

April 8, 1930.

K. F. PROJAHN  
PYROPHORIC HAND LIGHTER

1,753,835

Filed Dec. 18, 1928

2 Sheets-Sheet 1

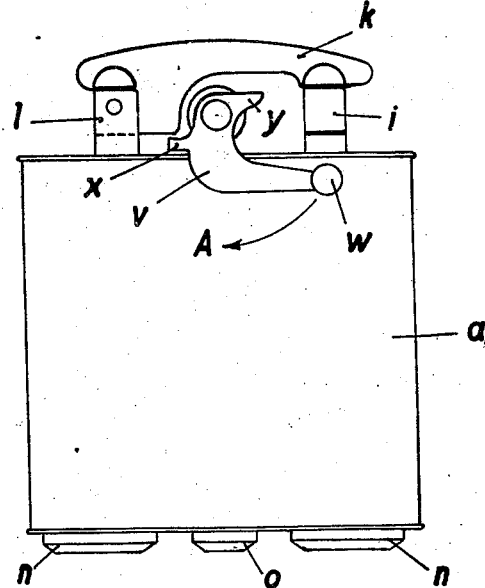


Fig. 1

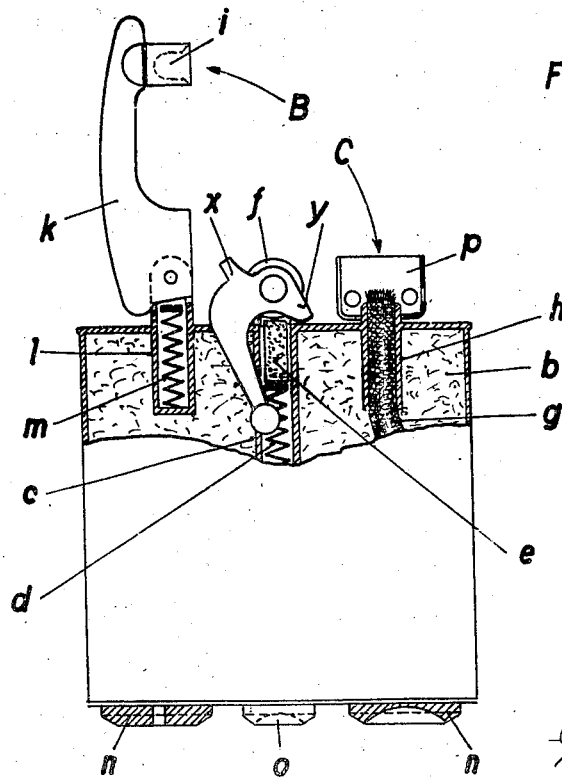


Fig. 2

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2 Sheets-Sheet 2

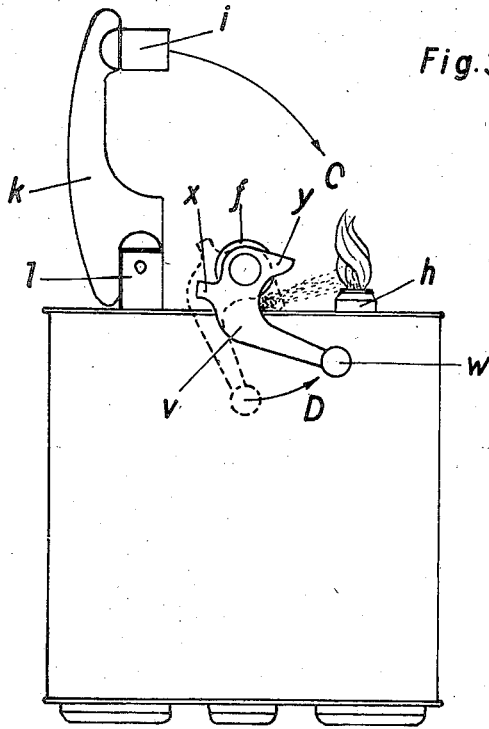


Fig. 3

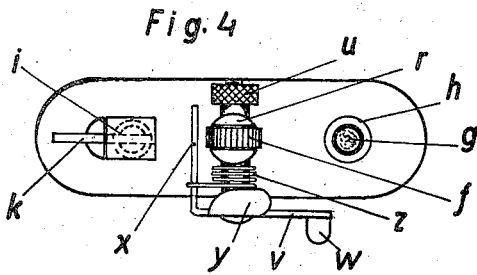


Fig. 4

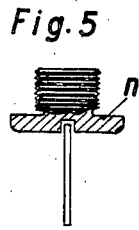


Fig. 5

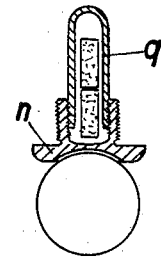


Fig. 6

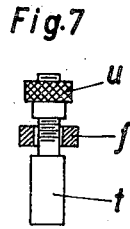


Fig. 7



Fig. 8

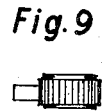


Fig. 9

Fig. 12

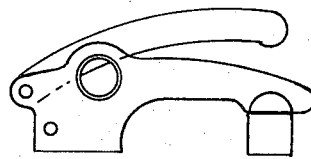


Fig. 10



Fig. 11



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# UNITED STATES PATENT OFFICE

