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(Under this application, which was originally made under Section 91 of the Patents and Designs Acts, 1907 to 1928, a specification was laid open to public inspection on March 27th, 1930.

PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

An Improved Friction-wheel Lighter using Solid Fuel.

I, ALFRED RUDOLF HOCHSTRASSER, a citizen of the Swiss Republic, of Tuchlaubenhof 7a, Wien 1., 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 a friction-wheel lighter using solid fuel which is superficially disintegrated by means of a scraping device and ignited by sparks produced by the friction-wheel, and consists in the employment of a flexible means of scraping which is capable of adapting itself to the shape of the end of the body of solid fuel in the lighter, and against which the said body of fuel is pressed by means of a spring. For this purpose a fine grating formed of wire gauze or of pliable perforated sheet metal is most suitable. The invention is further characterized by the particular manner in which the flexible scraping means and the body of solid fuel are independently movable in relation to each other, and by the particular manner in which the scraping means is mounted and actuated. Further objects and features of the invention will become apparent in the course of the description.

The arrangement of a flexible means of scraping more or less embracing the end of the body of solid fuel in accordance with the present invention has the advantage over the hitherto known devices of a similar kind, in which the loosening of the uppermost layer of the body of fuel is performed by a rigid means of scarification such as an arrangement of needles, a rake or the like, that the permanent intimate contact between the scraping means and the fuel enables the entire surface of the fuel to be uniformly pulverised by a comparatively slight relative movement between the scraping means and the body of fuel. The fine powder thus evenly produced and distributed over

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the surface of the fuel is more easily ignited by the sparks produced from the cerium iron by the friction-wheel of the igniter than the coarse particles detached from the solid fuel by the known types of rigid scraping devices. The employment of a grating as flexible scraping means provides the further advantage that the fuel during burning can be kept pressed by means of a spring against the grating, so that the device is permanently automatically ready for use, and the slightest relative movement between the grating and the fuel is instantly effective in pulverizing the surface of the fuel. Furthermore the grating causes the powder produced to remain in intimate contact with the surface of the body of fuel, thus ensuring rapid and certain ignition.

Several forms of construction embodying the invention are shown in the drawings, in which Figs. 1 and 2 illustrate diagrammatically two examples of the association of a flexible means of scraping with a body of solid fuel, the igniting device proper being omitted, while Figs. 3 to 6 show various methods, by way of example, of mounting and actuating the scraping means, each figure representing a section of a complete lighter.

The fuel *a* (so-called solid spirit or the like) is contained in a tubular compartment 1 within the casing of the lighter, and is pressed outwards by a spring 2 against the flexible scraping means 3, which adapts itself to the shape of the surface of the fuel and is movable in relation to the body of fuel in any desired manner. As flexible scraping means it is desirable to employ fine wire gauze or pliable perforated sheet metal, which, as shown in Fig. 1 is caused to move in the directions of the two arrows I and II across the surface of the fuel so that, in consequence of the pressure exerted by the spring 2 tending to press the fuel against the scraping means, the soft surface of the fuel is reduced to a floury powder, which exudes through the meshes of the scraping

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grating or grid and is easily ignited by the sparks from a cerium iron igniting device, the flame thus produced then igniting the surface of the fuel α immediately beneath the grid. As shown in Fig. 2 the grid 3 can be stretched and secured over the upper rim of a covering shell or capsule 1' and the solid fuel held in the inner capsule 1 in such a manner that it is locked against independent rotation but can be rotated by hand together with the capsule 1 and under pressure of a spring against the grid. In this case also the surface of the fuel will be loosened in the required manner, since only relative movement between the scraping means and the fuel coupled with pressure exerted by a spring tending to maintain these two elements of the device in permanent contact is necessary for effecting this loosening of the surface of the fuel. In Figs. 3 to 6 four examples of forms of construction for the device according to the invention are shown in sections of complete lighters. In the form shown in Fig. 3 the scraping grid 3 is firmly held between the two stationary points 4 and 5 on the casing 6, and the solid fuel α is contained in a retaining capsule 1, which is capable of oscillating about a pivot 7, a leaf spring 8 tending to force the capsule 1 into the position shown in Fig. 3. A stop pin 9 attached to the capsule 1 co-operates with a plate 10 attached to the lid 11 of the casing in such a manner that, when the lid of the lighter is closed, the capsule 1 containing the fuel is pressed into the vertical position against the action of the spring 8. When the lid 11 of the lighter is opened by pressure on the button 12 the spring 8 causes the capsule 1 to be tilted back from the upright position in which the fuel α is in the position shown in broken lines into the position in which it is shown in full lines in Fig. 3, whereby the fuel α is pressed by the spring 2 against the grid 3, so that the surface of the fuel is finely grated and the fuel dust thus formed is pressed through the meshes of the grid, whereupon it is ignited by the sparks generated by the co-operation of the jagged wheel 13 with a stick of cerium iron.

