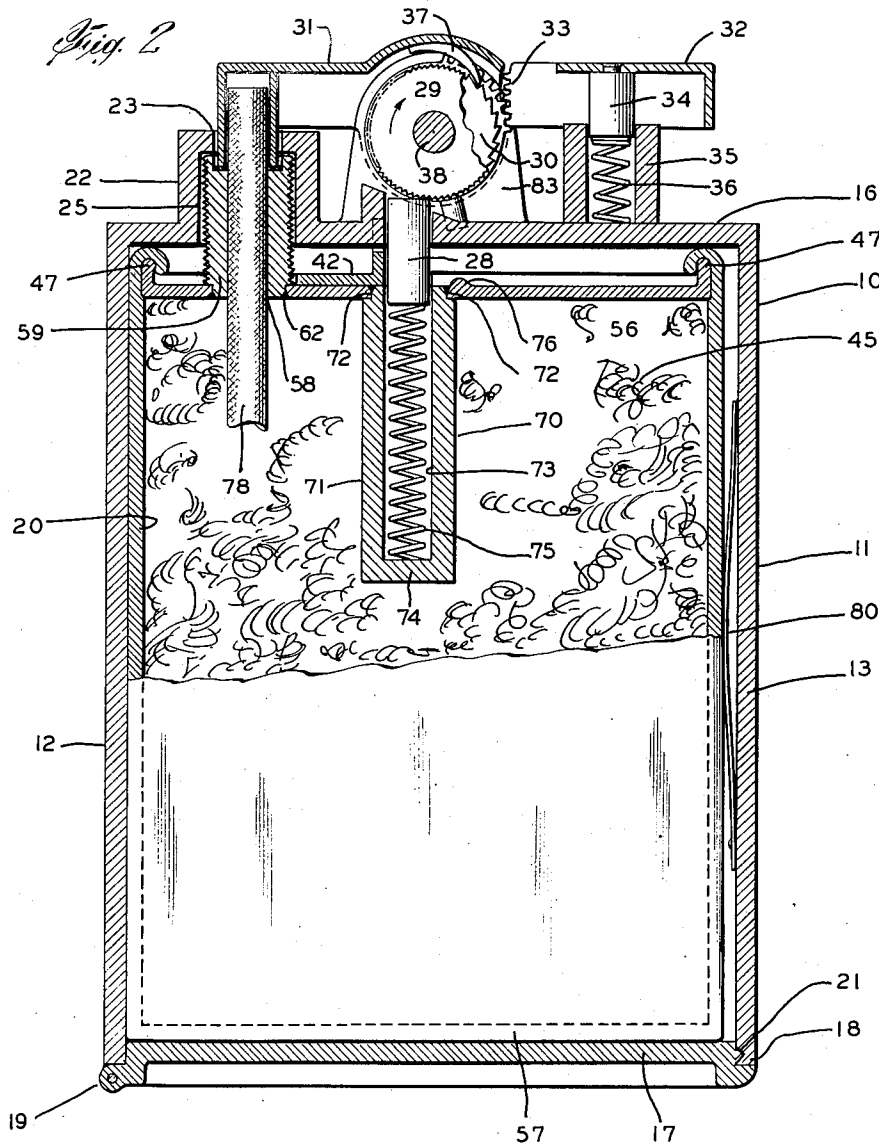
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