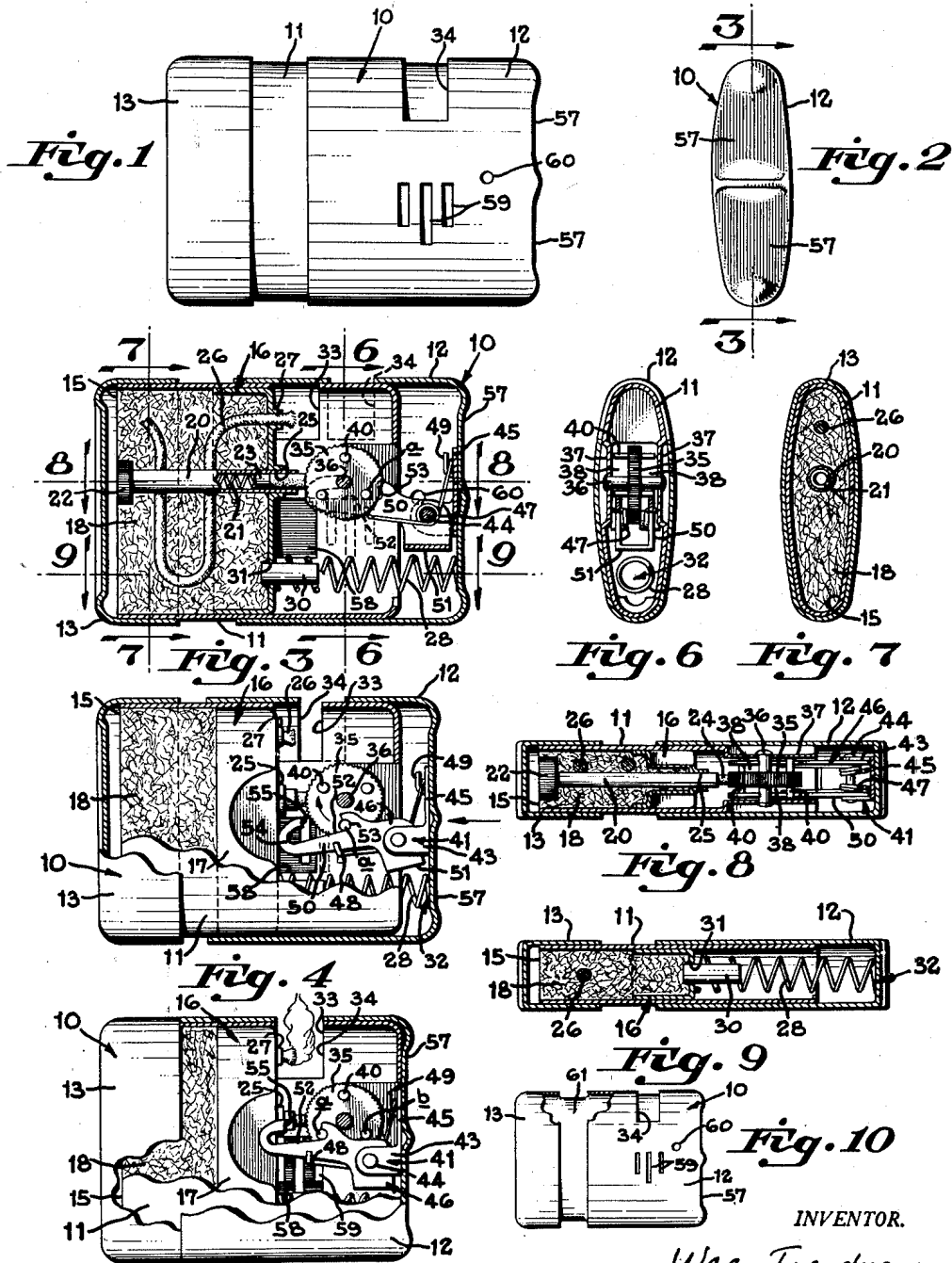


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CIGARETTE LIGHTER

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CIGARETTE LIGHTER

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This invention relates to cigarette lighters and is more particularly concerned with a new type of construction which combines certain of the advantageous features of other lighters with additional features peculiar to this invention.

Each of the conventional types of cigarette lighters now in use has certain distinctive and advantageous features and likewise certain objections. To illustrate, lighters which are actuated by trigger depression are probably the easiest to use since there is no rubbing on the fingertip as in the case of the wheel actuated lighters, but these do not ordinarily include wind protective features. Other types of lighters include wind protective features, usually in combination with some type of wheel actuation which is objectionable to some users. Another lighter construction requires the opening of a hinged protective casing before the wheel can be actuated and this complicates the lighting operation, particularly where it is desired to operate the lighter with one hand. Other lighters of the so-called automatic type are simple to operate and in some instances include windproof features, but their construction requires mechanisms which are relatively complicated and which substantially increase the cost of manufacture.

