

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Pyrophoric Lighters

I, FERDINAND POPPER, of 3, Eduard Jägergasse, Vienna XIII, Austria, an Austrian citizen, 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:—

The present invention relates to pyrophoric lighters of the kind in which benzene or similarly acting split is employed.

The invention aims at eliminating the known disadvantage existing in the hitherto known lighters, which produce a spark for example by means of a friction wheel and in which a wick impregnated with benzene or the like is ignited, arising from the fact that the spark very often does not strike the wick and the friction wheel has therefore to be operated several times before a flame is produced.

The said disadvantage, which is very unpleasant even in lighters in which the wheel is operated by hand, becomes particularly inconvenient in the case of lighters operated by means of a spring controlled cap or cover, or the like, inasmuch as in this latter case the cap or cover must be closed again and caused to operate once more through the medium of the spring before the wick is at last ignited. Failures to obtain proper ignition also arise when the wick is too moist or too dry.

The invention eliminates the said disadvantage in the simplest conceivable manner and consists in a pyrophoric lighter operating with benzene or similarly acting spirit, characterised in that instead of the usual wick a sleeve-like container or chamber for the reception of fuel vapours is provided, which container or chamber is only open at the top and is lined on its internal peripheral surface with a material capable of easily absorbing the liquid fuel, the lining being kept, by means of cotton wool impregnated with fuel, moist for supplying the fuel vapours,

and sparks being thrown into the container or chamber for forming the flame. As a result of this arrangement an absolutely certain production of flame on each operation of the friction wheel is ensured either immediately when the glowing particles of the pyrophoric material fly through the combustible benzene or other vapours in the interior of the chamber, or when the sparks strike on the inner wall of the chamber which is impregnated with the fuel, the said striking place of necessity, inasmuch as the sparks are directed from above into the chamber, sweep over the cross section of the latter and cannot pass inoperatively into the open air. Reliable maintenance of a moist condition of the liner and consequently reliable formation of fuel vapours in the chamber is ensured by the provision in the lighter of a fuel container into which the vapour chamber extends, the said chamber being perforated at the lower portion thereof to enable the cotton wool therein to soak up the fuel in the said fuel container. Finally, according to the invention the often troublesome adjustment and the replacement of the wick which rapidly burns away is avoided and the re-filling of the lighter with fuel is rendered possible in the simplest manner. The burning of the liner practically does not occur at all.

A modified construction according to the invention renders it possible to apply the invention to lighters having windshields, narrow automatic lighters and the like. This is effected by making the cross section of the vapour chamber of an elongated form having any desired shape, for example oval or angular, and arranging the longitudinal axis of the cross section in the direction of the path of the spray of the sparks. This particular shape renders possible not only complete utilisation of the spray of sparks which, of course, spreads principally in

the longitudinal direction, but in addition to this it also renders possible the construction of lighters of narrow type and in particular the employment of a wind-shield. It has been found that when the vapour chamber is of circular section the wind-shield running along the narrow sides of the lighter comes so close to the vapour chamber that the flame, not yet fully formed, is extinguished again in consequence of the cooling action exerted by the wind-shield which is usually of sheet metal. When the vapour chamber is made of oval or similar shape, then, in spite of the small transverse dimension which in the small types is all that is available at the top of the lighter for the accommodation of the vapour chamber and the wind-shield, the latter is kept at a sufficient distance from the flame so that undisturbed formation of the flame is ensured and thus, in consequence of the fact that a much stronger flame is obtained than in the case of ordinary lighters, a really storm-proof lighter capable of withstanding even high gusts of wind is provided.

Preferred constructional forms according to the invention are illustrated by way of example on the accompanying drawings, in which:

Fig. 1 shows in section the simplest constructional form of lighter according to the invention,

Fig. 2 shows in elevation partly in section, a lighter according to the invention provided with a benzene container.

Fig. 3 shows a lighter according to the invention constructed as a storm-proof lighter, i.e. provided with a wind-shield, in elevation with the cap in the open position and the wind-shield in section, and Fig. 4 is a plane of Fig. 3.

In the construction shown in Fig. 1 the reference letter *a* denotes a cylindrical container which is closed at its lower part and open at its upper part, and which can be entirely closed by means of the cap or cover indicated by the reference letter *b*. The inner wall of the cylindrical container is lined with a sleeve of porous material, for example a cylindrical wick *c*, and within the interior space cotton wool is arranged as indicated at *d*. To the container the part *e* comprising the pyrophoric member or flint, the spring and the friction wheel *f* are attached through the medium of a sleeve *g*, preferably by soldering. The friction wheel is located in such a position with regard to the pyrophoric material or flint that the sparks are thrown in the direction indicated by the arrows from above at a downwardly inclined angle into the chamber *h*, which is filled with benzene

vapour.

