

N<sup>o</sup> 26,543



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COMPLETE SPECIFICATION.

Improvements in Pocket Lighting Appliances using Pyrophoric Metal.

I, GEORG FRIEDRICH HOFMANN, of 57/59, Bayerstrasse, Munich, in the Kingdom of Bavaria, in the Empire of Germany, Manufacturer, 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 pocket lighting appliances of the type in which a flame is ignited by friction on pyrophoric metal. The invention relates more particularly to such a form and arrangement of the constituents necessary for producing a spark, that these parts may be themselves put together without soldering and in this assembled form inserted in a case. This is of great advantage for the cheap wholesale manufacture of the lighting appliance, as the separate parts may be produced independently in large quantities by pressing, stamping and the like, and assembled without difficulty. The assembling is also facilitated, since the case itself, which may be made by pressing or drawing is difficult of access. The changing of the separate constituents is also much facilitated.

In connection with the general arrangement of the device whereby the parts are made more readily accessible provision is also made in known manner for raising the lever which presses on the pyrophoric metal when it is wished to replace the latter. These means consist of apertures in the sides of the lid below the lever in question through which a pin or the like may be passed so that when the lid is raised the lever is lifted with it.

A further object of this invention consists in an improved formation of the coupling between the operating tooth wheel and the friction wheel. The coupling most generally used is a lateral clutch coupling. As in this arrangement the teeth by frequent use are rapidly worn away and the coupling ceases to act, by this invention the clutch coupling is replaced by a ratchet coupling.

Several examples of construction of the invention are shown in the accompanying drawings, in which:—

Figure 1 is a vertical longitudinal section of one form of construction of the pocket lighting appliance seen from one side; and

Figure 2, a view from the other side of the parts of the lighting appliance removed from the case;

Figure 3 is a vertical section of a second form of construction of the pocket lighting appliance;

Figure 4, a side view of the parts removed from the case, in a third form of construction;

Figure 5, a side view of a fourth form of construction in section through a part of the case;

Figures 6 and 7 show different shapes and arrangements of the spring closing the lid;

Figure 8 is a longitudinal section; and

Figure 9, a cross section of the coupling;

Figure 10, a longitudinal section of another form of construction of the coupling; and

Figure 11, a plan view of the friction wheel belonging thereto.

[Price 8d.]



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A frame formed of two side plates 2 with an under crossbar 3 is removably mounted in the upper part of a case 1 (Figure 1) formed in one piece, which frame has on one side a socket or holder 4 for the reception of the pyrophoric metal (Figures 1 and 2). Between the plates a friction wheel 5, and a toothed wheel 6 are mounted, on which latter a toothed sector 8 mounted on the lid 7, acts. In similar manner this lid and also a lever 9 which pushes forward the pyrophoric metal are pivotally mounted between the plates 2. Beneath the frame there is located a removable fuel container 10 with a filling aperture at the bottom which may be kept closed by means of a closing screw 11. The filling aperture has an annular neck 12 which projects through the case.

The frame composed of the plates 2 is fixed at one end by means of projections 13 arranged on the plates fitting into apertures of the case 1. The wick tube 14 projects through a round aperture in the centre bar 3 between the plates. In order to secure the plates 2 at their other end, a projection 16 mounted on a V-shaped spring 15 is employed, which engages over the crossbar 3 of the plates. This spring has a press stud or knob 17 and is thus secured against dropping out by the opening of the case 1 through which the press stud projects. The press stud thus secures by means of the projection 16 of the spring 15, the plates 2 in their position. If the press stud 17 be moved back so far that it comes out of the opening, the spring 15 may be easily withdrawn, so that the frame is also released and may be removed.

By the arrangement hereinbefore described the possibility is thus afforded of assembling the separate constituents of the pocket lighting appliance outside the case in the simplest manner without soldering (with the exception of the fuel container), whereby the manufacture is substantially simplified and cheapened. The fuel container may also be easily soldered without trouble, as it may be made independently of the case, which latter is stamped out in one piece. It is also possible to easily and rapidly change worn or defective parts of the pocket lighting appliance.

In order to be able to easily raise the pressure lever 9 to allow of a fresh piece of pyrophoric metal being inserted in the holder or socket 4 and thus to expose the latter, an aperture 18 is provided in each side of the lid somewhat below the lever 9 (when the lid is shut) through which apertures a pin or spike may be passed. On the opening of the lid the lever 9 is thus simultaneously lifted by the pin, so that a fresh piece of pyrophoric metal may be inserted in the holder, without it being necessary to take any other parts apart for this purpose.

