Feb. 11, 1930. M. F. TAINTOR 1,746,321

AUTOMATIC LIGHTER

Filed Feb. 15, 1928

FIG. 1

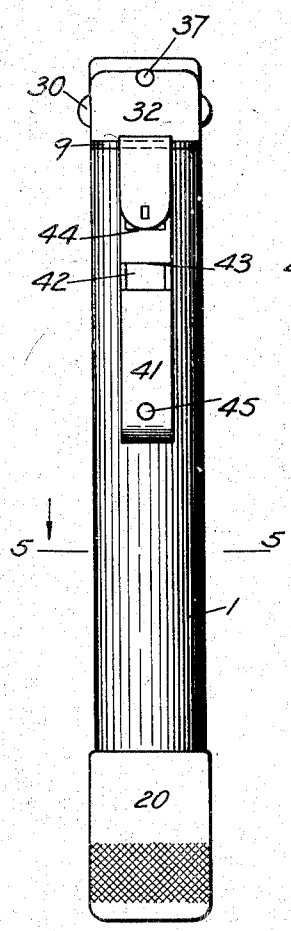


FIG. 2

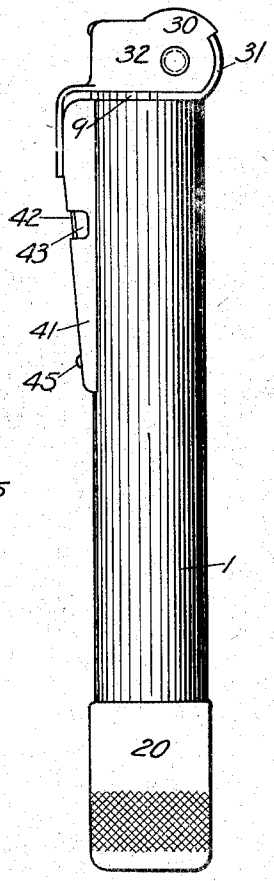


FIG. 3

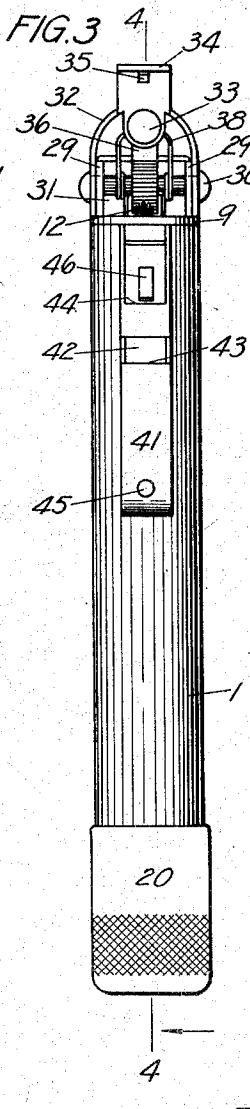


FIG. 4

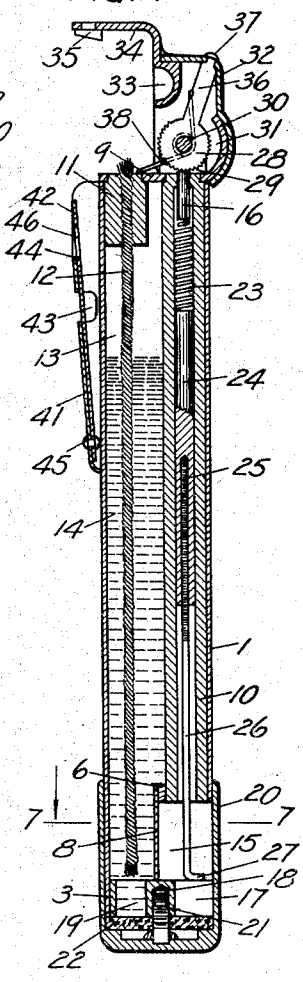


FIG. 5

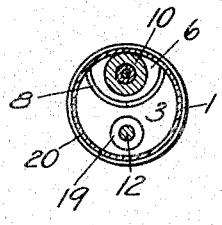


FIG. 6

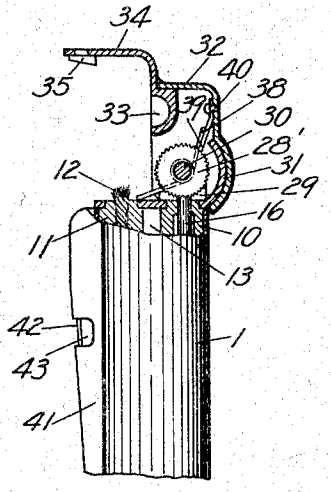
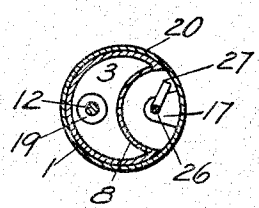


FIG. 7



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UNITED STATES PATENT OFFICE

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AUTOMATIC LIGHTER

Application filed February 15, 1928. Serial No. 254,327.

My invention relates to improvements in automatic lighters, and more especially to those designed for lighting cigars and cigarettes, wherein pyrophoric material and a friction member are employed to ignite a fuel-saturated wick, upon the opening of the lid or cover of the case containing these elements, the flame being extinguished when said cover is closed.

The primary object of my invention is to produce a lighter of this character which is so formed or shaped that it can be carried in a vest or other pocket and held in place by means of a clip of ordinary construction, is automatically lighted by simply pressing with the thumb or finger on a releasing member for the lid or cover, and extinguished by the mere act of closing said cover, is adapted to be ignited, used for the purpose of lighting a cigar or cigarette, and extinguished, with one hand and while held in the hand, is entirely reliable, and can be readily filled with liquid fuel and supplied with pyrophoric material.

Another object is to provide the lighter with a safety appliance whereby is prevented danger of ignition in the pocket and of any accidental ignition. This is an especially valuable feature, because it renders the lighter safe at practically all times.

A further object is accomplished by mounting on the same axis the lid or cover and the friction member, since thereby are obtained additional degrees of compactness and simplicity.

This lighter is attractive and lends itself readily to the application thereto of an ornamental finish, owing to the shape and construction thereof.

Other objects and advantages will appear in the course of the following description.

