

# PATENT SPECIFICATION



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## COMPLETE SPECIFICATION.

### Improvements in Pyrophoric Pocket Lighters.

I, LOUIS AUGUSTE NEVIÈRE, a citizen of the French Republic, of Château de Meré, Artannes par Monts (Indre-et-Loire), France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement.—

This invention relates to automatic ignition devices or pocket lighters for lighting cigars, cigarettes and the like and for other purposes, and refers to that type of such devices having an inner member comprising a reservoir or carrier for combustible material and a combustion space, and an outer member or cover adapted to slide over the said inner member and provided with an aperture which in one position exposes the combustion space, together with pyrophoric ignition means adapted to ignite the combustible material when the inner member and the outer cover are slidden with respect to one another in order to open the combustion space to the outside.

The present invention relates more particularly to a pocket lighter constructed upon the foregoing principle and is designed to overcome certain drawbacks which have been observed in the use of such pocket lighters.

It has been found in practice that with pocket lighters of this description, there is a danger for the parts to telescope with respect to one another, when in the pocket or when not required, and a primary object of the invention is so to construct the telescoping parts that there is no liability of them telescoping with respect to one another when in the pocket, or when not required, whilst at the same time the lighter can be easily and conveniently manipulated to effect ignition. At the same time means are provided for preventing the telescoping parts becoming entirely detached from one another when not desired.

In carrying out this portion of the invention, the outer casing is so shaped that one portion thereof reaches to the end of the inner telescoping portion, even when the latter is in the outer position, and the outer casing is so shaped or cut away, that the parts can be pressed towards one another by the finger and thumb. With this construction there is no chance of the members being telescoped towards one another when in the pocket, whilst at the same time they can be thus manipulated when desired.

For preventing the entire detachment of the parts from one another, a plug or the like screwing into the inner member may be provided, such plug passing through a slot on the outer casing, so that when the plug is screwed into position it acts as a stop, preventing the outward movement of the members beyond the required position—an arrangement which has already been proposed with other telescoping lighters.

With pyrophoric lighters of the same general type it has been customary to employ a rotary striker, co-operating with a cerium iron stone or the like, in order to produce a spark when the striker is rotated with respect to the stone, and to throw a spark into the wick. Various constructions have been suggested for causing the rotation of the striker. For instance, it has been proposed to use rack and pinion and pawl and ratchet mechanism, or in the case of a lighter with a hinged lid to provide a hook pivoted to the lid, the said hook being adapted to engage with a pin, of which several are provided on a wheel in connection with the striker, so that the wheel is fed forward through a certain angular distance each time the striker is opened.

Lighters of the foregoing description have also in some cases been provided with air holes adapted to correspond when the parts are slidden into the posi-

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tion for ignition, and the present invention includes, as a subsidiary feature, an improved arrangement of such co-operating openings so that a carburetted mixture is formed even before the spark is produced, this enabling the device to be used in a high wind, or in circumstances in which the ordinary forms of lighters cannot be employed.

In order that the invention may be more clearly understood, it will now be described with reference to the accompanying drawing, in which Figs. 1 and 2 show respectively, as regards the first in perspective view (with a part removed) and as regards the second in elevation, two constructional parts of an automatic lighter made according to a first method of carrying out the invention.

Figs. 3 and 4 show in elevation (with parts removed) the same lighter assembled Fig. 3 showing it out of use and Fig. 4 in use.

Fig. 5 is a section on the line 6—6, Fig. 3.

Figs. 6 and 7 show respectively in elevation and in side view, a modified means for operating the striker or kindling device.

Fig. 8 shows in elevation another modified means for operating the striker.

Figs. 9, 10 and 11, show respectively in elevation, bottom plan and in section on the line 22—22, Fig. 10 (with parts not in section) an automatic lighter constructed according to a further method of carrying out the invention, the lighter being represented at Figs. 9 and 10 in the out of use position, and in Fig. 11 in the working position. Figs. 12 and 13 show respectively two details of the last lighter, the first being shown in side view and the second in perspective.

