

Sept. 8, 1931.

E. I. ROGERS, JR

1,822,505

LIGHTER

Filed Jan. 14, 1928

2 Sheets-Sheet 1

Fig. 1.

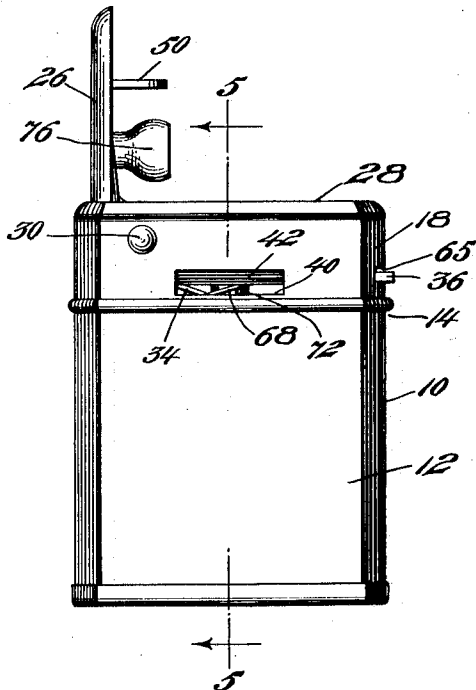


Fig. 2.

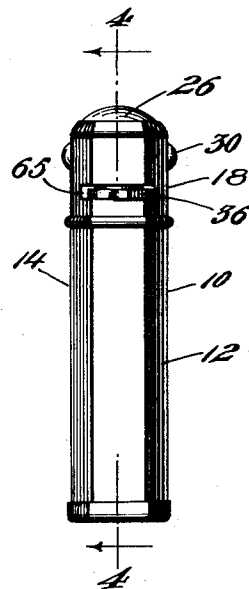


Fig. 3.

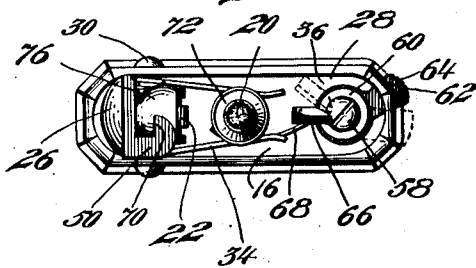
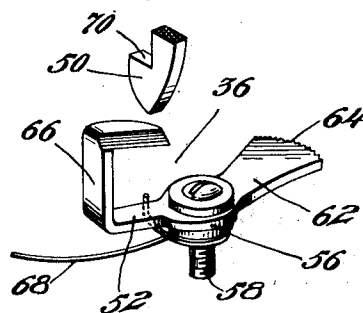


Fig. 4.



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Fig. 4.

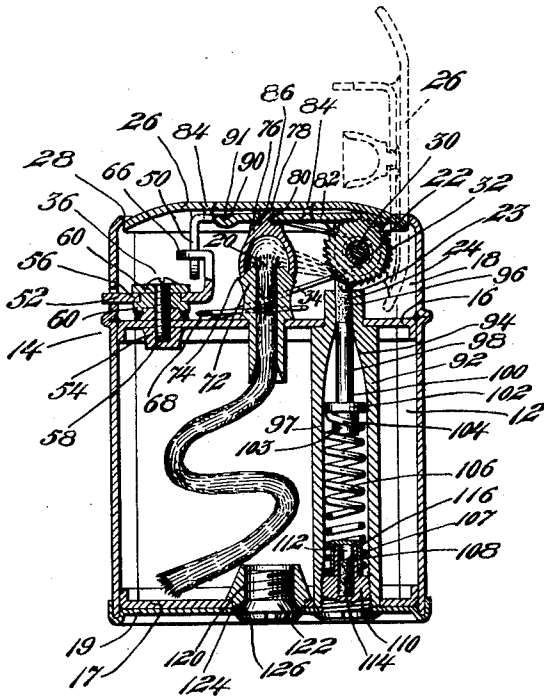


Fig. 5.