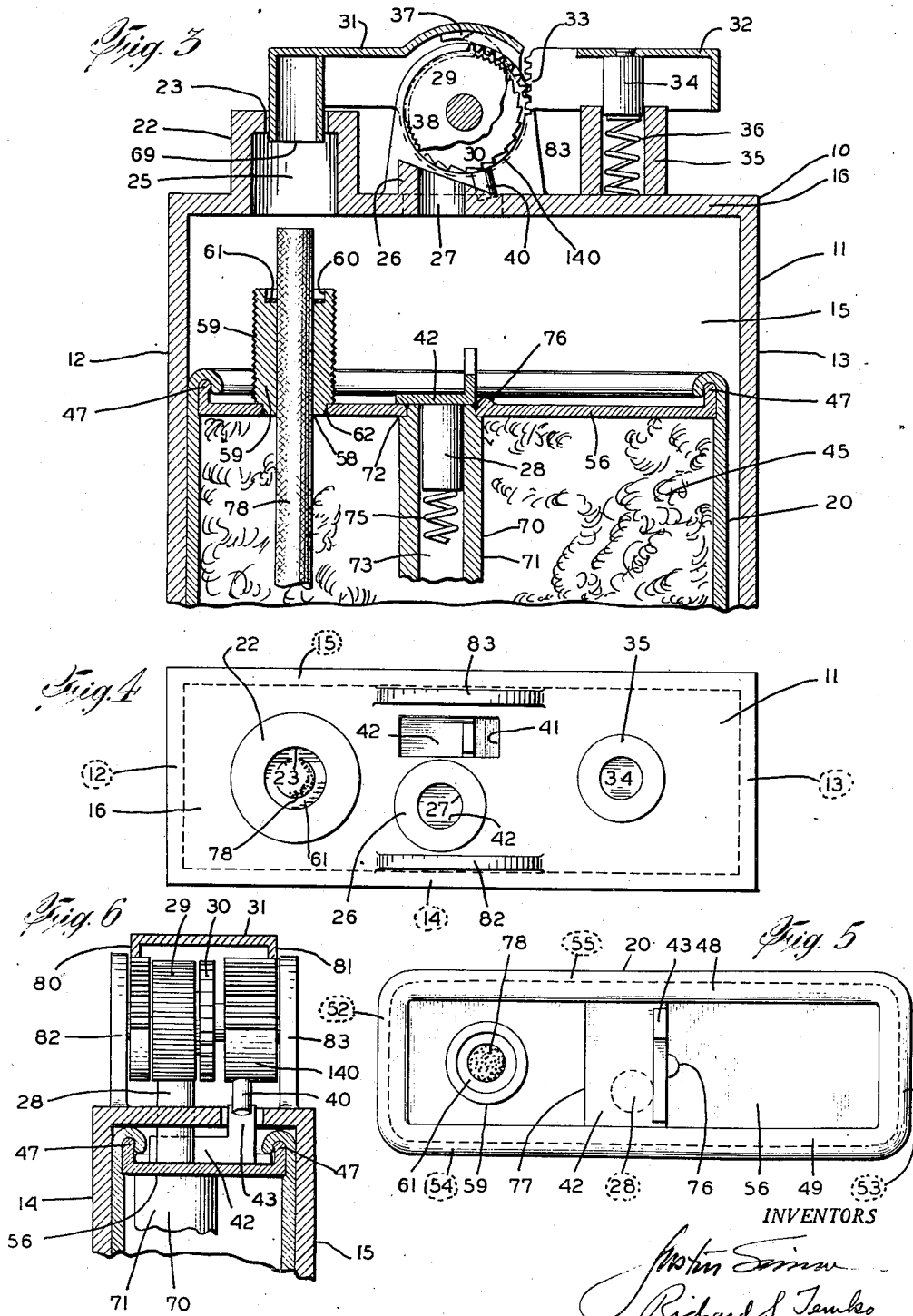
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## UNITED STATES PATENT OFFICE