In the constructional form shown in Fig. 2 the reference letter *q* denotes a storage container which is filled with benzene or similarly acting spirit. Within the latter there is arranged a metal cylinder *k* which is inserted from above in a fluid-tight manner and which is perforated at *t*, the said cylinder being lined at *l* with a porous material and having cotton wall *p* arranged in its interior. By this means the part *l* is reliably maintained always impregnated with combustible material and the upper chamber is maintained filled with vapour. The reference letter *n* denotes the friction wheel and the flint tube *o* is arranged in the interior of the storage container. A charging opening is provided at *s*.

It is to be understood that the invention is in no way limited to the above described two constructional examples but is adapted to be employed in various other ways and in particular in lighters having spring-controlled caps or covers, to replace the ordinary wick.

In the constructional form shown in Figs. 3 and 4 a vapour chamber having a cross section of elongated form, shown as oval in the figures, is illustrated, the said vapour chamber being indicated by the reference letter *x*. This constructional form is provided with a wind-shield *y*, the arrangement of which will be obvious from the figures.

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. A pyrophoric lighter operating with benzene or similarly acting spirit, characterised in that instead of the usual wick a sleeve-like container or chamber for the reception of fuel vapours is provided, which container or chamber is only open at the top and is lined on its internal peripheral surface with a material capable of easily absorbing the liquid fuel, the lining being kept, by means of cotton wool impregnated with fuel, moist for supplying the fuel vapours, and sparks being thrown into the container or chamber for forming the flame.

2. A pyrophoric lighter operating with benzene or similarly acting spirit, according to claim 1, characterised in that the cross section of the vapour chamber is of elongated form of any desired shape, which may be angular but is preferably oval, the longitudinal axis of the cross section lying in the direction of the path of the spray of sparks.

3. A pyrophoric lighter, according to claims 1 and 2, characterised in that the

tubular vapour container is built into a fuel container in such a manner that the liner of the said vapour container is maintained constantly impregnated with fuel.

4. A pyrophoric lighter, according to claim 1, characterised in that the tubular container is adapted to be closed fluid-tightly by means of a cover or cap which is constructed so as to fit exactly and

which rests on a shoulder.

5. Pyrophoric lighters operating with benzene or similarly acting spirit, substantially as described.

Dated the 17th day of September, 1936.

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

Fig. 1.

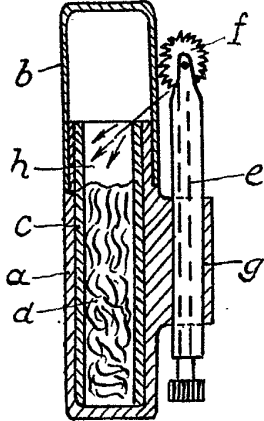


Fig. 2.

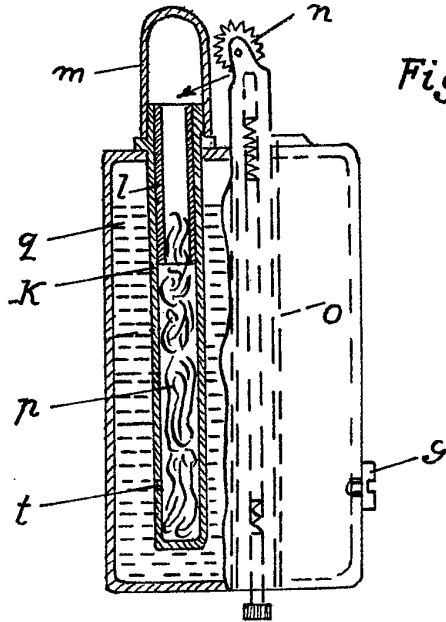


Fig. 3.

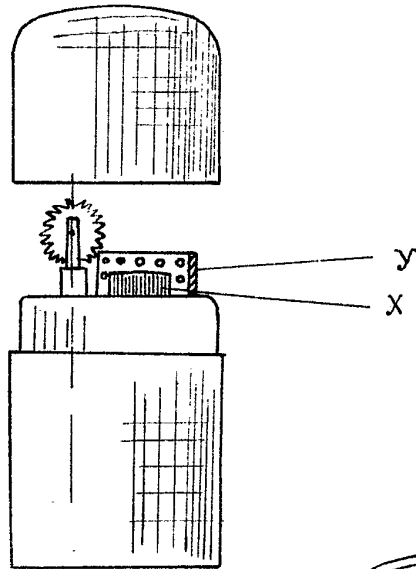


Fig. 4.