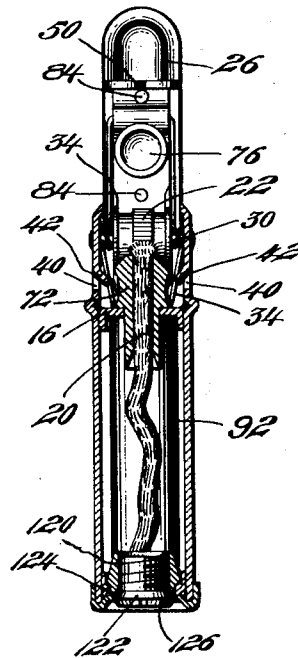


Fig. 6.

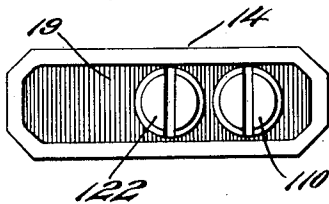
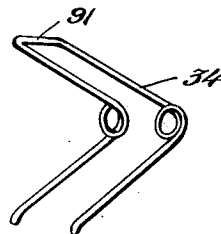


Fig. 7.



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UNITED STATES PATENT OFFICE

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LIGHTER

Application filed January 14, 1928. Serial No. 246,851.

My invention relates to lighters, particularly pocket cigar or cigarette lighters.

An object of my invention is to provide a lighter which will not go out when subjected to a wind. I therefore provide a windshield projecting upwardly from the top of the lighter casing normally enclosing the ignitable pyrophoric and friction elements. The walls of the windshield are provided with draft openings and adjacent to the openings there are inwardly and preferably downwardly projecting deflection lips terminating below the normal burning point of the wick. I am thus enabled to provide a lighter which will furnish sufficient air for the continued ignition and burning of the ignitable element in which the draft is so deflected that it does not directly blow on the flame.

Further features of my invention relate to the specific construction of the lighter I preferably employ.

These and such other objects of my invention as may hereinafter appear will be best understood from a description of the accompanying drawings, which illustrate the features of my invention incorporated in my improved specific type of automatic lighter.

In the drawings, Fig. 1 is a side elevation of the preferred embodiment of my invention with the cover pivoted to open position.

Fig. 2 is an end elevation thereof with the cover closed.

Fig. 3 is a plan view of my invention with the cover pivoted to open position.

Fig. 4 is a longitudinal sectional view of my invention taken along the line 4—4 of Fig. 2.

Fig. 5 is a cross sectional view of my invention taken along the line 5—5 of Fig. 1.

Fig. 6 is an inverted plan view of my invention.

Fig. 7 is a perspective view of the spring I preferably employ to normally urge the cover to open position.

Fig. 8 is a detailed perspective view of the safety catch I preferably employ which is releasable only in lateral plane.

In the drawings, wherein like characters of reference indicate like parts throughout, 10 generally indicates an automatic lighter constructed in accordance with the teachings of my invention. Said lighter includes the body portion 12, which is preferably formed by dividing the casing 14 by the partition 16 into the lower reservoir or body portion 12 and the upper combination combustion chamber and wind shield 18. As shown more particularly in Fig. 4 this improved type of construction permits both the combustion chamber and fuel reservoir to be constructed of one integral piece of metal thereby eliminating the necessity of separate wind shields and separate fuel reservoirs normally enclosed by a separate casing and thereby decreasing the size of the pocket lighter. In order that the lighter may readily fit in the pocket I preferably construct the casing 14 of oblong shape.

The upper portion of the casing 14 thus forms a combustion chamber and wind shield 18 in which the ignitable element 20, the friction element 22, and the pyrophoric element 24 may all be conveniently mounted.

While, as stated, certain features of my invention may be incorporated in any desired type of a lighter, my invention is specifically adapted for use in the type of automatic lighter in which the opening of the cover simultaneously causes the friction element 22 to strike the pyrophoric element 24 to ignite the ignitable element 20. I thus provide the cover 26 for the open upper end of the combustion chamber 18. Said cover 26 is pivotally mounted on the cover pivot shaft 30 which is preferably mounted transversely of one end of the combustion chamber 18. I preferably provide means operated by the cover 26 to cause movement of the friction element 22 against the pyrophoric element 24. In order that this may be accomplished in a simple manner without the employment of any extra cams, springs, etc., I preferably mount the friction element 22 rigidly to the cover 26 so that it will move against the pyrophoric element 24 on raising of the cover 26. For this purpose in my preferred embodiment, I therefore preferably