I attain the objects and secure the advantages of my invention by the means illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of an automatic lighter which embodies a practical form of my invention, the cover being closed; Fig. 2, a side elevation of said lighter, with the cover closed; Fig. 3, a front elevation of the lighter, with the cover open; Fig. 4, a central, vertical section through the lighter, taken on lines 4—4, looking in the direction of the associated arrow, in Fig. 3, the cover being open; Fig. 5, a cross section through the lighter, taken on lines 5—5, looking down, in Fig. 1; Fig. 6, a side elevation and partial section of the upper portion of a lighter which embodies a slight modification, and Fig. 7, a cross section on lines 7—7, Fig. 4, looking down.

Similar reference characters designate similar parts throughout the several views.

The case of this lighter is preferably long and narrow or slim and generally cylindrical in type to enable the same to be carried conveniently in a pocket and to be held therein by means of an ordinary pen or pencil clip applied to said case. This case comprises a tubular body 1 having bottom or floor members 3 and 6 respectively on lower and upper planes, a curved wall 8 between said bottom members, a top 9, a tubular holder 10 between the more elevated bottom member and said top, and secured to the back side of said body, and a cylindrical holder 11, for a wick 12, secured to the front of said body and to said top. The lower member or floor 3 is approximately coextensive in area with the interior of the body 1, but the upper member 6 is merely a filling piece that extends part way around the lower end of the holder 10 between the upper end of the wall 8 and the back side of the body 1. Within the body 1 is a chamber 13 for a liquid fuel, as 14, and the wick 12 extends downwardly from the holder 11 into said chamber and into the fuel therein. The upper portion of the wick 12 passes through a vertical opening in and protrudes above the top of the holder 11. The wick functions in a similar manner to any wick in a device of this character, and when consumed is replenished in the usual manner. The holder 10 has therein a longitudinal passage which opens through the bottom thereof into a small chamber 15 in the body 1, and at the upper end into the space above the top 9. The chamber 15 is formed by the bottom members 3 and 6, the lower end of the holder 10, and the wall 8, being open

