

# PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

## Pyrophoric Ignition Devices.



I, HANS SILBERKNOPF, a Citizen of the Republic of Austria, of 123, Geblergasse, Vienna XVII, Austria, 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 improvements in pyrophoric ignition devices of the type in which a lever, carrying the wick-cap, is operated simultaneously with the small friction-wheel by means of a gear, or in which this lever is coupled to a finger which is adapted to rotate the small friction wheel in order to operate the ignition device. In these known ignition devices the angular movement of the wick-cap is the same as that of the friction-wheel, and therefore the sparks fly at a time when the wick-cap is not sufficiently lifted from the wick-tube. In spite of a complicated construction, the wick-cap had to be returned into the initial position by the aid of both hands after each operation.

According to the present invention, these drawbacks are removed in that ratio members are disposed between the friction wheel and the wick-cap, which multiply the angle of movement of the wick-cap with respect to that of the friction-wheel to an extent corresponding to the chosen ratio. The ignition device can be used with one hand only, because all parts are automatically brought into the initial position by the action of a spring.

Two modes of carrying out the present invention are illustrated by way of example on the accompanying sheet of drawings in which—

Figures 1 and 2 show a pyrophoric ignition device with the wick-cap in the closed position and open position respectively.

Figures 3 and 4 illustrate in front view and plan view respectively a modified construction of a pyrophoric ignition device with the wick-cap in the open position.

Figure 5 is a detail view in section.

The pyrophoric ignition device comprises in known manner a benzine-vessel

[Price 1/-]

*b*, provided with a wick-tube *a* and to which is pivotally secured a single armed lever *e* by means of a pivot *d*, which is disposed opposite the small friction-wheel *c*. The free end of the lever *e* is formed with a wick-cap *f* and preferably is subjected to the action of a spring *g* (Figure 2), which is wound round the pivot *d* and rests on the benzine-vessel *b*, the said spring having the tendency to rotate clockwise the lever *e* and thus the wick-cap *f* tightly encloses the wick-tube *a*. A bell crank lever *i, k* is mounted so as to be freely rotatable on the shaft *h* of the friction wheel *c*, the lever-arm *i* which is directed upward at an incline embracing the said wheel in the manner of a bracket and may be employed to impart rotation to the said friction wheel. The free end of the other longer lever arm *k* which is directed downward is connected with the lever *e* by means of pivoted links *l* attached in the neighbourhood of the pivot *d*. On operating the bell crank lever, a stop *m*, provided on the lever arm *i*, co-acts with the guide-sleeve *n* of the ignition stone and thus limits the rotation of the bell crank lever *i, k* and of the lever *e* respectively.

The device operates in the following manner:

If it is desired to use the ignition device, the thumb of the hand is placed in known manner on the free or uncovered part of the friction wheel *c* above the lever arm *i*, and now the friction wheel is operated as usual, whereby the bell crank lever *i, k* is rotated clockwise. The rotation of the bell crank lever *i, k* causes the lever *e*, connected with it by means of the links *l*, to rotate in the opposite direction or anti-clockwise. According to the chosen ratio, the angle of rotation of the lever *e* is a multiple of the angle of rotation passed through by the friction wheel. Owing to the difference of these angles, during the sparking the wick-cap *f* is lifted off of the wick-tube *a* in sufficient time to enable the sparks positively to ignite the wick. The stop *m* striking the guide-sleeve *n* prevents the lever *e* rotating beyond a position parallel to the wick-tube *a*. After the lever-arm *i* is

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released, all parts return into the initial position by the action of the spring *g*.

The pyrophoric ignition device illustrated in Figures 3, 4 and 5 differs from the embodiment above described in that the spring *g* is replaced by a plate-spring *o*, which rests on the benzine-vessel *b* and co-operates with the end *p* of the lever *e*, extending beyond the pin *d* and formed eccentrically with respect to the same. As soon as the lever *e* is disposed parallel with respect to the wick-tube *a* during the operation of the ignition device, the plate-spring *o* operates against the turned-up end *p* of the lever and thus holds the lever *e* in its open position (Figure 5). In order to shut the wick-cap *f* it is necessary only to rotate clockwise the lever *e* to such an extent against the force of the plate-spring *o*, that the front face of the lever-end *p* co-operates with the plate-spring *o*, when the lever *e* is completely turned down automatically.

It is to be remarked that the lever arm *i* can engage the friction wheel *c*, constructed as ratchet-wheel, by means of a pawl, whereby it is not necessary that the thumb of the hand directly touches the sharp-edged friction wheel.

If the links *l* are formed as flat extended surfaces, a wind protection is formed, which is closed up at its narrow sides by the lever *e* and by the guide-sleeve *n*, as well as by the friction-wheel *c*.

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. Pyrophoric ignition device of the type referred to, characterised by the fact that ratio members are disposed between the friction wheel and the wick-cap, which multiply the angle of movement of

the wick-cap with respect to that of the friction wheel. 45

2. Pyrophoric ignition device as claimed in Claim 1, in which the axes of rotation of the wick-cap and the friction wheel are arranged at opposite sides of the wick tube. 50

3. Pyrophoric ignition device as claimed in Claims 1 and 2, in which the ratio members consist of a link, for example, (*l*) connecting a lever (*k*) adapted to be operated in accordance with the movement of the friction wheel and a lever (*e*) carrying the wickcap. 55

4. Pyrophoric ignition device as claimed in Claims 1, 2 or 3 and in which during the open position the wick cap is subjected to the action of a closing spring, which after the use of the ignition device automatically returns all parts into the initial position and causes a tight closure of the wick tube by depressing the wick cap. 60

5. Pyrophoric ignition device as claimed in Claims 1, 2 or 3, in which links (*l*), connecting the wick-cap with a lever (*k*) at both sides of the wick-tube, are formed as extended surfaces and together with the open wick-cap and the friction wheel as well as the ignition stone sleeve form a wind protection cover. 65

6. Pyrophoric ignition device constructed, arranged and adapted to operate substantially as described and illustrated. 75

Dated this 10th day of April, 1928.

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[This Drawing is a full-size reproduction of the Original.]