2,451,515

## CIGARETTE LIGHTER

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This invention relates generally to cigarette lighters and more particularly to a cigarette lighter in which the fuel, flint, and wick are replaced as a unit in the form of a disposable cartridge when these consumable elements have been used up.

In view of prior improvements in the art to which the present invention relates, lighters have become relatively foolproof in operation but are open to the disadvantage that any one of the consumable elements therein, namely, the wick, flint, and fuel may give out at a time when least expected. In accordance with the present invention the consumable elements are correlated so that the fuel becomes entirely consumed at substantially the same time or slightly before the flint is consumed. The wick is so set that the exposed portion thereof is adequate for the entire burning period permitted by the quantity of fuel in the cartridge.

It is, therefore, among the principal objects of the present invention to provide a novel and useful cigarette lighter construction in which when the fuel, flint or wick has been consumed, it is a relatively simple operation to remove a cartridge containing all three of these elements, to discard the same and to replace a new cartridge in the stead of the old one.

Another object herein lies in the provision of the device of the class described, which is substantially leakproof both while being stored prior to use and during use.

Another object herein lies in the provision of a cartridge and cigarette lighter casing construction in which the consumed cartridge may be quickly and conveniently replaced with a new one by a user having no special skill and having no special tools.

These objects and other incidental ends and advantages will more fully appear in the progress of this disclosure.

In the drawings in which similar reference characters designate corresponding parts throughout the several views:

Figure 1 is an isometric view of the cartridge after the cap has been removed and prior to insertion of the same in the lighter casing.

In this view the flint gate is in the closed position thereof.

Figure 2 is an enlarged longitudinal central vertical sectional view, partly in elevation and with some of the parts fragmented, of an embodiment of the invention. In this view the flint gate is open and the lighter is ready for operation.

Figure 3 is a fragmentary sectional view cor-

responding to Figure 2 but showing the cartridge in the course of being inserted into the lighter casing.

Figure 4 is a top plan view of the lighter casing with the operating handle and snuffer mechanism removed for purposes of clarity.

Figure 5 is a top plan view of the cartridge shown in Figure 1.

Figure 6 is a transverse fragmentary vertical sectional view of the structure shown in Figure 2.

Figure 7 is a fragmentary vertical sectional view corresponding to Figure 2, but with the snuffer arm removed and showing the flint gate and operating structure in detail.

Figure 8 is a fragmentary vertical sectional view showing the cartridge neck and cap structure in the closed position thereof.

In accordance with the invention, the cigarette lighter generally indicated by reference character 10, includes a casing 11, having a front wall 12, a rear wall 13, side walls 14 and 15, a top wall 16 and a bottom wall 17. The bottom wall 17 is movably associated with the lower peripheral edge 18 of the body of the casing 11 in any suitable manner, as for example by the hinge structure 19. I have shown the bottom wall 17 as having a snap action 21 to secure the same in a closed position. Obviously other locking means may be used which will permit the detachable connection of at least a portion of the bottom wall for the purpose indicated. Thus the wall 17 forms a movable closure for an entrance in the bottom of the casing 11. This entrance is of such size and configuration as to permit the insertion therethrough of the cartridge generally indicated by reference character 20. While I have shown the bottom wall 17 as being hingedly connected to the body of the casing, where desired other closure means may be used.

The top wall 16 is provided with a receptacle 22 which may have any desired external configuration to conform aesthetically to the external appearance of the lighter casing 11 and has a snuffer element receiving orifice 23. The internal configuration of the receptacle 22 is preferably such as to correspond to the neck 24 of the cartridge 20, as will more fully appear. Thus the receptacle 22 provides the upwardly extending well formed by its internal surfaces. The well is indicated by numeral 25.

The top wall 16 is further provided with a flint support 26 which has a bore 27, the cross-sectional configuration of which conforms to the cross-sectional size of the flint element 28.

Disposed upon and associated with the top wall

16 are a flint wheel 29, ratchet wheel 30, snuffer element 31, operating handle 32 and rack members 33. The handle 32 has a slide member 34 which is adapted for vertical reciprocation in the cylinder 35. The cylinder 35 is affixed to the top wall 16 in any suitable manner. Disposed within the cylinder 35 is an expansive coil spring 36 which urges the handle 32 to its upper position. Suitable detent means are provided to limit the upward movement of the handle 32, as for example the abutment of the upper portion of the rack member 33 with the rear edge of the snuffer element 31 (Figures 2 and 3). The snuffer element 31 is urged in a downward direction, that is to say, in the direction of counter-clockwise rotation as viewed in Figures 2 and 3, by the upward-movement of the racks 33.