Referring to the drawings, *a* is a reservoir for petrol, with a wick *b* dipping into the same, a kindling stone, for instance of cerium iron *c*, and a striker *d* for producing sparks by friction against the said stone.

The reservoir is formed as a flat box, the larger walls of which extend beyond one of the narrow walls which carries the wick and the kindling device or striker. These larger walls are connected together by a plain portion *a*<sup>1</sup>, extending over the wick and the kindling device, so as to leave between it and the narrow wall a space *a*<sup>0</sup> opposite to the wick.

The box like member just described is adapted to be introduced into and slide within a cover *e* of corresponding shape provided with an end or base *e*<sup>1</sup> and an opening *e*<sup>0</sup>. Means are provided for pushing the end of the cover away from the portion *a*<sup>2</sup> of the reservoir *a*. This

is effected through the action of the spring *f* inserted between the wall *a*<sup>2</sup> and the end *e*<sup>1</sup>. The spring may consist of curved members connected together in pairs at the back, it may consist, as shown at Fig. 9 of a coil spring adapted to oscillate around a pin *f*<sup>1</sup> passing through a loop in the spring, one of the extremities of the spring being fixed against the wall *a*<sup>2</sup> of the reservoir or engaging a guide piece integral therewith, from which it can be easily detached in case of removal of the spring after having withdrawn the pin *f*<sup>1</sup>.

The kindling or striking device for the wick may be constituted by cerium iron stone *c* projecting from a tube *c*<sup>1</sup>, and by a rotary striker *d*, upon an axle *d*<sup>1</sup>. The tube *c*<sup>1</sup> when removed enables the reservoir to be filled with spirit.

The outer casing is cut away or bowed inwards at *e*<sup>2</sup> so that the inner casing *a* can be slidden inwards by pressing the ends of the device between the thumb and finger. It will however be observed that even when the inner casing *a* is in the outer position, it does not project beyond the end of the outer casing *e* so that when carried in the pocket, there is no liability of the parts being forced towards one another.

The ignition means may be of the character illustrated at Figs. 1—5, in which there is combined with the rotary striker *d* a pinion system *g* adapted to rotate about the spindle *d*<sup>1</sup> of the striker. *h* are racks mounted upon the cover and meshing with the pinions *g*, so that when the parts *a* and *e* are slidden together, the striker is rotated and a spark thrown on to the wick.

The rack and pinion system usually employed may be replaced by pins on the rotary wheel *g*<sup>2</sup> (Figs. 6 and 7) fixed at the side of the striker, and a pawl *h*<sup>2</sup> jointed to the wall of the outer cover.

In other cases a ratchet wheel *g*<sup>3</sup> may be provided and a similar pawl *h*<sup>2</sup> as shown at Fig. 8.

The reservoir *a* and the cover *e* are prevented from separating from one another by a spring clip *i* as shown at Fig. 3.

When the device is not in use the closed portion *a*<sup>1</sup> or unbroken surface covers, in normal conditions, the lateral opening *e*<sup>0</sup> in the cover. When the device is in use, the openings *a*<sup>0</sup> and *e*<sup>0</sup> come opposite one another and the flame is disclosed.

Figs. 9—13 show an automatic lighter of practical construction, but slightly differing from the foregoing.

The reservoir *a* and the cover *e* are substantially the same as those already described. The filling of the reservoir

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is effected by unscrewing a plug or stopper *j*, screwing onto the wall of the reservoir opposite to that from which the wick *b* projects. The cerium iron stone *c* is contained in a tube *c*<sup>1</sup> adapted to open at the same wall and closed at the end by a plug *k* screwing therein. The wall of the cover corresponding to the wall of the reservoir provided with the plugs *j* and *k* is furnished with slots allowing for the passage of the said plugs during the operation of the parts of the apparatus, and the plugs coming against the ends of the slots serve as stops for limiting the position of the parts *a* and *e*, in the operative and out of use positions of the device.