behind. The upper terminal of the passage in the holder 10 is constricted to a diameter approximately equal to that of a length of pyrophoric material such as is represented at 16. The upper surfaces of the top 9 and the holders 10 and 11 are approximately on the same level. There is a vertical recess 17 in the back side of the floor 3 into which the chamber 15 opens at the bottom. In the axial center and opening through the under side of the floor 3 is a tapped passage 18. A filling hole 19 is provided in the floor 3 below the chamber 13.

A closure or cap 20 is provided for the bottom of the body 1, and said cap has secured in the axial center thereof a screw 21 which is adapted to enter and engage the threaded sides of the passage 18 in the floor 3. A packing disc 22 is placed in the cap 20 around the screw 21. The cap 20 is slipped onto the body 1 from below and pressed upwardly until the screw 21 enters the passage 18, when said cap is rotated in the direction to cause said screw to rise in said passage until the disc 22 is forced tightly against the under side of the floor 3. The cap 20, when in place, entirely closes the lower terminal of the body 1, including the open side of the chamber 15, and the disc 22 seals the filling opening 19 and prevents any of the fuel 14 from escaping therefrom. No escape of the fuel can now take place except by capillary attraction through the wick 12.

Upon inverting the body 1 and unscrewing and removing the cap 20 with the disc 22 access is had to the opening 19, and liquid fuel can then be poured into the chamber 13, after which said cap is replaced.

In the passage in the holder 10, below the length of pyrophoric material 16 (which may be termed a sparking stick), is a spiral spring 23, below that in said passage is a supporting rod 24 having in the axial center thereof a screw-threaded opening 25 to receive the screw-threaded upper terminal of an adjusting rod 26. The rod 26 at the lower end is bent at right-angles to the main portion of said rod, as represented at 27, to form a foot to rest on the floor 3 and thereby retain said rod and the rod 24 in supporting relation to the spring 23. The spring 23 directly holds the sparking stick 16 against a friction member 28 (or 28′) presently to be described, which member is above said stick, and said spring causes said stick to be fed upwardly to said friction member as the stick wears away. The amount of force exerted by the spring 23 on the stick 16 is regulated by screwing the rod 26 farther into the rod 24 to decrease the amount of force or pressure, because the distance between the stick and rod is thereby increased and the spring permitted to expand to a greater extent, and by screwing said first-named rod in the opposite direction to increase said pressure, because the distance between the upper rod and the stick is then decreased and the spring is compressed to a greater extent.

Upon removing the cap 20 from the body 1, access is had to the foot 27 which is then in the chamber 15, and the rod 26 is partially rotated, by means of said foot to enable the latter to descend into or enter the notch 17, when said rod and the attached rod 24 can be drawn outwardly to enable said first-named rod to be screwed farther into or out of said second-named rod for adjustment purposes, or the parts can be entirely removed and also the spring 23 when it is necessary to renew the sparking stick. While the body 1 is inverted, the sparking stick is dropped into the now upper end of the passage in the holder 10, the spring 23 is introduced through said end, and the rod 24 is inserted therein. Next, by means of the rod 26, the parts are pushed along in the holder passage until the sparking stick comes into contact with the friction member, and then the rods are forced farther in the same direction, against the resiliency of said spring, until the foot 27 is in the chamber 15, when the smaller rod is partially rotated to locate said foot in supporting position relative to the floor 3. Finally the cap 20 is slipped onto the body 1 and screwed into place.