Instead of securing the frame by the projections 13 (according to Figures 1 and 2), in the forms of construction shown in Figures 3 to 5 downwardly extending projections 19 are provided on the plates 2, which projections in the examples of construction shown are formed like tongues, but may also be of any other suitable form. The tongue-shaped projection suitably engages between the wall of the case and the fuel container 10, whereby the frame and the fuel container are maintained in their positions. The frame is held by the hooked projection 16 of the closing spring 15 (see Figure 3). By withdrawing the closing spring, the constituents of the lighting appliance contained in the lower case 1 are released.

In the form of construction shown in Figure 3 the tongue 19 is placed at the rear of the lighting appliance, but it may also be arranged, as shown in Figure 4, at the front. In similar manner two tongues—one at the front and one at the rear—may be provided on the plates 2, as shown in Figure 5.

In order not to attach the lid 7 directly to the plates 2 by means of a hinge, it is fixed by means of a screw 21 to a frame bent round at right angles. The frame is connected with the plates by means of a hinge 22. The front end of the frame 20 is turned up a little, so that the frame rests on the inside of the lid with a spring action and cannot rattle therein.

Instead of the V-shaped spring shown in Figures 1, 2 and 6, the spring shown in Figures 5 and 7 may be employed, which consists of only one leaf 23

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and a press stud 24. This blade or leaf is inserted with its lower end, which is preferably nicked from both sides, between forked projections 25 on the lower end of the front tongue 19. The desired springiness of the blade 23 is obtained by lugs 26 which are mounted on the tongue 19 and engage behind the leaf spring 23.

The following arrangement is adapted for tightly closing the wick tube: A displaceable sleeve or socket 28 is provided in the closing cap 27. A spring 29 is mounted behind this sleeve, so that when the lid is closed, the sleeve 28 is pressed elastically against the ordinary elastic ring 30, which surrounds the wick tube. The spring 29 preferably embraces the upper narrowed end of the sleeve 28, and its other end is passed through the cap 27 and the frame 20 and rivetted behind them, so that the attachment of the cap 27 and the sleeve 28 to the yoke is thereby obtained.

A ratchet tooth 33 on which a spring 34 acts from beneath, is provided for coupling the toothed wheel 6 with the friction wheel 5 in a radial perforation 32 of a hub 31 mounted on the toothed wheel 6. This ratchet may engage with suitable tooth intervals 35 on the inner side of the friction wheel 5 (Figures 2, 8 and 9). On opening the lid 7, the toothed wheel 6 on rotating is coupled with the friction wheel 5, which thus produces the spark, whilst on closing the lid no coupling takes place.

In the coupling shown in Figures 10 and 11, instead of the ratchet tooth 33 a springy metal band 36 is wound round the hub 31 in a suitably wide groove, one end 37 of which band engages in a slot in the hub 31. The other free end 38 of the spring band 36 is bent up a little so that it can elastically engage in the tooth intervals 35 of the friction wheel.

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 a pocket fire or lighting appliance with pyrophoric metal of the type in which a friction wheel for forming the spark is set in rotation by the lid springing up, the construction in which the whole arrangement employed for forming the spark together with its operating mechanism, is mounted in a separate metal frame and removably attached with this in the case, substantially as described.

2. A form of construction of the pocket lighting appliance as in Claim 1, in which the frame is composed of two side plates which are fixed in the case on the one hand by projections engaging in recesses and on the other hand by a projection which is arranged on the end of a V-shaped spring carrying the press stud for opening the lid, so that when this spring is removed and the press stud is pushed back, the frame and fuel container may be removed from the case, substantially as described.

3. A form of construction of the pocket lighting appliance as in Claims 1 and 2, in which suitable downwardly extending projections are provided on the front and back of the plates of the frame, which projections fit into spaces respectively between the wall of the case and the fuel container, substantially as described.

4. A form of construction of the pocket lighting appliance as in Claims 1 and 3, in which a leaf spring is engaged between the inwardly bent round forked ends of the front projections of the plates, which spring in order to obtain resiliency bears against lugs on the projections of the plates and also holds by means of the press stud the frame in the case of the lighting appliance, substantially as described.

5. A form of construction of the pocket lighting appliance as in Claims 1, 3 and 4, in which a frame is linked to the plates for fastening the lid, to which frame the lid is secured by means of a screw or the like, substantially as described.