The kindling device for the wick comprises rollers *l* disposed one on each side of the striker *d* and flanges *m* on the outer end of each of the rollers.

The whole arrangement is adapted to rotate on the spindle *d*<sup>1</sup>. *n* are pairs of pins, of any suitable number arranged opposite one another and coming on the outside extending between the striker *d* and the flanges *m*. A device, shown detached at Fig. 13, is also provided, comprising a portion *o*, by which it can be attached to the inner surface of the cover, and another portion consisting of two resilient branches *o*<sup>1</sup> terminating in hooks *o*<sup>2</sup>. The arrangement is such that when the reservoir *a* is pushed for a certain distance into the cover *e*, at the desired moment for igniting the wick *b*, a pair of pins *n* engages the hooks *o*<sup>2</sup> so that on continuing the motion, the device with the striker turns through an angle sufficient for the production of sparks through the contact of the stone *c* with the striker, thus causing ignition of the wick in the position shown at Fig. 11. On the other hand, when the device returns to the out of use position the pins of the pair following are at the same height as the first pins when they were to be engaged by the hooks *o*<sup>2</sup>, whilst the rollers *l* force the hooks to slide over their peripheries, so that on returning to the out of use position, the said hooks pass above the pins of the next pair and come back to their position of rest ready to engage the new pins at the next operation.

In order to facilitate the combustion of the wick there may be provided in the corresponding walls of the inner member and of the cover holes *a*<sup>00</sup> and *e*<sup>00</sup>.

It has already been proposed to pro-

vide holes of this description, but in a preferred construction according to the invention and as illustrated at Fig. 9 rectangular openings *a*<sup>00</sup> may be provided adapted to come opposite the holes *e*<sup>00</sup> for some considerable distance, so that air is admitted and a carburetted mixture formed as the parts approach the striking position, an arrangement which enables a more efficient lighter to be produced than has hitherto been the case.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In an automatic ignition device or pocket lighter of the type having an inner member comprising a reservoir or carrier for combustible material, a combustion space, an outer member or cover adapted to slide over the said inner member and provided with an aperture which in one position exposes the combustion space, and with pyrophoric ignition means adapted to ignite the combustible material when the inner member and the outer cover are telescoped towards one another; a construction in which the outer cover is so shaped or cut away as to enable the parts to be slidden towards one another, but so that the outer cover extends as far as or beyond the inner member, even when the latter is in the protruded position, for the purposes set forth.

2. In an ignition device or lighter as claimed in Claim 1, a construction in which slots are provided in the outer cover through which plugs or the like screwing into the inner reservoir pass, preventing the detachment of the parts when not desired, substantially as described.