Rising from the top 9 adjacent to the opposite sides thereof are two lugs 29 through which extends a horizontal rod or spindle 30. A lip 31 also rises from the top 9 at the back. The lip 31 is in the form of an arc centering on the axis of the spindle 30. A cover 32 is mounted on the rod 30 and has a rear, arcuate part to fit over the lip 31. The sides of the cover 32 are outside of the lugs 29. On the inside of the cover 32 adjacent to the front side thereof is a recessed member 33 which forms an extinguisher. When the cover 32 is turned down onto the top 9 or closed, the extinguisher 33 is over the exposed part of the wick 12, and all of the parts above said top are inclosed within said cover augmented by the lip 31. A latch 34 extends forwardly and downwardly, or upwardly and forwardly, accordingly as said cover be in closed or open position, from the edge of said cover adjacent to the place where the extinguisher 33 is located. There is a lug 35 on the inner side in the center of the latch 34 adjacent to the free end thereof.

The rod 30 extends directly over the sparking stick 16, and the friction member 28 (or 28′) is mounted on said rod. The friction member 28 is in the form of or comprises a serrated or toothed segment against which the stick 16 bears, and is provided with an arm 36, while the friction member 28′ is in the form of or comprises a serrated disc against which a similar stick bears. In each case the serrations or teeth are on the periphery of the friction member and always in po-

sition to be contacted with by the sparking stick.

The arm 36 of the friction member 28 at its outer end is secured to the cover 32, as represented at 37, and a spring 38 is looped around the rod 30 on both sides of the friction member 28, and crossed over below or in front of said arm, according to position of the arm, and has its free ends bearing on the top 9 or on the top of the wick holder 11. Thus it is seen that the spring 38 tends constantly to actuate the arm 36 and the cover 32 upwardly, and to cause said cover when released to open forcibly and speedily. The opening movement of the cover is limited by the free edge of the arcuate part of said cover coming into contact with the back side of the body 1—see Fig. 4. The back portion of the cover which is contiguous with the lip 31, when the cover is open, is outside of said lip and conforms to the shape of the same. The cover 32 and the friction member 28, being mounted on the same axis, move together about said axis without interfering one with the other.

In the Fig. 6 construction, the cross-over part of the spring 38 bears against the top of the cover 32 inside of the same, and so serves the same purpose and operates in subtantially the same way as does the spring 38 in the first example.

A resilient pawl 39 has one terminal fastened at 40 to the top of the cover 32 inside of the same, and the other terminal arranged to engage the teeth on the friction member 28′, and is so positioned that it slips over the serrations on said member when said cover is closed the contact of the sparking stick 16 with said serrations then holding the member against rotation, but said pawl actuates said member on its axis when said cover is opened, with the same velocity as that of the cover. The friction member 28′ is held to the cover, so that it must move therewith, only when said cover is rocked or swung from closed to open position, the pawl 39 then being the holding agent.

Secured to the front of the body near the top thereof is a guard or keeper 41 comprising a front and two side pieces, and within this keeper is a flat spring 42. There is a recess 43 in the keeper intermediate of its top and bottom ends, and the upper portion of the front side of the keeper is cut away, as represented at 44. The spring 42 fits between the sides of the keeper 41, has its lower end riveted, as at 45, to the front of said keeper, extends upwardly beyond the bottom edge of the recess 44, and has therein just above said edge a recess 46.