employ a friction wheel 22 which is mounted on the cover pivot shaft 30 and which preferably has the teeth 32 thereof rigidly embedded into the cover so that the wheel 22 will rotate on opening of the cover 26. I also as in automatic lighters provide means 34 to normally urge the cover 26 to open position which in my preferred embodiment comprises the wire 34 bent so as to abut the partition 16 and the lower side of the cover 26 so as to normally urge the cover 26 to open position. In order that the cover when not in use may be normally retained in closed position, I provide for this purpose the safety catch 36. It is thus apparent that on release of the safety catch the spring 34 will urge the cover 26 to open position thereby causing contacting engagement of the friction element 22 with the end of the pyrophoric element 24 to throw a spark against the top of the ignitable element 20 to light the lighter.

It is thus apparent that the encompassing wall of the combustion chamber 18 forms a wind shield for the ignitable element, but that in order for the ignitable element which normally consists of the wick 20 rising through the partition 16 from the fuel reservoir 12 to burn, I preferably provide suitable means to supply air thereto which in my preferred embodiment consists of a draught opening 40 in the wall of said combustion chamber 18 preferably below the normal burning point of and near the ignitable element. As my preferred type of draught opening 40 I preferably provide what might be termed a louvre draught opening, namely, one provided with an inwardly projecting lip to direct the air at the desired point. For this purpose I provide the air deflection lip 42 projecting inwards from the top of said opening and terminating below the normal burning point of and near the ignitable element 20 so as to deflect the air into the combustion chamber 18 below the wick end so as not to blow it out. As the preferred shape of my wind shield is oblong, it is obvious that I am enabled to provide a louvre draught opening 40, preferably also oblong in each side wall thereof near the ignitable element and I am enabled also to provide the deflection lips 42 of relatively short length. As shown in my preferred embodiment, said deflection lip 42 is preferably inclined downwardly so as to direct the air below the burning point of the ignitable element. It is thus obvious that by employing the windshield 18, I may readily mount the pivot shaft for the cover 26 and the friction element 22 on said windshield as shown.

A further feature of my invention relates to a type of safety catch 36, particularly adapted for use in automatic lighters which for the safety purpose explained above is only

releasable in a lateral or horizontal plane and can not be released on a straight push such as often occurs in the pocket of the user. To this end I provide the latch lug 50 depending from the cover near the opposite end of said cover 26 from the pivot end thereof and I suitably mount the catch proper 52 preferably on top of the partition 16 as shown in Fig. 4. I provide the partition 16 with the closed threaded socket 54 closed to prevent leakage of the fuel from the fuel reservoir when the catch 52 is removed from the partition 16. Said catch proper 52 normally includes the lever 56 which is preferably mounted between the washers 60 on the pivot pin 58 threadedly secured within said closed socket 54. Said lever 56 is provided with a power arm 62 preferably provided with the knurled end 64 for friction engagement with a finger projecting through a slot 65 in the end wall of said combustion chamber 18 sufficiently large to permit lateral pivotal movement thereof within. Said lever 56 is provided with the work arm 66 preferably bent to a position to enable it on proper movement thereof to engage said latch lug 50 depending from the cover and I provide suitable means such as the spring 68 to normally urge said lever 56 to cause the work arm 66 to engage said latch lug 50 to retain said cover 26 closed. To release the cover therefor, it is obvious that all it is necessary to do is to move the power arm 62 of the lever laterally to the left to cause the work arm 66 to move to a position free of the latch lug 50 when the spring 34 will urge the cover 26 to open position and preferably in an automatic lighter also simultaneously ignite the wick 20. It is also apparent that when the cover 26 is pushed down to closed position the latch lug 50 will bear laterally against the work arm 66 to cause it to move laterally against the force of the spring 68 until it is free to register by force of pressure of the spring 68 into locking engagement with the notch 70 in said lug 50.

