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LIGHTER

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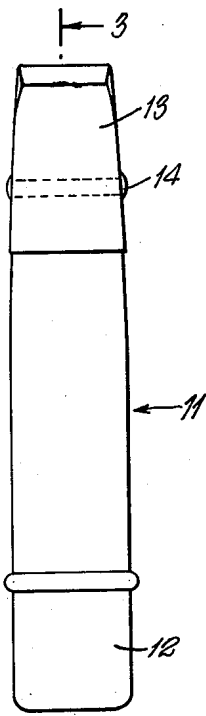


Fig. 1.

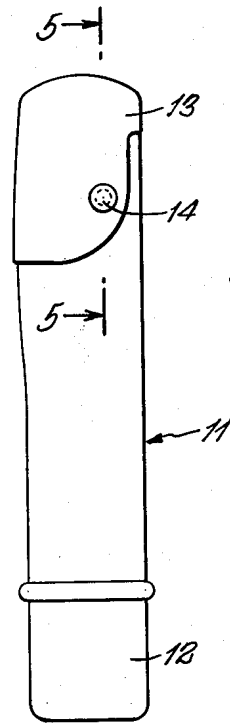


Fig. 2.

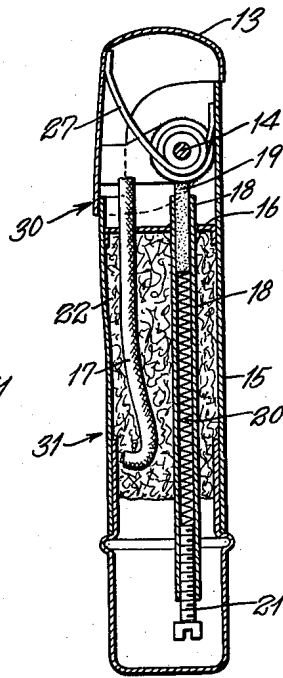


Fig. 3.

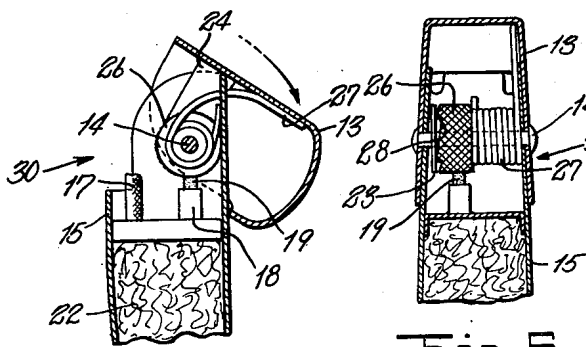


Fig. 4.

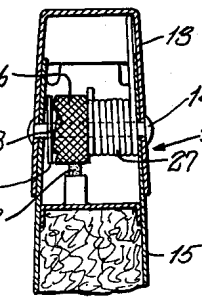


Fig. 5.

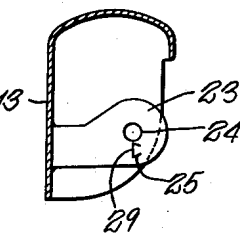


Fig. 6.

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1 Claim. (Cl. 67-7.1)

1

My invention relates to improvements in pyrophoric lighters for lighting cigars and cigarettes and is particularly directed to a lighter of extreme simplicity of construction that may be easily and safely operated with the thumb of one hand.

It is an object of my invention to provide a lighter in which the sparking wheel is positively driven by the lighter cap and is rotated through a wide arc to produce an efficient spark, and in which the number of operating parts is reduced to a minimum.

Other objects and advantages of my invention will appear from the following description of a preferred embodiment and from the drawings, in which:

Fig. 1 is a front view of the lighter;

Fig. 2 is a side view of the lighter;

Fig. 3 is a cross-sectional view of the lighter taken along the line 3-3 of Fig. 1;

Fig. 4 is a side-cross-sectional view of the upper section of the lighter showing the operation of the cap;

Fig. 5 is a front cross-sectional view of the upper section of the lighter taken along the line 5-5 of Fig. 2;

Fig. 6 is a side cross-sectional view of the lighter cap.