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6. A form of construction of the pocket fire appliance as in Claim 1, in which a socket or sleeve adapted to be displaced by the action of a spring is provided for tightly closing the wick tube in the closing cap, which sleeve bears with its lower end against an elastic ring surrounding the wick tube, substantially as described. 5

7. A form of construction of the pocket fire appliance as in Claims 1 and 6, in which one end of the displaceable sleeve is connected with a spiral spring, the other end of which is passed through the cap and the wall of the lid or the frame and rivetted thereto, substantially as described.

8. A form of construction of the pocket lighting appliance as in Claim 1, in which apertures, through which a pin or the like may be passed, are provided in the sides of the lid below the lever for pressing on the pyrophoric metal, in order that when the lid is raised the lever for pressing on the pyrophoric metal may also be raised for the purpose of replacing the latter, substantially as described. 10 15

9. A pocket lighting appliance with pyrophoric metal of the type having a coupling between the friction wheel and a toothed wheel operated by means of a sector on the lid, in which a ratchet tooth, which is under the action of a spring, is displaceably mounted transversely in the hub of one wheel on which the other wheel is revolubly mounted, which ratchet tooth may engage in suitable tooth intervals in the interior of the other wheel, so that this latter in one direction of rotation is coupled with the first wheel, substantially as described. 20

10. A form of construction of the pocket lighting appliance as in Claim 9, in which the ratchet pawl consists of a springy strip of metal laid round the bearing pin of the wheel to be coupled, the free somewhat bent up end of which strip engages with the inner teeth of the wheel to be coupled, substantially as described. 25

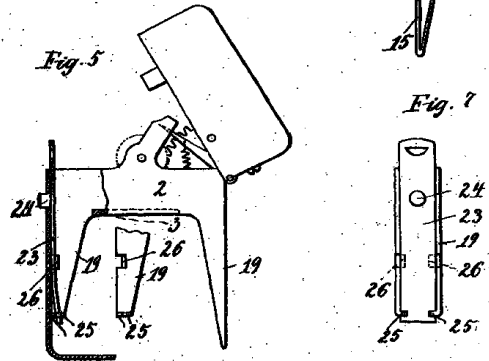
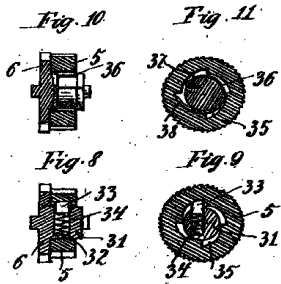
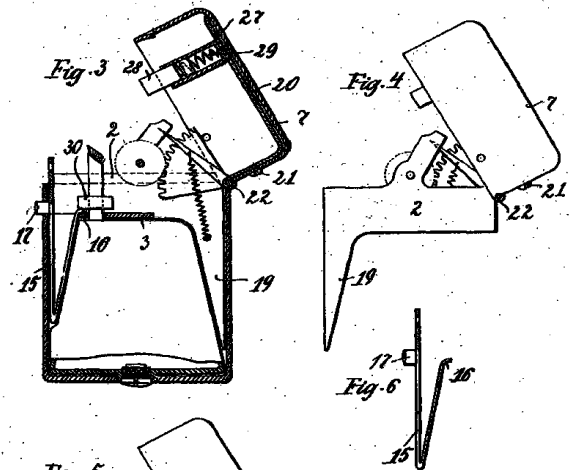
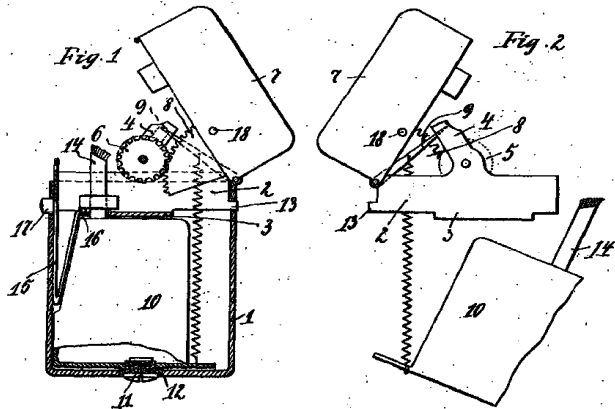
Dated this 14th day of November, 1910.

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SHEET 1.

SHEET 2.