The principal object of the present invention has been to provide a lighter which includes, in one construction, the majority of the advantageous features of other lighters without an undue increase in complication of parts or in cost of manufacture.

Specifically, one of the objects has been to provide a lighter in which there is no exposed wheel and no trigger of the conventional type, the light being obtained by a simple endwise compression of the lighter between the fingers and the palm of one hand.

Another object has been to provide a lighter in which the light is protected from the wind by the expedient of recessing the wick within the interior of the casing rather than by providing an exposed wick guard, as in most of the conventional types.

Another object has been to provide a lighter in which there is an air port below the wick instead of around it, thereby effecting a chimney type of construction which stimulates combustion and flame stability.

Another object has been to provide a lighter which has no exposed operative parts of any kind and one in which it is not necessary to remove or elevate on hinges any part in order to effect a light.

Another object has been to provide a lighter in which the various advantages are attained through a minimum of operating parts and with great ease of fabrication and assembly.

Other and further objects and advantages will be apparent from the further and more detailed

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description of the preferred embodiment of the invention which is illustrated in the drawings in which:

Figure 1 is a side elevational view of the lighter in operative position.

Figure 2 is an end view from the right hand end of the structure shown in Figure 1, particularly illustrating the finger-grip configuration of this end.

Figure 3 is a cross sectional view taken on line 3-3, Figure 2, and illustrates generally the arrangement of the operative parts within the interior of the lighter casing.

Figure 4 is a view similar to Figure 3 except that in this instance, the lighter casing has been partially compressed preparatory to striking a spark to light the wick.

Figure 5 is a view similar to Figures 3 and 4 showing the lighter in fully compressed position with the wick lighted.

Figure 6 is a sectional view along the line 6-6, Figure 3.

Figure 7 is a sectional view along the line 7-7, Figure 3.

Figure 8 is a sectional view along the line 8-8, Figure 3.

Figure 9 is a sectional view along the line 9-9, Figure 3.

Figure 10 shows a modified form of the lighter.

In the preferred embodiment of the invention, which is illustrated in the drawings and designated generally as 10, it will be noted that there are essentially three principal elements; the container jacket 11, the sliding cover or sleeve 12, and the cap 13. The sliding cover and the cap are telescopically positioned around the container jacket as best illustrated in Figures 3-5. These elements are in the shape of a long flat oval, in cross-section, to fit the hand.

The container jacket includes a generally open-ended sleeve 15 and is divided into two compartments by a partition member 16. A continuous peripheral flange 17 on the partition which may be soldered or brazed to the jacket, provides a liquid-tight seal between compartments. The compartment 18 shown on the left in Figures 3-5 defines the fuel chamber which is substantially filled with cotton or similar material. The flint tube 20 extends completely through the fuel chamber and contains a conventional flint spring 21, and has a cap screw 22 threaded into its outer end. A flint support 23 is carried by the inner end of the spring 21 and engages a conventional cylindrical flint 24. The inner end of the flint tube 20 is secured to the partition and projects through a rimmed aperture 25 therein with the flint extending from the end of the tube. Also disposed in the fuel chamber is a wick 26 which projects through a rimmed aperture 27 in the partition 16 at a point somewhat above the flint 24 in the normal position of the lighter, which is

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illustrated in the drawings. An expansion spring 28 is seated on a spring guide plug 30 which is secured in a third aperture 31 in the partition wall 16 below the flint tube. This expansion spring rests at its other end on the inner wall of the sliding cover 12, at point 32, and performs the function of extending the sliding cover 12 from the contracted position shown in Figure 5 to the expanded position shown in Figure 1.

