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I. FLORMAN

2,361,759

CIGARETTE LIGHTER

Filed Dec. 23, 1942

FIG. 1.

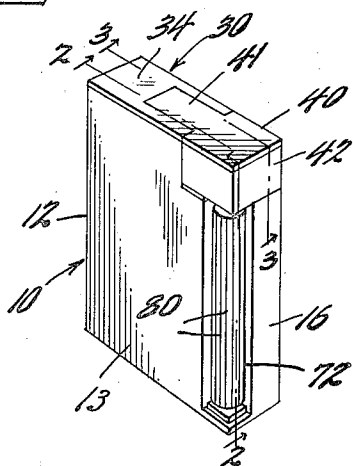


FIG. 2.

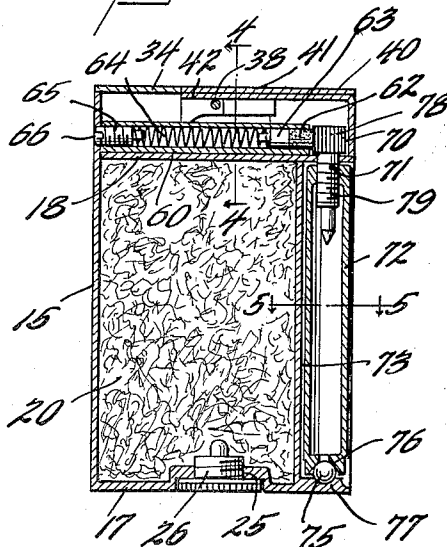


FIG. 3.

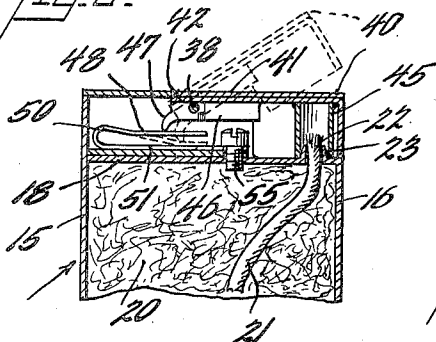


FIG. 4.

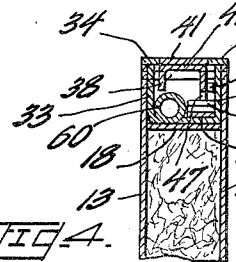


FIG. 5.

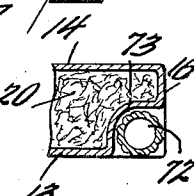


FIG. 6.

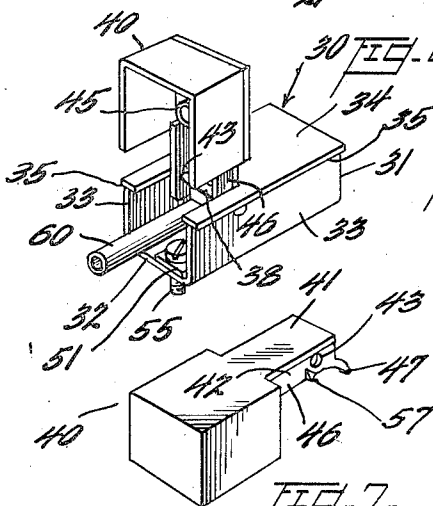
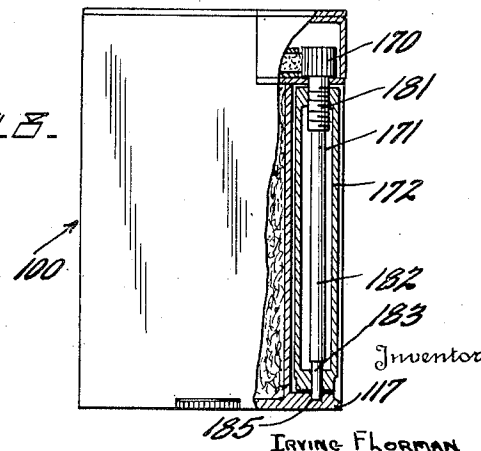


FIG. 7.

FIG. 8.



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## UNITED STATES PATENT OFFICE

2,361,759

## CIGARETTE LIGHTER

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3 Claims. (Cl. 67-7.1)

This invention relates to lighting devices and more particularly to pocket cigarette lighters of the type which are manually actuated to produce a spark which in turn ignites a wick to provide a flame from which the cigarette or other article may be lighted.