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



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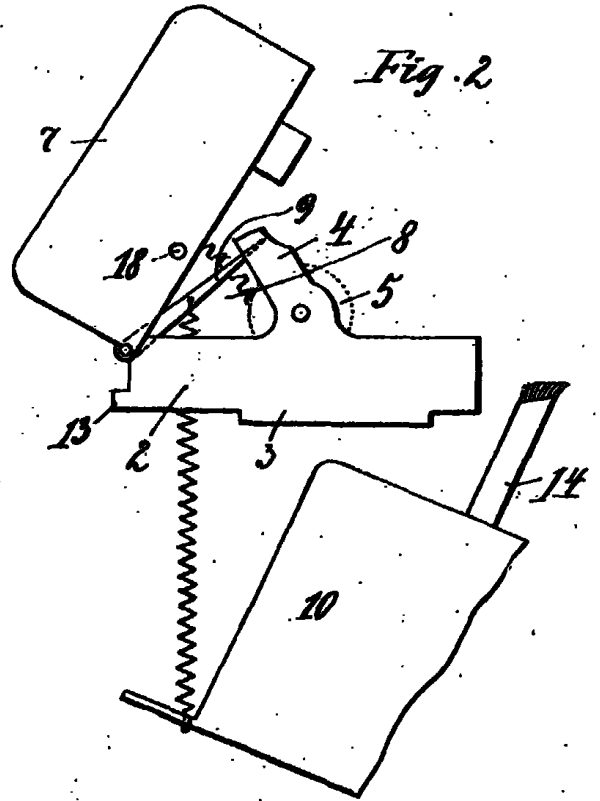
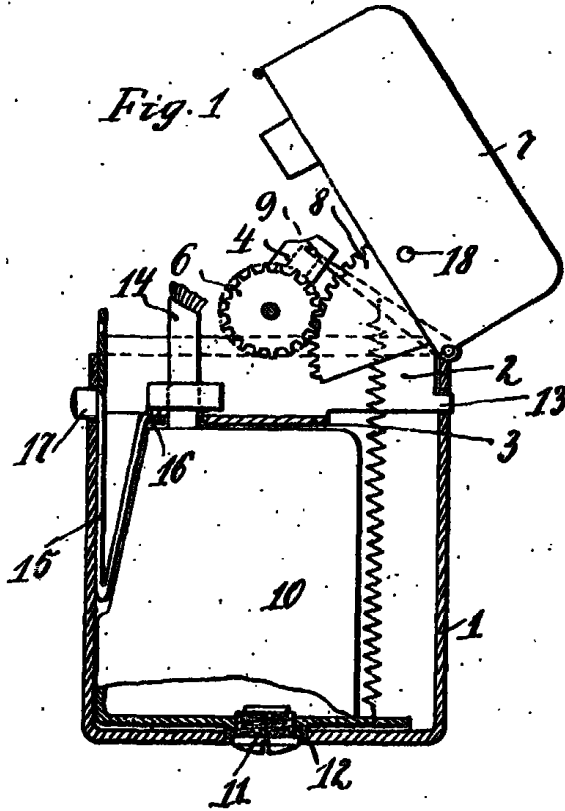