Within the container jacket and at the right side of the partition wall 16, as shown in Figures 3-5, a port 33 is provided in the upper wall of the jacket 11. This port is adapted to coincide with a port 34 in the upper surface of the sliding cover 12 when the lighter is in contracted position, as shown in Figure 5, to permit access to the lighted wick. It will be noted that when the lighter is in the expanded position, these two ports are out of alignment and there are no exposed openings of any kind. More or less centrally of the compartment within the container jacket 11 on the right side of the partition wall, a toothed flint wheel 35 is carried by a shaft 36. In this area the walls of the jacket 11 are formed in and narrowed as at 37 and the ends of the shaft 36 journalled therein. The ends of the shaft 36 may be burred over on the outer faces of the walls to retain the wheel in a position centrally between the walls of the jacket. Referring to Figure 8, it will be noted that spaces 38-38 are provided between the walls and both sides of the flint wheel. Stud elements 40, preferably three in number, are set in the flint wheel 35. These studs extend outwardly from both sides of the wheel and are spaced equally, annularly around the wheel, the studs being of such a length to just clear the walls 37 of the jacket. A trip yoke indicated generally at 41 is secured to the inner face of the end wall of the slidable cover. The trip yoke includes a pair of arms 43, which journal a stub shaft 44, and a foot portion 45 fastened to the wall of the cover. A trigger 46 and a trip spring 47 are journalled on the stub shaft with the one end 48 of the trip spring engaged under the trigger and the other end hooked over a detent 49 struck from the foot portion 45 of the trip yoke. The spring tends to swing the free end of the trigger up. The trigger includes a pair of parallel arms 50 which are joined by a web 51 extending between the arms under the journal of the trigger. These arms extend into the spaces 38-38 and straddle the flint wheel 35. A longitudinal slot, open along the upper side, is stamped in each of the arms. The open slot provides a straight-edge 52, a seat 53, and a hooked finger 54. The seat 53 is adapted to engage over one of the studs for actuating the flint wheel to strike a spark. The end of the hooked finger 54 is cut out to provide an arcuate rest 55 that is adapted to abut on the shaft 36 when the lighter is not in operation as shown in Figure 3. When in this position the straight-edge 52 of the trigger rests against two of the studs 40 and the hooked finger 54 is in a position in which the rest 55 will abut the shaft 36. Thus, it will be seen that the hooked finger serves as a limiting stop for the slidable cover 12 and holds the cover in position against the action of spring 28.

Other elements of the sliding cover 12 which should be noted are the finger-hold indentations 57 provided at the ends of the element, the draft ports 58 in the sides of the jacket, the draft slots 59 in the sides of the sliding cover, and the apertures 60 also in the sides of the sliding cover which provide a function in the repair of the device as will be subsequently described. The cap

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13 is simply a closure element for the fuel chamber and performs no other function in the operation of the device.

Considering now the method of operation, the flame is obtained simply by the gripping or squeezing action required in moving the sliding cover 12 from the position shown in Figure 1 to the position shown in Figure 5, Figure 4 representing an intermediate step in the operation.

Figure 3 shows the sliding cover 12 in fully extended position. At this point, the hooked fingers 54 of the two arms of the trigger are resting against the shaft 36 at the sides of the flint wheel 35. It will be noted in Figure 3 that the axes of the shaft 36, the stud marked *a*, and the stub shaft 44 are out of line only slightly. Thus, when the lighter is squeezed, there is more resistance to overcome right at the start of the squeezing motion than in the latter portions of the travel and a snap action results. As the sliding cover is moved inwardly, the seat 53 engages the stud *a* and revolves the flint wheel through the position shown in Figure 4, to that shown in Figure 5. During this operation, the flint wheel has been indexed exactly $\frac{1}{3}$ of a revolution, and the studs after the operation, bear the same general relationship to the trigger that they did before the wheel was revolved. Now as the cover is released and the spring 28 pushes the cover to the extended position, the arms of the trigger retract to the position shown in Figure 3 in which the lighter is again ready for a second operation. It will be noted that during this operation, the entire trigger is urged upwardly toward the flint wheel by the trip spring 47. The inward movement of the cover 12 is stopped by the engagement of the stub *b* on top of trigger 46, the stub *b* being the next one removed from *a* in the counterclockwise direction as shown in Figure 5.

In the compressed position shown in Figure 5 the flame is protected by the walls of the container jacket 11 so that a very effective wind guard is provided. At this point, the port 33 in the upper wall of the container jacket (which preferably extends as shown to a point below the wick) is in line with the port 34 in the sliding cover and the ports 58 in the jacket are similarly in line with the draft slots 59 in the cover so that a draft is provided through the aligned ports 58 and slots 59 and against the lighted wick on its under side, thus constituting a chimney effect which provides a strong and steady flame and increases the combustion generally.

It will be noted that the trigger 50 performs a double function of rotating the flint wheel 35 and maintaining the sliding cover 12 in position on the container jacket 11. If, for any reason, any part of the mechanism needs cleaning or repair, the recommended procedure is to compress the cover slightly to clear the hooked finger 54 over the stud just below it, to insert a wire or similar instrumentality through the aperture 60 in the side of the slidable cover 12, and to depress the trigger against the action of spring 47 to disengage it from the flint wheel 35. With the trigger thus disengaged from the flint wheel, the cover may be removed from the jacket. Reassembling the device would be accomplished in the same manner, that is, by the use of a wire the trigger may be depressed slightly and then the cover slid over the jacket, the trigger engaging over the flint wheel automatically.