The rearmost portion of the ears 80 and 81 are provided with teeth adapted to engage with the racks 33. The last mentioned ears are journaled on the axle 38 inwardly of the upright 82 and 83. Secured to the undersurface of the rear upper portion of the snuffer element 31 is a spring ratchet pawl 37 which is adapted to engage the ratchet wheel 30. The flint gate operating member 40 extends off the extension 140, the latter being secured to the rear end of the ear 81. The operation of this structure is that when the handle 32 is pushed downwardly, it elevates the snuffer element and rotates the flint wheel through the action of the ratchet pawl 37 and the ratchet wheel 30. Release of manual pressure on the handle 32, allows the spring 36 to return the snuffer to its original position, but allows the flint wheel to remain stationary ready for the next movement thereof.

In other words, downward movement of the handle 32 rotates the flint wheel 29 in a clockwise direction as viewed in Figures 2 and 3. The movement of the flint wheel and the ratchet wheel is intermittent and uni-directional, and this movement takes place with each downward movement of the handle 32. Downward movement on the handle 32 simultaneously elevates the snuffer element 31, that is, it rotates the snuffer element in a clockwise direction as viewed in Figures 2 and 3. Release of manual pressure upon the handle 32 permits the spring 36 to return the snuffer element 31 to its normal or closed position.

As best seen in Figure 6, the bi-directional movement of the snuffer element 31 results in a corresponding arcuate movement of the flint gate operating member 40. The top wall 16 is provided with an orifice 41 through which the flint gate operating member 40 may engage the flint gate 42. As seen in Figure 6, the flint gate 42 is provided with an upwardly extending projection 43. It will be obvious, however, that where desired, the member 40 may be extended and the projection 43 shortened or vice versa. It is desirable, however, that the parts be correlated particularly with respect to the amount of rotation given the member 40 by a single complete downward actuation of the handle 32 so that when the handle 32 is in its lowermost position, the member 40 will have been rotated in a clockwise direction a sufficient distance to move the gate 42 to the left as viewed in Figure 7, an amount sufficient to clear the upward travel of the flint element 28 but not to override the flint gate projection 43 so as to carry said gate to the right, as viewed in Figure 7, upon the return travel in a counter-clockwise direction of the member 40. Thus, by virtue of the structure just described, the motion of the snuffer element which is essen-

tially reciprocal in nature, is transmitted to the flint gate 42 to actuate the same only in shifting said flint gate to the relatively open position thereof.

The cartridge 20 is preferably composed of a low cost material, which is impervious to the fuel 45. The cartridge may, therefore, be constructed similarly to the well known "tin can." Thus, it may have a front wall 52, a rear wall 53, side walls 54 and 55, a top wall 56 and a bottom wall 57. The front, rear and side walls 52-55 inclusive, may be composed of a single blank 46, cut from a sheet of thin steel and may be vertically seamed in a well known manner (not shown) such as is used on "tin cans." As seen in Figures 2, 3 and 6, the upper edges of the blank 46 are folded and rolled to engage the outer peripheral edge 47 of the top wall 56. This construction too, is well known in connection with the usual "tin cans" and forms an annular bead, including the bead portions 48 and 49. The bottom wall 57 is connected to the lower edge of the blank 46 in a similar manner, forming a continuous annular bead 50. The sole fluid exit from the cartridge 20 is through the bore 58 in the neck 59, which extends upwardly from the top wall 56. The neck 59 is provided with a central co-axially arranged annular depression 60, which is adapted to receive and retain a ring gasket 61, preferably composed of synthetic rubber, leather or other material, which under compression prevents the passage of fuel. The neck 59 may be a separate die casting or screw machine turning which is suitably integrated with the edge of a corresponding orifice 62 in the top wall 56. One suitable method of integration is the connection of the lower portion of the neck 59 to the edge of the orifice 62 by soldering. Other methods as welding or swaging may be used. Where the top wall 56 is made of suitable material, the neck 59 may be formed by a deforming or extrusion process directly from the material of which the top wall 56 is composed.