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## PYROPHORIC HAND LIGHTER

Application filed December 18, 1928, Serial No. 326,748, and in Germany May 25, 1928.

The invention relates to lighters for lighting cigarettes and cigars, for example, and is of the type using a block or piece of pyrophoric metal and a file or friction device moving over the latter. And the object of the invention is to produce a device improved in respect of construction and convenience or ease of operation and manipulation which will appear from what is set forth herein-after and as will be apparent to those familiar with such devices.

The invention consists in whatever is described by or is included with the terms or scope of the appended claims.

In the drawings which represent very good embodiments of the invention by way of illustration,—

Fig. 1 is a side elevation of a lighter embodying the invention;

Fig. 2 is a similar view with parts in vertical section and with the movable parts in the position for producing a light;

Fig. 3 is a side elevation with the position of parts in full lines at the instant of producing a light;

Fig. 4 is a top plan view thereof;

Figs. 5 and 6 are detail views respectively of screw plugs. Fig. 6 showing the plug with a holder or container of blocks of spark-producing metal;

Fig. 7 is a detail view partly in section of the file-carrying shaft and securing means;

Figs. 8 and 9 are respectively side and top views in detail of a form of file or friction device that may be used;

Figs. 10 and 11 are respectively detail views in side elevation partly in section and in top plan view of the removable wind shield;

Fig. 12 is a detail view showing the application of a cigar cutter to a snuffer or extinguisher arm of a cigar lighter.

As usual with lighters of the description to which the invention relates, there is a flat rectangular box-like receptacle *a* adapted to hold a suitable quantity of liquid fuel and which has a lining *b* of absorbent material such as cotton, wool or the like. The bottom of the box has apertures or holes for the entrance of liquid fuel which are closed each by a screw plug *n* one of which, as shown in

detail in Fig. 6, has secured to it a shell *g* that may be a tube closed at one end whose open end is screwed into the plug for ready removal and which constitutes a storage chamber for spare or extra spark-producing pieces or flints. To avoid the necessity of using a screw-driver to remove and apply these plugs each has a slot of a size and form to receive the edge of a coin which may thus be used in lieu of a screw-driver. The slot is preferably made arcuate to best receive the edge of the coin.

As usual towards one side of the box and passing through a hole in the top thereof, is a wick-tube *h* for the usual wick *g*, and the wick-tube projects a short distance outside to receive a wind guard or shield *p* in the form of a shell or cup with a hole in the bottom to fit over the projecting portion of the wick tube and open at the top and having in the side that is placed towards the spark-producing means, presently described, a vertical slot for the passage of the sparks to the wick to ignite the same. Preferably small holes are provided near the bottom of the shield for supplying air to the wick to support combustion.

At the center of the box is located the spark-producing means that include a tube *c* that extends from the top of the box downward with its upper end open and in the upper part of which is placed the spark-producing metal or flint *e* in the usual form of an oblong block and which is engaged on its lower end within the tube by a coil spring *d* which tends to force it upward to project it in friction contact with the file or friction device, *f* mounted on the top of the box. The coil spring *d* at its lower end has a bearing which may be a removable plug *o* having a coin-engaging slot like the plugs, *n*.

The file or friction device *f* is secured to a shaft *t* mounted suitably on the top of the box so as to extend cross-wise thereof, the file being securely fixed to the shaft *t* by a clamping nut *u* shown best in Fig. 7. The shaft *t* may conveniently be mounted on the top of the box *a* by a bearing block *r* shown best in Fig. 4 which is split or divided to accommodate the file or friction device *f*.

Fixed to one end of the shaft, *t* is a crank arm or handle *v*, with a finger button *w* at one end and having at the other end an arm *x* that extends parallel with the shaft *t* across the top of the box and which is engaged by one end of a coil spring *z*, whose other end bears upon the top of the box *a*, so that when the handle *v* is moved in one direction, it will wind up or increase the tension of the spring and when the handle is released the spring acting on the arm *x* in unwinding will turn the shaft and the friction device with sufficient force and speed to produce sparks from the flint and project them to the upper end of the wick.