As can be seen from a comparison of Figs. 1 and 2, the external parts of the lighter comprise a body portion 11, a closure 12 which nests in the open bottom of the body portion 11 and a lighter cap 13 pivotally affixed to the body by pin 14. The top of the lighter cap is gently rounded to be engaged by a thumb or other finger of a hand and to be actuated thereby. The cap extends down over the body of the lighter in front and curves upward at the rear.

As shown in Fig. 3, the body portion 11 consists of an outer wall 15, a base plate 16 affixed to the inside of said wall near the upper portion of the body and which divides the body portion into an upper section 30 and a lower section 31. The upper section 30 is of a generally rectangular cross-sectional shape. The base plate is provided with an aperture for the wick 17 and with a threaded flint tube 18 which projects there-through and which contains the flint 19, the flint spring 20 and the adjusting screw 21. The lower section 31 is filled with an absorbent mass 22 to absorb and hold the lighter fluid. The closure 12 which fits snugly into the body conceals the absorbent mass and the flint tube, prevents the lighter fluid from evaporating and provides the means by which the wick may be replaced, the

2

flint replaced or adjusted, and the fluid supply replenished.

As shown in Figs. 3 and 4, the outer wall 15 of the upper section 30 is formed so as to provide a high upstanding rear portion by which the pin 14 and the cap 13 are supported and which continues around both sides of the upper section so as to provide a wind deflector for the sparking means and the wick. Directly before the wick at the front of the lighter, the wall is cut down to provide an entrance for the cigar or cigarette end when the cap is lifted.

As can best be seen by a comparison of Figs. 3 and 5, pin 14 projects through both sides of the outer wall 15 at the rear of the lighter and through both sides of the cap 13; the protruding ends of the pin are spread. Thus, the cap is rotatably affixed to the lighter body, and as can be seen from a comparison of Fig. 2, showing the cap in the closed position and Fig. 4 showing the cap in the open position, due to the shape of the cap and the off-center position of pin 14, the cap is capable of rotating some 100° to 110° from the closed to the fully open position when the outside rear wall of the cap contacts the rear wall of the upper section.

As can best be seen in Fig. 6, a plate 23 is affixed to the inside of the front of the cap 13. The plate 23 is provided with an aperture 24, through which the pin 14 fits when the lighter is assembled. Plate 23 is provided with an extended portion 25 having a cam 29 which is adapted to engage the sparking wheel.

As shown in Fig. 5, rotatably mounted on the center portion of pin 14 between the walls 15 of the upper section 30 is plate 23, sparking wheel 26, and coiled spring 27. Coiled spring 27 is tightly wound so that the coils contact each other. The left side of wheel 26 is provided with four wedge-shaped elements 28, radially disposed at equal angular intervals thereon. Plate 23 rests against the shaped side of wheel 28 and cam 29 is in position to engage one of the elements of the wheel when the cap is opened approximately 10° to 20°. The rim of wheel 26 rests on top of flint 19 which is pressed against the roughened surface by spring 20 and screw 21. Spring 27 is coiled around pin 14 and one end of the spring presses against the inside of the front wall of the cap and the other end presses against the inside of the back wall of the upper section.

As shown in Fig. 4, the lighter is operated by manually opening cap 13, causing it to rotate on pin 14 in the direction of the arrow. As pre-

viously explained cap 13 is positioned to rotate some 100° to 110°, but sparking wheel 26 has only four wedge-shaped elements on it and thus can be rotated only approximately 90°. Thus the movement of the cap which causes plate 23 to rotate on pin 14 moving cam 29 toward the wedge-shaped element of wheel 26 encompasses some 10° to 20° of rotation before the cam contacts the wedge element. In this interval of movement coiled spring 27 is being wound, which causes its tightly coiled width to expand between the walls of the upper section and the flat side of wheel 26 and forces the shaped side of the wheel 26 against plate 23, so that when the cam contacts the wedge-shaped element of the wheel to cause the wheel to rotate, there is a positive pressure between the wheel and the plate which insures that the cam will engage the wheel and positively rotate it. This pressure increases as the wheel is rotated.