As best seen in Figure 8, the outer vertical surface of the neck 59 is provided with means for the detachable engagement therewith of a cap 63. The cap 63 is of generally cup shaped configuration. As shown, the outer surface of the neck 59 and the inner lower surface of the cap 63, are provided with interengageable threads so that the cap 63 may be secured to the neck 59 by rotating the same. The top wall 64 is provided with a slot 65 which may be engaged by a coin or other similar tool to provide a handle for the unscrewing of the cap 63. The cap 63 at the upper portion thereof, has a bore 66 which is of lesser diameter than the lower bore 67 and this provides a shoulder 68 having a depending annular flange which is adapted to engage and compress the gasket 61. In the use of the cartridge, as will appear hereinbelow, the lower edge 69 of the snuffer element 31 is adapted to resiliently engage the resilient gasket 61.

Suspended from the top wall 56 and opening upwardly therethrough, is a flint carrier 70. The carrier 70 is preferably in the form of a housing 71 which may take the shape of an upwardly opening cup. The housing 71 at the upper free edge thereof, is connected to a corresponding opening 72 in the top wall 56. The parts may be integrated thereat in any well known manner, as for example by soldering, welding or swaging. It is important that this juncture be hermetic in order to avoid leakage of contents or vapors from the inside of the cartridge 20. The housing 71 is preferably provided with a longitudinally extend-

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ing bore 73, the cross-sectional shape and size of which, correspond to the cross-sectional size and shape of the flint element 28. The housing 71 has a closed bottom wall 74 which serves as a support for the lower end of an expansive spring 75 which forces the flint element 28 upwardly.

The flint gate 42 previously mentioned, is slidably disposed above the exit of the bore 73 and is shown in the closed position thereof in Figure 3 and the open position thereof in Figure 2. The undersurface of the flint gate 42 slidably contacts the upper surface of the top wall 56 and at the edges thereof is disposed between the upper surface of the top wall and the lowermost edges of the bead portions 48 and 49, which act to form channeled guides therefor. Movement of the gate 42 to the right, as viewed in Figures 2 and 3, is limited by the detent 76 and movement thereof to the left, as viewed in said figures, is limited by the edge 77 abutting against the neck 59.

By way of example, one manner of assembling the device is here given. The blank 20 is integrated with the bottom wall 57 to form an open topped can which is loaded with the proper amount of fuel. As is known in the art, where desired, the fuel may have absorbent cotton or similar material therein. The neck 59 and the carrier 70 are integrated with the top wall 56. The wick 78 is inserted into the neck 59. Following this, the gate 42 is placed upon the top wall in a position generally corresponding to that shown in Figure 1 and the edge 47 thereof has the upper edge of the blank 42 crimped or beaded thereover as is well known in the "tin can" art. The bead so formed prevents vertical upward movement of the flint gate. Next, the spring 75 and the flint 28 are loaded into the carrier 70 and the gate is moved into the closed position thereof where it is frictionally retained by the pressure of the top of the flint against the undersurface thereof. The cap 63 may be placed upon the neck 59 or the same may have been placed thereupon at the time the neck 59 was connected to the top wall 56. The foregoing steps produce the completed cartridge ready for use.

In order to load the lighter 10, the casing is opened by swinging the bottom wall 17 and after removal of the cap 63, the cartridge 20 is pushed into the casing 11 until the uppermost surface of the top rim 79 abuts against the undersurface of the top wall 16. The position of the neck 59 and of the exit from the bore 73 as well as the projection 43 are all gauged in position from the outer surface of the front wall 52 and in order that the parts may properly align themselves, the inner surface of the rear wall 13 may be provided with a spring 80 adapted to force the front wall 52 into contact with the inner surface of the front wall 12. Where desired to provide for variations in the effective length of the cartridge 20, the upper surface of the bottom wall 17 may be provided with resilient means (not shown) corresponding to the spring 80, which are adapted to urge the uppermost surface of the rim 79 against the lower surface of the top wall 16. With the bottom wall closed, the first manual depression of the handle 32 will move the flint gate operating member 40 forwardly and will shift the gate so that it no longer obstructs upward movement of the flint element 28 which will rise to meet the serrated surface of the flint wheel 29. The flint itself now acts to prevent rearward movement of the gate 42. The flint is supported adjacent the wheel 29 by the flint support 26. Subsequent manipulations of the handle 32 will result in movement of