It will be apparent from the above that I have provided a lighter which is of comparatively simple construction, but one which possesses a num-

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ber of determined advantages over other constructions, particularly in the ease of lighting and the type of flame provided. Another distinct advantage of the present invention can be seen from a comparison of Figures 3 and 5. In Figure 3, the seats 53 of the trigger 46 are spaced from the studs 40 on the flint wheel 35. The travel afforded by this spacing, plus the travel of the sliding sleeve 12 as the lighter is being compressed, results in a pump action which serves to expel saturated vapor from the inside of the casing. The rush of vapor from the ports creates turbulence in the casing, thus, intermixing vapor and air to provide a combustible mixture at the wick. It is characteristic of a wind-proof type lighter having a cage or a perforated wall protecting the wick that the area around the wick becomes saturated after filling and impossible to light unless the operator blows into the cage. The pump action of the present lighter automatically dispels the saturated condition around the wick.

Another feature of the present invention is illustrated in Figure 10 which shows a slightly modified form of the container jacket. In this modification, the space between the cap and sleeve which would normally expose the surface of the jacket is reduced in cross-section slightly to provide a recessed band 61 around the lighter. Thus, when the lighter is compressed to strike a light, the band 61 is not subject to scratching or marring from the sleeve 12 as it slides over this area. The band may be painted, plated or treated in some other manner in this area to provide contrast between the band and the body of the lighter. The band would, therefore, provide a background for printing or etching for advertising material or for identifying the owner of the lighter.

The particular structure disclosed represents only the preferred embodiment of the invention and obviously various departures may be made therefrom in materials, details of construction and the like without departing from the basic concepts of the invention as described in the ensuing claims.

Having fully described my invention, I claim:

1. A cigarette lighter comprising; a jacket, a partition in the jacket, said partition defining a fuel chamber in one end of the jacket, a sleeve slidably mounted on the jacket, an end wall in said sleeve enclosing the end of the jacket opposite the fuel chamber, an expansion spring having one end seated on the partition and the other end seated on the end wall of the sleeve and tending to extend the sleeve with respect to the partition, a flint wheel rotatably journaled in the jacket between the partition and the end wall, a flint supported by the partition and in spring-urged engagement with the flint wheel, a wick in said fuel chamber and having an end projecting through an aperture in the partition in a position to receive sparks arising from rotation of the flint wheel on the flint, studs extending from a side face of the flint wheel, a trigger pivotally mounted on the end wall of the sleeve and adapted to move therewith, said trigger being adapted to engage one of the studs for rotating the flint wheel when the sleeve is moved toward the partition, and means carried by said trigger adapted to cooperate with a stop associated with the flint wheel for limiting the outward movement of the sleeve with respect to the jacket, said means being disengageable to permit re-

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moval of the sleeve from the jacket for repair and cleaning purposes.

2. A cigarette lighter comprising; a jacket, a partition in the jacket, said partition defining a fuel chamber in one end of the jacket, a sleeve slidably mounted on the jacket, an end wall in said sleeve enclosing the end of the jacket opposite the fuel chamber, an expansion spring having one end seated on the partition and the other end seated on the end wall of the sleeve and tending to extend the sleeve with respect to the partition, a rotatable flint wheel mounted on a shaft journaled in the jacket between the partition and the end wall, a flint supported by the partition and in spring-urged engagement with the flint wheel, a wick in said fuel chamber and having an end projecting through an aperture in the partition in a position to receive sparks arising from rotation of the flint wheel on the flint, studs extending from a side face of the flint wheel, a trigger pivotally mounted on the end wall of the sleeve and adapted to move therewith, said trigger being adapted to engage one of the studs for rotating the flint wheel when the sleeve is moved toward the partition, and a stop finger on the trigger adapted to engage the flint wheel shaft when the sleeve is in the extended position for limiting the outward movement of the sleeve under the action of the expansion spring.

3. In a cigarette lighter, including a jacket supporting a wick and a flint positioned adjacent the wick, with a slidable sleeve superimposed on the jacket and a spring adapted to urge the sleeve to an extended position with respect to the jacket; a rotatable flint wheel positioned contiguous to the flint, said wheel being mounted on a shaft and having three studs symmetrically positioned with respect to the shaft extending from a face thereof, a trigger pivotally mounted on the sleeve, said trigger having a seat thereon for engagement with one of the studs for rotating the flint wheel upon movement of the sleeve inwardly relative to the jacket against the action of the spring, said trigger being adapted to be engaged by the stud on the flint wheel next removed from the first mentioned stud in the direction counter to the rotative movement of the flint wheel after one-third of a revolution of the flint wheel, whereby the inward movement of the sleeve is stopped, and means on said trigger adapted to cooperate with a stop associated with the flint wheel for limiting the outward movement of the sleeve relative to the jacket, said means being disengageable to permit removal of the sleeve from the jacket for repair and cleaning purposes.

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