The upper terminal of the spring 42 is in the path of the latch lug 35, and, when the cover 32 is closed, said spring is actuated inwardly by said lug until the latter enters the opening 46, which it does as soon as the cover is seated on the top 9, said opening being so located as to bring about this result. Thus the cover 32 is held in closed position over the wick 12 and the other parts and members on and above the top 9, and accidental release of the cover is prevented because the recess 44 is now closed by the lower part of the latch 34, and access to the spring 42 can only be had through the notch 43 in the keeper 41. However, upon placing the thumb nail against the exposed part of the spring 42, through the notch 43, and pressing said spring inwardly, it is actuated out of engagement with the latch lug 35, and the spring 38 immediately acts forcibly to throw the cover upwardly and rearwardly into open position, and at the same time to cause the friction member 28 (or 28′) to move rapidly across the top of the sparking stick 16, with the result that sparks are produced and the fuel with which the wick 12 is saturated is ignited.

In practice, assuming that the lighter be in readiness for use, and that the cover 32 is closed, the body 1 is held in one hand, and the latch 34 is released by pressing the spring 42 inwardly with the nail of the thumb of that hand, when said cover flies open and the friction member 28 (or 28′) is rapidly actuated over the contiguous end of the sparking stick 16. The sparks thus produced ignite the wick 12, and the flame from said wick is applied to the cigar or cigarette. In the closing operation, the cover is rocked forwardly and downwardly on the rod 30 until the latch lug 35 enters the spring opening 46. The cover in closing extinguishes the flame.

Generally the closing movement of the cover, and the movement imparted by said cover to the friction member 28 is so slow that no sparks are produced from the ignition stick 16 by the movement of said friction member, but, even if there were, they would be without effect because of the presence of the extinguisher 33 over the wick 12. In the case of the friction member 28′, the pawl 39 clicks over the teeth of said member without rotating the same when the cover is closed, and the member does not, therefore, act on the sparking stick. The wear on the sparking stick from the friction member 28′ may be a little less than that on the friction member 28, because the former acts on the stick only when the cover is opened, while the latter acts on the stick when the cover is closed as well as when it is opened, but such action coincidental with the closing operation is of a character that produces very little wear on the stick.

More or less change in the shape, size, construction, and arrangement of some or all of the parts of this lighter, in addition to those hereinbefore specifically pointed out, may be made without departing from the spirit of my invention, or exceeding the scope of what is claimed.

I claim:

1. In an automatic lighter, a case provided with a friction member, and having therein a tubular holder for pyrophoric material, and a notched floor, and also having a chamber between said holder and said floor, which chamber opens through one side, and spring-pressed supporting means in said holder for said pyrophoric material, said supporting means being accessible through the side opening to said chamber, and adapted to be withdrawn through the notch in said floor, and also to be supported in operative position by said floor.

2. In an automatic lighter, a case provided with a friction member, and having therein a tubular holder for pyrophoric material, and a notched floor, and also having a chamber between said holder and said floor, which chamber opens through one side, spring-pressed supporting means in said holder for said pyrophoric material, said supporting means being accessible through the side opening to said chamber, and adapted to be withdrawn through the notch in said floor, and also to be supported in operative position by said floor, and a removable cap for said case, which cap when in place closes said opening and notch.

3. In an automatic lighter, a tubular body provided with a floor in which is a filling opening and a threaded passage and a cap for said body, said cap being provided with a screw to enter said passage, whereby said cap may be secured in place over said opening and passage and removed at will.

4. In an automatic lighter, a tubular body having therein a fuel chamber and a chamber that opens through one side, and provided with a floor in which is a filling opening for said fuel chamber, a threaded passage, and a notch opening above into said second-named chamber, a tubular holder for pyrophoric material in said body above said second-named chamber, and a cap to close said filling opening, said notch, and the side opening to said second-named chamber, said cap being provided with a screw to enter said passage, whereby said cap may be secured in place and removed at will.

5. In an automatic lighter, a case provided with a friction member, a supporting rod in said case, a spring interposed between said rod and a piece of pyrophoric material, a rod adjustably connected with said supporting rod, and supporting means for said adjusting rod which latter is adapted to be positioned to bear on said means whereby the pyrophoric material is normally retained in contact with said friction member, the force of said spring may be varied and the parts may be removed from said case.

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