The general object of the invention is to provide a novel and improved lighter of the class described which is of sturdy and compact construction, easy to manufacture and assemble, and adapted to function efficiently and regularly with a minimum expenditure of time or effort.

A more particular object of the invention is the provision of novel actuating means for the lighter adapted to be operated by the thumb of the user while the lighter is held in a natural and easy position in the hand.

Another object of the invention is to provide a novel construction in a lighter of this type whereby the several parts may be more readily assembled and secured and whereby the cover or cap of the lighter may be more effectively operated. Practically all of the parts subject to wear are readily demountable and may be replaced by other interchangeable parts by the user without mechanical knowledge or the use of special tools.

In its preferred form the invention contemplates the provision of a flat lighter of the general configuration of a rectangular parallelepiped, the greater part thereof comprising a reservoir for liquid fuel, from which a wick protrudes. Within the rectangular outlines of the lighter and above the reservoir portion, a unitary assembly is secured, this assembly comprising means for resiliently projecting a flint toward the flint wheel, a hinged cover or lid embodying a snuffer device, and means for resiliently biasing said cover toward open and closed position and for limiting its movement in the opening direction. Novel and economical means are provided for securing this assembly to the casing.

The preferred forms of the invention are also characterized by the provision of a novel actuating cylinder or roller for operation by the thumb of the user, this roller being properly corrugated or knurled to provide sufficient frictional contact with the thumb, and of a length such that it extends substantially the full length of the lighter casing. The roller is set in a recess formed in a corner or edge of the lighter at the intersection of two adjacent ones of its longer sides and is in a position to be easily contacted and actuated by a user gripping the lighter in a wide variety of ways. The present ar-

5 rangement also affords an increased area of contact, the elongated roller capable of being pressed by substantially the whole length of the first joint of the thumb. Effective demountable bearing means are provided for the roller which may be removed from the assembly without difficulty for replacement or repair.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawing in which certain embodiments of the invention are illustrated by way of example.

In the drawing,

Figure 1 is a perspective view of a lighter embodying the principles of the invention, the cover or lid of the lighter being in closed position;

Figure 2 is a view in vertical section of the lighter taken on line 2-2 of Figure 1;

Figure 3 is a fragmentary view showing the upper portion of the lighter in vertical section, as taken substantially on line 3-3 of Figure 1, and also showing the lid or cap in half-open position in broken lines;

Figure 4 is a view in transverse vertical section of a portion of the lighter substantially as taken on line 4-4 of Figure 2;

Figure 5 is a fragmentary view in horizontal section of a portion of the device taken on line 5-5 of Figure 2;

Figure 6 is a view in perspective of the unitary top assembly of the lighter showing the cover or cap in open position;

Figure 7 is a perspective view of the lid or cover member of the lighter; and

Figure 8 is a view in side elevation of a modified form of lighter under the present invention, with parts broken away to illustrate the mounting of the actuating cylinder or roller.

The lighter illustrated in Figures 1-7 of the drawing is indicated generally by the reference numeral 10 and comprises a main body or casing portion 12 having parallel side walls 13 and 14, parallel end walls 15 and 16, a bottom wall 17, and a top wall 18. This casing is of liquid-tight construction and provides a reservoir for the combustible liquid used as fuel for the lighter. The interior of the casing or reservoir is preferably filled with wadding of raw cotton or other suitable material, as indicated at 20 in the drawing. A wick 21 of conventional construction and material is disposed within the reservoir and one of its ends 22 projects through an opening in the top wall 18 which may be surrounded by the hollow boss or nipple member 23. A recessed filling opening 25 is provided in the bottom wall 17

of the casing and is closed by a threaded and knurled cap or closure 26 which may be of conventional construction.

The end wall 15 and rather more than half of each of the two side walls 13 and 14 adjacent this end wall are extended vertically above the top wall 18 of the casing to provide a substantially rectangular recess which is adapted to receive the unitary operating assembly of the character referred to, which is illustrated as a whole in Figure 6 of the drawing.

The top assembly which carries much of the operating mechanism is indicated generally by the reference numeral 30 and comprises a substantially rectangular box-like housing or supporting frame 31 which includes the bottom plate 32, the side walls 33, and the top plate 34 which forms part of the top surface of the completed lighter. The side and rear edges of the top plate 34 may be provided with overhanging flanges 35 which will surmount the upper edges of the extended side and end walls which enclose the assembly.