As stated a further feature of my invention relates to the combination snuffer and vapor seal I preferably employ. It is apparent that unless means is provided to seal the vapor admitted to the wick 20 when the lighter is not in use, a considerable amount of fuel will leak from the wick 20 and not only cause an unpleasant smell in the pocket, but will result in the lighter becoming more often out of fuel. While I am aware that others have provided vapor seals, my invention specifically relates to a type of vapor seal adapted to accurately seat and thus prevent any loss of fuel vapor when the lighter is not in use. To this end I mount the hollow ball valve seat 72 on said partition 16 through which the ignitable end of the wick 20 projects, the upper surface 74 of the seat being of a general circular configuration.

The combination snuffer seal and vapor proper consists of a valve socket 76 loosely mounted on said cover 26 to permit slight vertical and horizontal or universal movement of said socket 76 to fit tightly on said ball valve seat 72. In my preferred embodiment, I preferably construct said socket 76 on said cover 26 in the following manner; I provide the upper end of said socket 76 with the head 78 on top of the rod 80 projecting upwards therefrom. I rigidly secure to the lower side of the cover 26 the plate 82 preferably by means of the rivets 84 which plate 82 has the hole 86 therein preferably of slightly larger diameter than the diameter of the rod 80 to permit slight lateral movement of the rod 80 and hence socket 76 therein. As the rod 80 is slightly longer than the thickness of the plate 82, it is obvious that it will also have a slight vertical movement therein, the pressure of the cover itself serving to seat the socket 76 firmly on the ball valve seat 72. In my preferred embodiment, I employ the plate 82 to form additional functions. I provide it with the groove 90 for retaining the end 91 of the spring 34 therein and I bend the outer end thereof downwardly to form the latch lug 50 for the safety catch 56. It is thus obvious that as the plate 82 and cover 26 are both slightly resilient and as the plate 82 is slightly offset from the cover 26 that there will be a sufficient universal movement of the socket 76 to permit it to move both vertically and horizontally to accurately align itself on the ball valve seat 72 and be firmly retained thereon by downward pressure of the plate 82 and cover 26.

A further feature of my invention relates to the mounting of the pyrophoric element 24 in relation to the friction element 22 so that the spark may be thrown in the desired plane toward the igniting part of the wick 20 or other ignitable element employed. In my preferred embodiment, I preferably mount the pyrophoric element 24 within the tube 92. Said tube is provided with means to resiliently press the end of the pyrophoric element 24 into operative contact with the teeth 32 of the friction element 22. I am aware that others have mounted the flint advancing tube 92 at an angle across the fuel reservoir 12. Instead of making the friction element contacting end 23 of the flint or other pyrophoric element employed contact the friction element 22 at an angle to throw the spark towards the igniting portion of the wick 20 in a tangential plane, I accomplish the same result in a different manner without mounting the flint advancing tube 92 across the fuel chamber in the way of the refilling of the fuel reservoir and replacing the wick 20. I thus permit the spark to be thrown from the end 23 to the top of the wick 20 in a tangen-

tial plane, but instead of forming a hypotenuse as formerly change the length of the legs of the right triangle to accomplish the same result. Thus as shown I preferably mount the end 23 of the pyrophoric element 24 and also the flint advancing tube if employed, spaced a predetermined amount away from the vertical line depending downwards from the pivot point of the friction element shaft 30 and it is thus apparent that said end 23 will be automatically forced upwardly a sufficient amount away from the lower horizontal line of the friction element 22 to throw the spark directly at the top of the wick 20 and accomplish the same result as if the end 23 of the pyrophoric element 24 were held perpendicular to its point of contact with the friction element 22. I thus am enabled to throw a spark in any desired direction towards the top of the wick 20 without placing the flint advancing tube across the fuel reservoir to interfere with the filling thereof and the replacement of the wick 20.