Thus as cam 29 rotates wheel 26, the wheel strikes a shower of sparks from flint 19 directed against wick 17.

The ends of coiled spring 27 are brought closer together as the cap is opened, and as soon as finger pressure is released the cap snaps closed under its urging, extinguishing the flame of the wick.

The wedge elements of the sparking wheel are shaped so as to be engaged by cam 29 when the cap is moved clockwise, but to permit the cam to slip back to its original position without the wheel being rotated when the cap moves counter-clockwise as seen in Fig. 4. The wheel is held against reverse rotation by the pressure of the flint against its rim.

Since wheel 26 rotates approximately a full 90°, an efficient shower of sparks is produced, and a wheel of smaller diameter than is ordinarily used in pyrophoric lighters is made possible. Also since only four wedge-shaped elements need be provided in one side of the wheel, the wheel is less expensive to manufacture.

The driving means for the wheel is of a positive type, as previously described, thus the wheel is not spun by a spring, and does not require a high moment of inertia to strike a satisfactory spark.

Each wedge-shaped element of the wheel is engaged in turn as the lighter is successively operated. Thus the wear on the wedges is equalized and a long-lived and dependable sparking mechanism is achieved.

Having thus described my invention, what I desire to claim as new is:

In a lighter, a body portion, a cap thereon adapted to be manually opened and spring-urged to closed position, the body portion having a base plate dividing the body portion into an upper section and a lower section, the walls of the upper section being low in the front of the lighter and being high at the rear and upwardly curved therebetween, the cap fitting exteriorly over the walls of the upper section, the walls of the cap being low at the front of the lighter and being high at the rear and downwardly curved therebetween, said lower section including a fuel chamber containing an absorbent mass, a wick, and a flint tube with a flint com-

pressed spring, and adjusting screw therein, said wick and flint projecting through the base plate into the upper section, the cap having affixed to it a plate with a cam thereon, a cap, a plate, a sparking wheel positioned next to the plate, and a coiled spring positioned between the sparking wheel and a side wall of the upper section, all being rotatably mounted on a pin which passes through the side walls of the upper section of the lighter; and the side walls of the cap, at the rear of the lighter and which is positioned over the flint, the rim of the sparking wheel contacting the flint, the sparking wheel having four wedge-shaped elements radially disposed at approximately equal angular intervals of 90° on the side thereof positioned next to the cam; the elements being shaped to engage the cam as it rotates when the cap is opened and to slip by the cam as the cap closes, the cam lying between two of the wedges when the cap is closed, the shape of the walls of the cap being high at the rear of the lighter and the position of the pin being mounted at the rear of the lighter permits the cap, affixed plate and cam to rotate through an angle of approximately 110° before the upper rear wall of the cap contacts the rear wall of the upper section, whereby when the cap is opened, the cap, affixed plate and cam rotate in respect to the body portion approximately 20° before the cam contacts a wedge-shaped element, the cam successively engaging each wedge-shaped element in turn as the cap of the lighter is successively opened and closed, the coiled spring pressing the shaped side of the wheel against the plate and cam, the spring being coiled around said pin in a plurality of convolutions lying side by side, said convolutions filling the space between the wall of the upper section and the adjacent side of the sparking wheel along said pin, said spring having one end pressing against the inside of the top of the front wall of the cap and the other end pressing against the inside of the top of the rear wall of the upper section whereby when the cover is manually opened the two ends of the spring are brought across each other and an additional length of spring is bent around said pin, thereby increasing the coiled width of the spring along the pin and increasing the pressure between the sparking wheel and the plate and cam, before and after said cam contacts the wedge-shaped element of the sparking wheel.

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