In the modified construction shown in Fig. 4 the grid 3 is secured to a ring 14 and is cup-shaped. The ring 14 is pivotted so that it can be tilted by the opening of the lid 11 of the lighter, whereby the block of fuel α , which is in this case stationary and pressed by the spring 2 against the grid, is superficially roughened in the manner described. The ring 14 can also be replaced by a double armed lever more or less adapted to the shape of the block of fuel. A toothed segment

15 attached to the lid 11 served for the tilting of the grid by engaging in a pinion 16 connected to the ring or lever 14. The casing 6, which is closed on the under side by a cover 6', contains a storage space for spare fuel α .

In the form of construction shown in Fig. 5 both operations—the movement of the grid 3 and the ignition of the fuel dust—are automatically effected by the opening of the lid 11 of the lighter. The opening of the lid first liberates the catch 17, which holds the lever 18 together with the grid 3 attached thereto against the tension of the spring 19, so that the grid is again tilted as in the example shown in Fig. 4, while the further movement of the lid 11 in opening rotates the jagged wheel 13 by means of the toothed segment 20, as in the ordinary cerium iron gas-line-lighters already known to commerce.

In the example of a form of construction shown in Fig. 6 the grid 3 is rigidly attached at one point 21 to the casing, and at the opposite side to a button 22 projecting through a slit in the casing 6. The button 22 can be moved in the direction shown by the arrows in the drawing by means of the finger or thumb, and effects the movement of the grid 3 across the end of the block of fuel, which is at the same time pressed down to the necessary extent against the action of the spring 2. For the purpose of retaining the tension of the spring 2 adjusting devices can be provided in the casing 6, by means of which the consumption of the fuel and consequent relaxation of the spring 2 can be compensated for.

The precise manner in which the relative movement between the grid 3 and the solid fuel α is brought about is immaterial, and the forms of construction shown in the drawings are intended to serve merely as examples of possible modifications. For the purpose of carrying out the invention the grid 3 can be made of uniform strands (e.g. steel wire) or of thin sheet metal, or of other material interwoven with thin steel wire. The separate strands of the grid can also be provided with rasping teeth on the under side, so that in fine the term "grid" as herein employed is intended to cover all flexible means capable of scraping the surface of the solid fuel in such a manner that a powder is formed therefrom, and of permitting the powder thus formed to pass through the perforations or meshes of the said means. The grid also need not cover the entire surface of the block of fuel, but can be so arranged as to form contact with a portion thereof only. Further in place of the reciprocating or to and fro movement of 130

the grid hitherto described an endless strip of the grating material described could for instance be employed and be arranged to be fed forward in one direction for a certain distance across the face of the block of fuel each time the lighter is used.

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 friction-wheel lighter with a block of solid fuel acted upon by a spring and a scraping implement for loosening the surface of the fuel, characterized in that the scraping implement consists of a flexible grating means, which embraces the end of the block of fuel and at the same time acts as a stop to the latter against the action of the spring.

2. A friction-wheel lighter according to Claim 1, characterized in that the flexible grating means is in the form of a grid.

3. A friction-wheel lighter according to Claim 1, characterized in that the flexible grating means is movably mounted

so that it can be moved across the surface of the stationary block of fuel.

4. A friction-wheel lighter according to Claim 1, characterized in that the block of fuel is held in a capsule which is movably mounted, so that the fuel can be moved across the under surface of the stationary flexible grating means.

5. A friction-wheel lighter according to Claim 1, characterized in that the flexible grating means is rigidly secured at one end to the casing of the lighter, while the other end thereof is mounted in such a manner as to be movable.

6. A friction-wheel lighter according to Claim 1, characterized by the provision of a readjusting device for the tension of the spring acting upon the block of fuel.

7. A combination of parts comprising a complete friction-wheel lighter for use in connection with solid fuel, all constructed, arranged, and adapted to operate substantially as herein described with reference to and as illustrated in the accompanying drawings.

Dated this 26th day of March, 1930
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[This Drawing is a reproduction of the Original on a reduced scale.]