Fig. 10

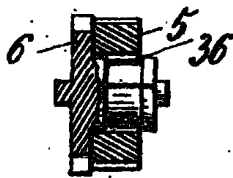


Fig. 11

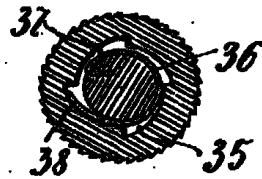


Fig. 8

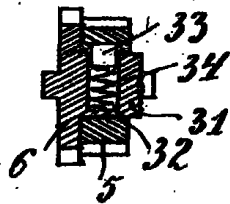
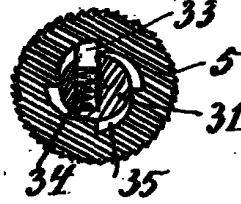
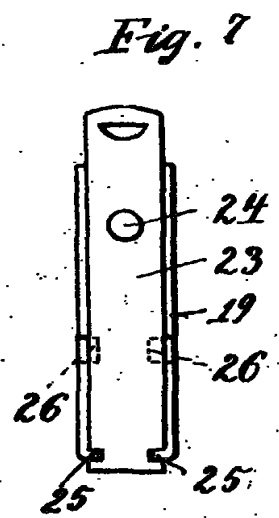
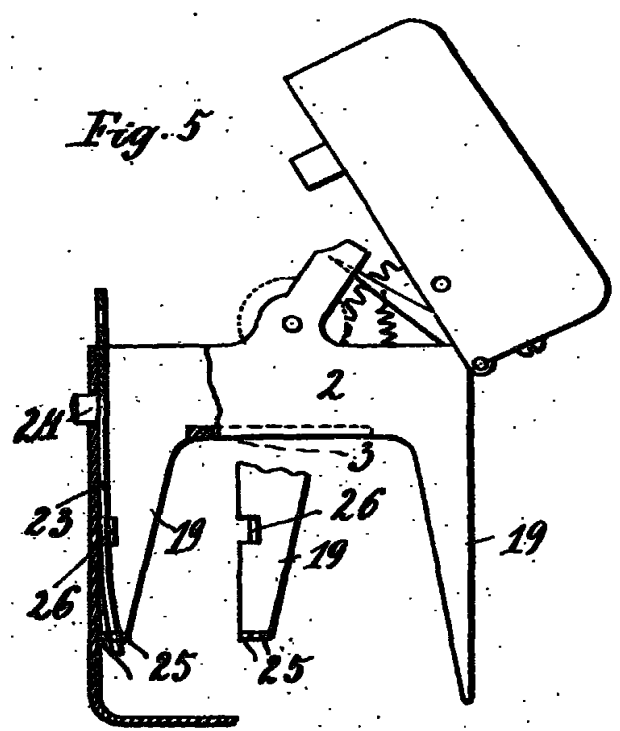
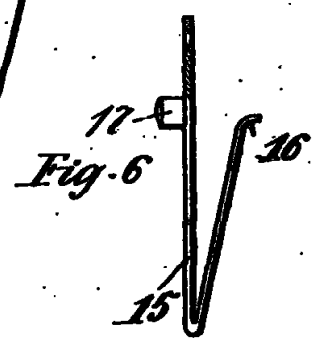
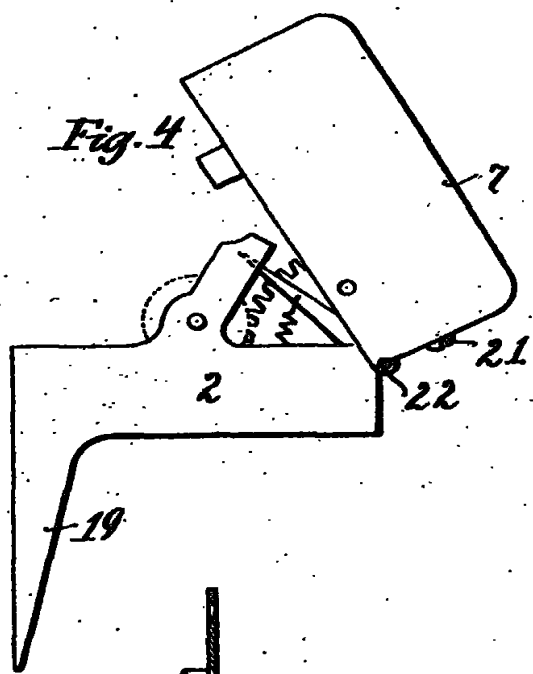
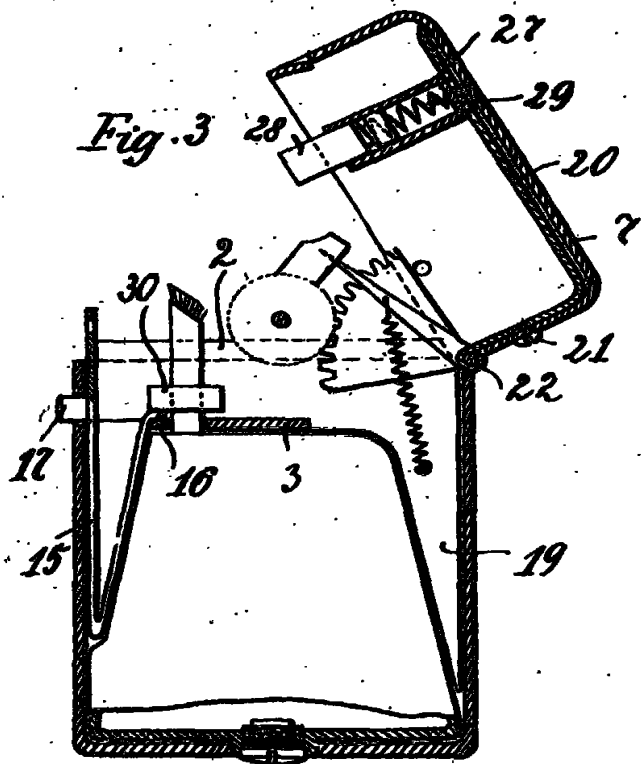


Fig. 9





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