A further feature of my invention relates to a provision of a more positive means than any hitherto employed to resiliently press the end 23 of the pyrophoric element 24 in contacting relationship with the teeth 32 of the friction element 22 to insure that the flint 24 will always press frictionally against the friction element 22 to always function. I thus construct the flint advancing tube 92 of relatively large diameter converging in the funnel 94 towards the flint projecting end 96 thereof, the portion 97 thereof which normally holds the spring being of substantially larger diameter than the spring. To provide means to continuously advance the flint through the portion 96 of relatively smaller diameter I provide the plunger 98 having the plunger rod 100 adapted to contact the flint 24 and the spring seat 102 of relatively larger diameter against which may seat the upper end 104 of the resilient flint advancing means 106. By constructing the flint advancing tube 92 of relatively large diameter I am enabled to employ a relatively large and powerful spring to insure consistent advance of the flint with sufficient force. In order, however, that the spring 106 will not frictionally engage or bind against the side of the tube 92 I preferably construct it of relatively smaller diameter than the internal diameter of the portion 97 of the tube 92 and provide suitable means to align said helical spring centrally of said tube 92 away from contact with the sides thereof. For this purpose I provide the nub 103 projecting downwards from the spring seat 102 of the plunger 98 of substantially the same outer diameter as the internal diameter of the upper end 104 of the helical spring 106 so that the upper end 104 of said spring will at all times re-

siliently encompass said nub for accurate alignment of said spring within said tube and to permit withdrawal of said plunger 98 on withdrawal of the spring 106 from said tube 92. To align the spring 106 in the lower portion of said tube 92 I provide the nub 108 of substantially the same outer diameter as the inner diameter of the lower end 107 of the spring 106 to register therein and accurately align the spring 106 in the lower portion of said tube 92. It is obvious, however, that if desired the spring aligning nubs 103 and 108 may be omitted without detracting from the novel advantages of a funnel shaped tube 92 and larger resilient means 106.

A further feature of my invention relates to the novel means I preferably employ for storing a separate flint in a lighter of this description which means also preferably serves an additional function, namely, as an alignor for the lower end 107 of the helical spring 106 within the flint advancing tube 92. I therefore preferably construct the tube stopper 110 which is preferably threadedly engageable with the lower end of said tube 92 with a hollow central separate flint containing portion 112 which as shown in Fig. 4 has the separate flint 114 contained therein and the removable cap 116 for said portion 112 which cap 116 is preferably of a shape to register tightly within the lower end 107 of the spring 106 to accurately align it within said tube. While I am aware that others have located their spare flints in the gasoline tank stopper so far as I am aware no one has hitherto located their spare flint in the flint advancing tube stopper 110.

A further feature of my invention relates to the means I preferably employ to seal the fuel within the fuel reservoir 12. To this end I provide the socket 120 for the fuel plug 122 for the reservoir with a conical portion 124 and I provide the fuel plug 122 with a cooperating conical portion 126 adapted to register against the cone seat 124 in the fuel plug socket 120.

It is apparent that the improved type of lighter shown in these drawings may be fabricated and assembled in the following manner: First the hollow casing 14 is constructed and the partition plate 16 and base plate 17 are suitably mounted on each end of the flint advancing tube 92. These are then pushed upwardly within the casing 14 until the partition 16 is opposite its desired position and the base plate 17 is at substantially the bottom of the casing. The extra base plate 19 is then suitably soldered on top of the base plate 17 to the bottom of the lighter. The cover 26 already having mounted thereon the plate 82, the snuffer 76, the spring 34, lug 50 and friction wheel 22 carrying its pivot shaft 30 with the teeth 32 embedded

in said plate is inserted within the igniting chamber 18 and the pivot pin 30 suitably inserted in the side walls thereof. The safety catch 36 is suitably mounted on the partition 18 and when the cover is closed down the device is completed. It is obvious that by constructing the entire casing 14 of one integral piece of metal and separating it by the partition wall 16 into the lower fuel reservoir 12 and upper combustion chamber 18 that I am enabled to construct a very compact lighter out of a minimum number of parts and to eliminate the material and space formerly thought necessary for separate gasoline tanks, separate flint advancing tubes, separate wind shields etc.

It is understood that my invention is not limited to the specific embodiment shown and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What I claim is:

1. In a lighter, a body portion, an ignitable element mounted thereon, a pyrophoric element mounted thereon near the ignitable element, a friction element mounted on said lighter in operative contact with said pyrophoric element, and a substantially oblong windshield consisting of a wall surrounding the ignitable element projecting upwards from said body portion and having a single draught opening in each side wall thereof opposite the ignitable element and provided with an air deflection lip projecting inwards and downwards from the top of each of said openings and terminating below the normal burning point of and near the ignitable element.