Adjacent the upper edges of the side walls 33 of the unitary assembly frame there are provided openings forming bearings for the pintle 38 which serves as a hinge element for the box-like lid, cap, or cover 40 of the lighter. This cap 40 has a rearward extension or shank 41 which is reinforced by an inverted channel member 42 whose downturned flanges are provided with openings 43 to receive the pintle 38. The channel member 42 may also be extended into the main portion of the cap to reinforce it and also to provide means for supporting the cylindrical snuffer hood 45 which is disposed so as to cover the projecting end of the wick in order to extinguish the flame, as clearly shown in Figure 3 of the drawing.

One of the flanges 46 of the channel member 42 is provided with a tongue 47 projecting rearwardly and downwardly therefrom and in constant contact with one arm 48 of a U-shaped or return bent leaf spring 50 whose other parallel arm 51 is disposed upon the lower plate 32 of the frame 31 of the assembly. The arm 51 is longer than the arm 48 and is provided with an opening registering with similar openings in both the plate 32 and the top wall 18 of the casing, the last named opening being screw threaded for the reception of a screw 55 which serves the dual purpose of securing the leaf spring in position and attaching the entire top assembly to the body portion or casing 12. It will be readily understood from an inspection of Figures 2, 3 and 6 of the drawing how the spring 50 will, through contact with the tongue 47, resiliently bias the cap 40 to and from open and closed position.

The rectangular box-like cap member 40 completes the generally squared contour of the upper end of the lighter when it is in closed position and it is of course limited in moving to this position by contact with the top wall 18 of the lighter adjacent the wick end. The opening movement of the cap 40 is limited to the position shown in Figure 6 by means of the spur 57 which is struck from a part of the flange 46 of the member 42 and which is adapted to strike the underside of the top plate 34 of the assembly just above the pintle 38.

The top assembly 30 also serves to contain and support the flint and the flint projecting means. For this purpose, a tube 60 is secured, by welding or otherwise, to the upper side of the bottom plate 32 of the assembly. Within the forward

end of this tube there is disposed a cylindrical pyrophoric flint 62 which is backed up by a plug 63 which is maintained in a forward position by means of the coil spring 64. The spring is compressed between the plug 63 and a rearwardly disposed plug 65 which is threaded into the rear end of the tube 60. The plug 65 is preferably kerfed as at 66 for the application of a screw driver or other tool. It will be noted that an opening is provided in the upward extension of the end wall 15 for the introduction and removal of the plug 65, the flint 62, and the other elements of the flint projecting means. When the device is assembled, the flint 62 is of course disposed adjacent the wick end 22 so that sparks struck from the flint will fall upon the wick.

An abrasive flint wheel 70 is carried upon the end of a pin or rod 71 which is threaded into the upper end of a cylinder or roller 72 which comprises the operating element of the lighter. The cylinder or roller 72 is disposed within an arcuate recess or alcove 73 formed in the corner of the lighter at the intersection of the end wall 16 and the side wall 13. The bottom wall 17 is extended across this alcove to complete the full rectangular contour of the lighter and the top wall 18 is similarly extended above the roller 72. The pin 71 passes through an opening in the top wall 16 and provides an upper pintle or trunnion for the operating roller 72. The bearing means at the bottom of the roller however is comprised by a ball element 75 which is received in semi-spherical recesses 76 and 77 formed respectively in the end of the roller 72 and in the extension of the bottom wall 17.

The resilient projecting means continually urges the flint 62 against the flint wheel 70 and the teeth or corrugations 78 on the wheel 70 are preferably adapted to rotate in contact with the flint in one direction only, that is in a direction to throw sparks from the flint onto the wick end 22.

The screw threads 79 on the pin 71 and the corresponding threads of the roller 72 are left-hand threads so that upon frictionally or otherwise retaining the wheel 70 against rotation, a reverse rotation of the actuating roller 72 will unscrew the pin 71 and raise the wheel 70 upwardly beyond the flint until the wheel and pin member may be withdrawn from the roller. Thereupon the roller may be taken out of the recess 73 by pivoting it outwardly from the casing upon the ball 75 as a center.