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the flint wheel to cause sparks which will ignite the fuel in the wick 78 at the same time that the snuffer element has been lifted out of the way. Release of the handle 32 allows the snuffer to return to its closed position so that the lower edge 60 thereof engages the gasket 61 in the neck 59.

After the flint, wick or fuel have been consumed, the entire cartridge may be discarded and a new one replaced in an easy and convenient manner.

It may thus be seen that we have provided a novel and useful cigarette lighter construction which is extremely convenient in use and efficient and foolproof in operation. The cartridge may be replaced with a single quick operation which is as convenient as replacing the dry cells in an ordinary flashlight.

We wish it to be understood that we do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

We claim:

1. Cigarette lighter construction comprising: a casing; a cartridge, said cartridge being adapted to contain fuel and having a flint carrier associated therewith; a flint disposed within said carrier; a gate movably associated with the cartridge and the carrier and adapted in the open position thereof, to allow the flint to move upwardly of said carrier and in the closed position thereof to obstruct movement of the flint upwardly of the carrier and means associated with the casing and adapted to actuate said gate.

2. As a new article of manufacture, a cigarette lighter fuel containing cartridge comprising: a casing; a flint carrier on said casing; a flint in said carrier; and a flint gate movably associated with said flint carrier and in contact with said flint, said flint gate being adapted in the open position thereof to allow said flint to pass outwardly from said carrier and in the closed position thereof to engage said flint to restrict outward movement of the flint.

3. As a new article of manufacture, for use with a cigarette lighter having a striking device, a fuel container cartridge comprising: a casing; a flint carrier on said casing; a flint in said carrier; and a flint gate movably mounted on said casing and positioned lying between said flint and said striking device when the cartridge is in the cigarette lighter, said flint gate being adapted in the open position thereof to allow said flint to pass outwardly from said carrier and in a closed position thereof to lie between the flint and the striking device.

4. Cigarette lighter construction comprising: a casing; flint striking means in a predetermined position on said casing; a cartridge adapted to contain fuel, said cartridge having a flint and a carrier therefor; said cartridge being detachably engageable with said casing; and said flint carrier being positioned on the cartridge in juxtaposition to said striking means; whereby when the cartridge is engaged by the casing, the flint striking mechanism may act upon said flint.

5. Cigarette lighter construction comprising: a casing; movable flint striking means on said casing; a cartridge, for containing fuel, having a flint and a carrier therefor; means in the carrier for urging the flint out of the carrier; and a movable gate on said cartridge which in a first position obstructs the movement of the flint out of the carrier, and in a second position is displaced with respect to said carrier; said cartridge being engageable with said casing; said flint striking

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means engaging said gate in the first position thereof to shift the same toward said second position.

6. Cigarette lighter construction comprising: a cigarette lighter body; movable flint striking means on said body, said means being located in a predetermined position on said body; a cartridge engaged by said body and adapted to contain fuel; a flint carried by said cartridge in juxtaposition to said striking means; movable gate means for said flint adapted in a closed position thereof to lie between the flint and the striking means and in an open position thereof to expose said flint to the action of the striking means; said striking means including a member engageable with said gate means to shift said gate means towards its open position.

7. Cigarette lighter comprising: a fuel carrying cartridge having a carrier and pyrophoric material in said carrier; a lighter casing adapted to contain said cartridge and having a flint striking mechanism thereon fixedly positioned with respect to said casing; said cartridge being engage-

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able and disengageable with said casing, said pyrophoric material being positioned to be acted upon by said flint striking mechanism when said cartridge is engaged with said casing.

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