2. In a lighter, a body portion, an ignitable element mounted thereon, a pyrophoric element mounted thereon near the ignitable element, a friction element mounted on said lighter in operative contact with said pyrophoric element and a windshield consisting of a wall surrounding the ignitable element projecting upwards from said body portion having all draft openings therein comprising draught openings in the side walls thereof provided with air deflection lips projecting inwards and downwards from the top of said openings and terminating below the normal burning point of and near the ignitable element.

3. An automatic lighter comprising a body portion, an ignitable element mounted on said body portion, a cover for said lighter pivotally mounted thereon, means to urge said cover to open position, a pyrophoric element mounted on said lighter near the ignitable element, a friction element mounted on said lighter in operative contact with said pyrophoric element, means operated by the opening of said cover to cause movement of said friction element against said pyrophoric element and a safety catch for nor-

5 mally securing said cover to said casing, said ignitable, pyrophoric and friction elements being all mounted above the body portion, and a windshield consisting of a wall
10 surrounding these elements mounted on top of said body portion having draft openings in the side walls thereof provided with deflection lips projecting inwards and downwards from the top of said openings and terminating below the normal burning point of and near the ignitable element.

4. An automatic lighter, comprising a casing, an ignitable element projecting upwards from the casing, a windshield consisting of
15 a wall encompassing said ignitable element mounted on top of said casing and having draft openings in the walls thereof provided with deflection lips projecting inwards and downwards from the top of said openings and terminating below the normal burning point of and near said ignitable element, a pivot shaft pivotally mounted on said lighter, a cover for said combustion chamber pivotally mounted on said shaft, resilient means to normally urge said cover to open position, a friction element mounted on said cover pivot shaft to rotate with said cover, a pyrophoric element mounted on said lighter in operative contact with said friction element, and a safety catch for normally
20 25 30 securing said cover to said windshield.

5. In a lighter, a body portion, an ignitable element mounted thereon, a pyrophoric element mounted thereon near the ignitable element, a friction element mounted on said lighter in operative contact with said pyrophoric element and a windshield consisting of a wall surrounding the ignitable element and projecting upwards from said body portion and having draft openings in the side walls thereof provided with air deflection lips projecting inwards and downwards from the top of said openings and terminating below the normal burning point of
35 40 45 and near the ignitable element.

6. An automatic lighter comprising a body portion, an ignitable element mounted on said body portion, a cover for said lighter pivotally mounted thereon, means to urge
50 said cover to open position, a pyrophoric element mounted on said lighter near the ignitable element, a friction element mounted on said lighter in operative contact with said pyrophoric element, means operated by the opening of said cover to cause movement of said friction element against said pyrophoric element and a safety catch for normally securing said cover to said casing and a windshield consisting of a wall surrounding said
55 60 ignitable, pyrophoric and friction elements mounted on top of said body portion and having draft openings in the side walls thereof provided with deflection lips projecting inwards and downwards from the top of
65 said openings and terminating below the

normal burning point of and near the ignitable element and having the cover and friction elements mounted thereon.

7. In a smoker's petrol lighter of the character described, the combination with a wick tube and a closing cap for the same of a wind shield surrounding the tube and being provided with apertures and with internal louvres adapted to deflect the wind from the end of the tube, said shield and louvres being arranged to permit the seating of the closing cap. 70 75

8. In a smoker's lighter of the character described, the combination with a wick tube and a closing cap for the same of a wind shield surrounding the tube, said shield being provided with apertures and with louvre plates internally bent off from said apertures so as to direct the wind towards the bottom of the shield, said shield and louvres being arranged to permit the seating of the closing cap. 80 85

9. In a smoker's petrol lighter of the character described, the combination with a wick tube of a wind shield surrounding the tube and being provided with apertures and with internal louvres adapted to deflect the wind from the end of the tube. 90

10. In a smoker's lighter of the character described, the combination with a wick tube of a wind shield surrounding the tube, said shield being provided with apertures and with louvre plates internally bent off from said apertures so as to direct the wind towards the bottom of the shield. 95 100

IN testimony whereof I affix my signature.
EVERETT IRVING ROGERS, JR.

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