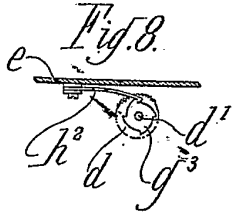
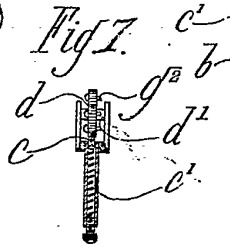
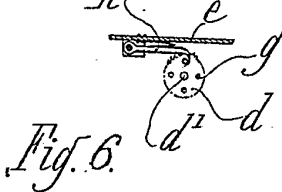
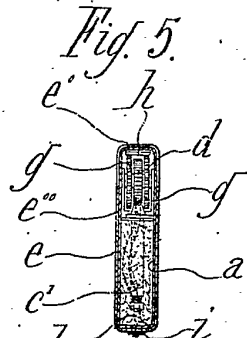
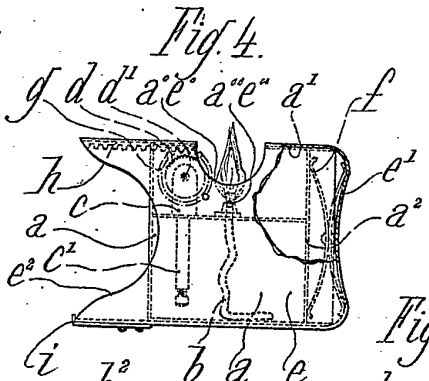
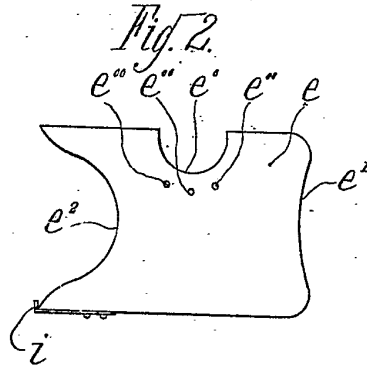
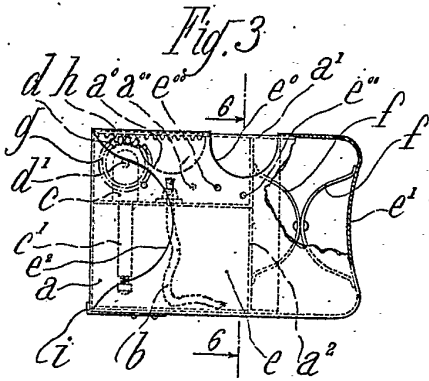
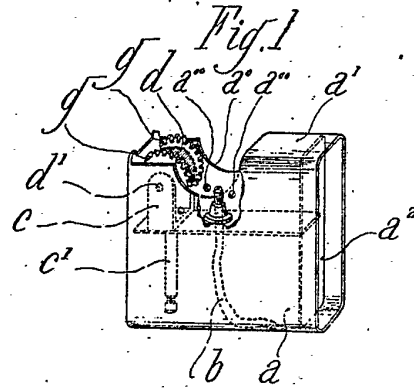
3. In an ignition device or lighter as claimed in Claim 1, striking means constructed and arranged substantially as herein described with reference to Figs. 9—13 of the accompanying drawing.

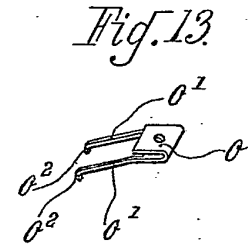
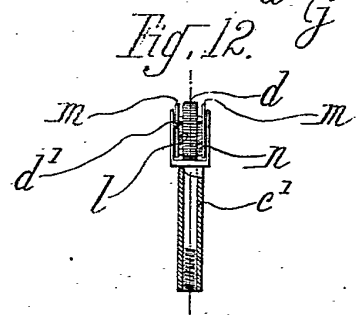
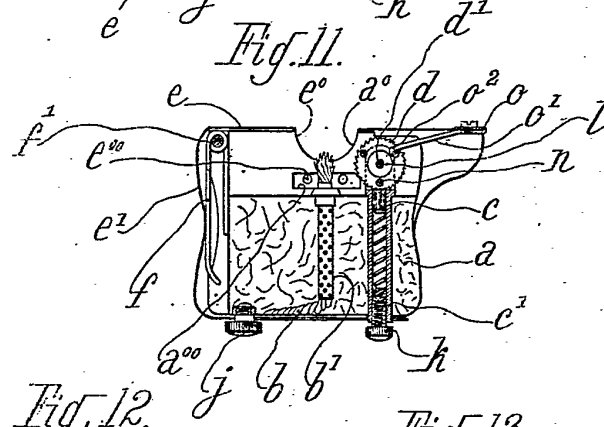
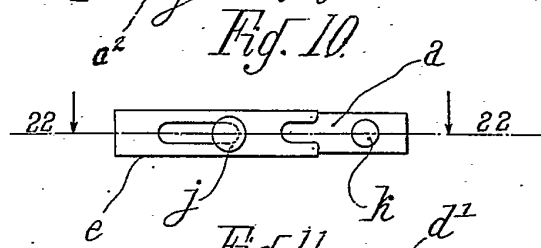
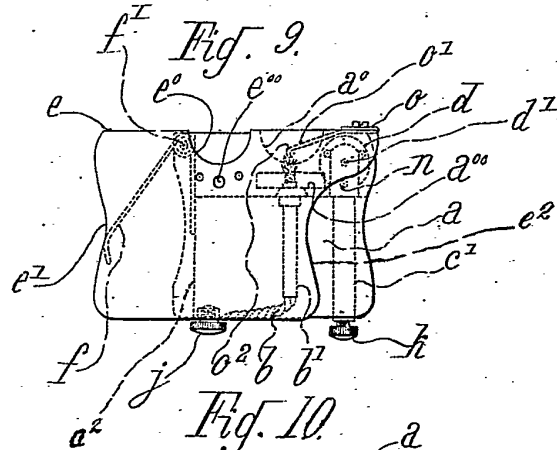
4. In an automatic lighter as claimed in Claim 1 air openings constructed and arranged in the manner herein described and as illustrated at Fig. 9, for the purposes set forth.