Thus, the flint wheel member and the roller may be readily removed for repair or replacement without the use of any special tools. It will be noted that in the normal use of the device the direction of rotation of the roller will be such that the pin 71 carrying the flint wheel 70 will tend to be more firmly secured within the end of the operating roller. The roller 72 is preferably provided with longitudinal corrugations 80 to provide effective frictional contact between the roller and thumb or finger of the user.

In Figure 8 of the drawing a modified form of lighter is indicated generally by the reference numeral 100. This lighter is of the same general configuration as the one earlier described, the only difference being in the mounting of the operating roller 172 which actuates the flint wheel 170. In this embodiment the wheel supporting pin 171 has a portion 181 which is threaded into the end of the roller 172 and has an elongated shank 182 which extends throughout the length of the roller and is provided with a trunnion por-

tion 183 passing through an opening in the lower end of the roller and having its end seated within a thrust bearing recess 185 in the extended portion of the bottom wall 117 of the lighter casing. The pin or rod 171 in this case thus provides the trunnion mounting at both ends of the roller. This form of the invention will be satisfactory in many cases but the first described embodiment is more effective in preventing inadvertent disconnection of the roller and the flint wheel by rotation of the roller in the wrong direction.

It will be understood that various other changes and modifications may be made in the embodiments illustrated and described herein without departing from the scope of the invention as defined in the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A lighter of the class described comprising, in combination, a main body portion including a liquid-tight casing providing a reservoir for liquid fuel, said casing having parallel side walls, parallel end walls, and top and bottom walls, a wick within said reservoir and having an end protruding through said top wall adjacent one edge thereof, one of said end walls and said side walls being extended upwardly beyond said top wall to provide an enclosure for operating mechanism for the lighter, a unitary assembly comprising a supporting frame, a snuffer cap pivoted to said frame, and a flint and flint projector carried by said frame, said assembly fitted snugly within said enclosure, means for securing said assembly to said body portion, and actuating means for said lighter which includes a flint wheel disposed adjacent said flint and said wick end, said wheel, said wick end, and the projecting end of said flint being covered by said snuffer cap when closed, and a snuffer device carried by the underside of said cap above said wick end, said snuffer cap being provided with an extension beyond its pivot point, a return bent leaf spring, one arm of which is in contact with a portion of said frame and the other arm bears against said cap extension to bias the cap toward its extreme open and closed positions, and a single screw passing through the first named arm of said spring and a portion of the frame and threaded into the top wall of the casing, said screw comprising the sole means for fastening the unitary assembly to the body portion of the lighter.

2. A lighter of the class described comprising, in combination, a main body portion including a

liquid-tight casing providing a reservoir for liquid fuel, said casing having parallel side walls, parallel end walls, and top and bottom walls, a wick within said reservoir and having an end protruding through said top wall adjacent one edge thereof, one of said end walls and said side walls being extended upwardly beyond said top wall to provide an enclosure for operating mechanism for the lighter, a unitary assembly comprising a supporting frame, a snuffer cap pivoted to said frame, and a flint and flint projector carried by said frame, said assembly fitted snugly within said enclosure, means for securing said assembly to said body portion, and actuating means for said lighter which includes a flint wheel disposed adjacent said flint and said wick end, said wheel, said wick end, and the projecting end of said flint being covered by said snuffer cap when closed, and a snuffer device carried by the underside of said cap above said wick end, said flint and flint projector being enclosed in a tubular element secured to the frame of the unitary assembly and abutting the end wall extension, said projector including an adjustment plug threaded into the end of said tube and a coil compression spring disposed in said tube between the plug and the flint, manipulating means provided on the exposed end of the plug and an opening in the end wall extension for access to the plug.

3. A lighter of the class described comprising, in combination, a main body portion including a liquid-tight casing providing a reservoir for liquid fuel, a wick within said reservoir and having an end protruding through said top wall adjacent one edge thereof, a self-contained unitary top assembly for detachable connection with the body portion of said lighter, said assembly comprising a box-like sheet metal supporting frame, a snuffer cap hinged to said supporting frame, said cap being of box-like configuration complementary to said frame to conform to the rectangular contour of the top of the lighter, a leaf spring secured to said frame and adapted to bear against a portion of said cap to bias it toward its extreme open and closed positions, a flint-containing channel on said frame, and means for readily securing said assembly to the body of the lighter, said means comprising a single fastening element, which also serves to secure said leaf spring in place, and a cooperating flint wheel carried by said body portion and disposed adjacent the end of the flint containing channel of the detachable assembly.

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