As is usual a snuffer for the flame and cover for the exposed upper end of the wick is provided in the form of a cap *i*. Said cap is secured to one end of an arm *k* which is pivoted on the top of the box towards the side opposite the wick, it being so pivoted to the upper end of a tubular member *l*, that is secured to the box top, so as to extend partially within and partially without the same and constitutes a holder or container for a coil spring *m* which at its outer end bears against either of two surfaces on the arm *k* at right angles and at its other end bears against the closed inner end of the tubular casing *l*. One of the surfaces on the arm against which the upper end of the spring bears, is situated with reference to the arm pivot, so that when the arm is in the wick-covering position shown in Fig. 1, the spring will hold it in such position and the other surface at right angles thereto is so situated that when the arm *k*, is in the raised position, shown in Fig. 2, the spring will hold it in that position and thus without any attention on the part of the user the arm *k* will be automatically held in each of its two positions, one for covering the top of the wick and the other for permitting the ignition of the wick and the use of the light in lighting a cigarette or cigar.

The handle arm *x* lies beneath the arm *k* when the latter is in wick-end covering position, so that when the handle *v* is pressed downward to swing in the direction of the arrow, A of Fig. 1 for the purpose of producing a light, the first effect will be to lift the arm *k* against the pressure of the spring *m* to a point where the pressure of the spring *m* will be exerted to swing the arm *k* to the fully raised position shown in Fig. 2, and when the handle *v* has been moved sufficiently far to produce the desired tension on the file operating spring *z* said handle is released, whereupon the arm *k* with the file *f* is rotated to produce the wick-igniting spark. To extinguish the light, it is necessary merely to depress the arm *k* from the raised position shown in Figs. 2 and 3 to the lower position shown in Fig. 1.

The arm *x* also serves the function of a

stop by striking the top of the box *a* when the spring has swung the handle *v* the desired extent to produce the spark. To limit the swing of the handle in the direction to wind the spring or place it under tension, the handle *v* is provided with a radial finger *y* on the opposite side of the shaft from the arm *x* so that said finger *y* will strike the top of the box *a* at the desired point in the motion of the handle to stop it.

It will be observed that the file or friction device *f* does not move through a full circle. It may conveniently, however, be made in the form of a ring or disc, but that is not necessary because it can be the segment of a circle. And if desired as shown in Figs 8 and 9, the file may have a radial extension which will lie under the arm *k* to serve the purpose of the arm *x* of the operating handle to start the arm *k* upward from wick-covering position, and said radial projection can also serve the stop function of the arm *x*.

As shown in Fig. 12, the arm which carries the wick covering cap may be made to serve as a cigar cutter by providing a hole for the insertion of the tip of the cigar and pivoting to the side of the arm *k* a knife or cutter whose cutting edge will pass across the hole and into contact with the protruding tip of the cigar.

An important advantage from the provision of the handle and spring device to rotate the file or spark-producing member, is that the thumb or finger does not have to be placed in contact with said member which besides being an inconvenient way to rotate it, is objectionable because of the soiling of the finger or thumb by contact with the smoky or sooted surface of the file. The spark-producing means in connection with the extinguishing and wick protecting device make a very simple and inexpensive construction, especially when compared with that type of construction which provides a complete lid or cover with a spring for throwing it open when a latch is released and which is operatively connected with the file wheel.

What I claim is:

1. A lighter comprising a box with sides and top, a wick-holder that exposes the wick at the top of the box, a rotary friction device, a shaft supporting said device on the top of the box and extending cross-wise thereof, a handle mounted on said shaft and extending downward adjacent the side of the box and a spring interposed between the handle and the rotary friction device acted upon by said handle when manually moved and reacting on said handle to move the friction device, said handle being situated for engagement by a finger of the hand holding the box, said handle having an arm extending across the top of the box with which said spring engages.

2. A lighter comprising a box with a top and sides, a wick at the top of the box, a spark-producing device on the top of the box, in-

cluding a rotary friction element and a shaft  
extending crosswise of the box, a handle  
mounted on said shaft extending downward  
adjacent the side of the box, a coil spring lo-  
cated between the handle and said rotary fric-  
5 tion device, the handle having an arm ex-  
tending across the top of the box with which  
said spring engages, an arm carrying a wick-  
covering cap pivoted to the top of the box,  
10 said handle arm having a portion in position  
to engage the underside of said arm to raise  
the arm when the handle is moved to wind  
the spring, a spring device extending from  
said arm adjacent its pivot downward into  
15 the box through the top thereof, said arm  
having surfaces acted on by said spring de-  
vice in alternation to hold the arm in either  
wick-covering or wick-uncovering position.

In testimony whereof I affix my signature.

20 **KARL FRIEDRICH PROJAHN.**

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