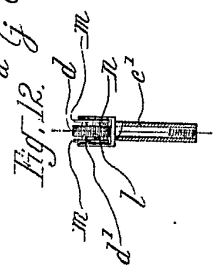
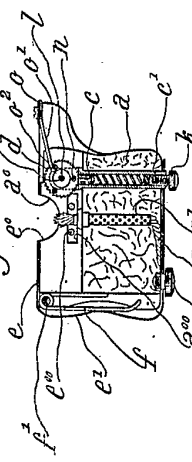
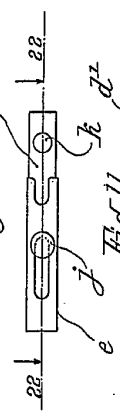
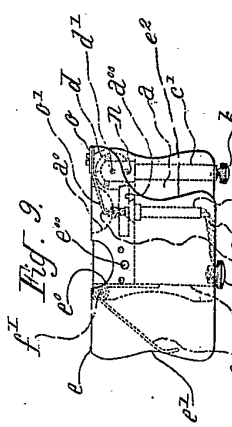
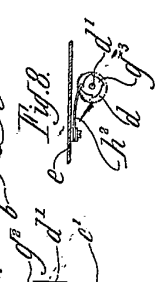
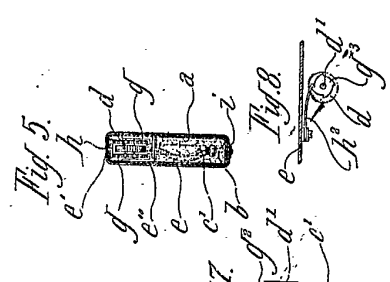
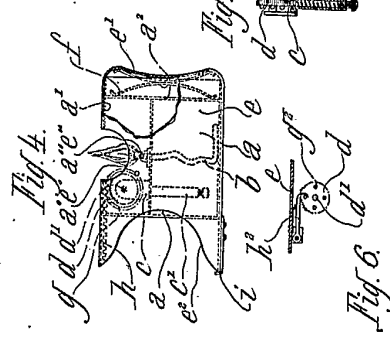
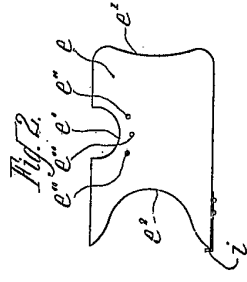
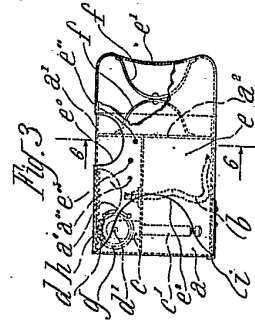
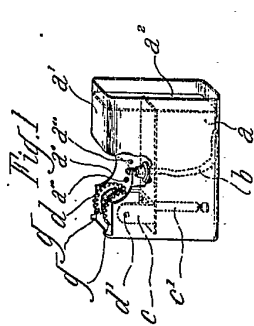
Dated this 17th day of May, 1923.

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[This Drawing is a reproduction of the Original on a reduced scale]







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