June 8, 1948. P. O. SOLON 2,443,123

CUTTING WHEEL FOR FLINT IGNITERS

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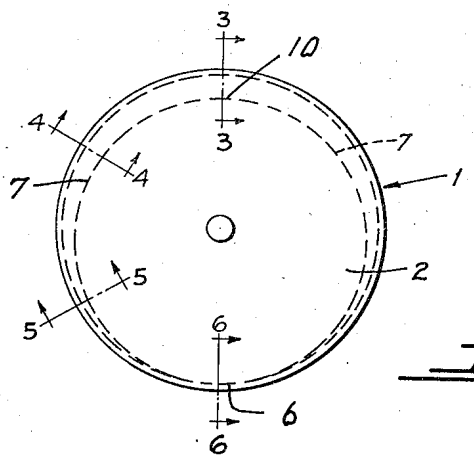

Fig. 1

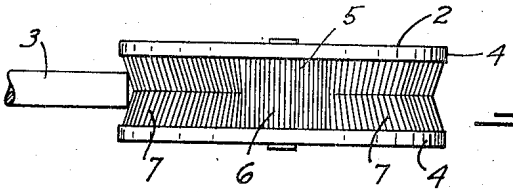

Fig. 2

Fig. 3

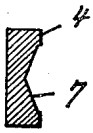

Fig. 4

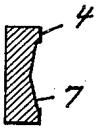

Fig. 5

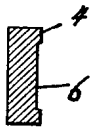

Fig. 6

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CUTTING WHEEL FOR FLINT IGNITERS

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3 Claims. (Cl. 67—4.1)

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The present invention relates to improvements in cutting wheels for flint igniters, and its principal object is to provide a cutting wheel with a novel striking surface shaped for more effective cooperation with the flint for producing a spark and for maintaining the striking end of the flint in effective condition.

More particularly it is proposed to provide the improvements in connection with a flint igniter commonly employed in cigarette lighters, although it may be used for other purposes.

In igniters of this type it is common practice to provide a rotary wheel with a cylindrical abrasive surface and a flint in the form of a cylindrical stud, the end of which is made to bear on the wheel surface under spring pressure so as to produce a spark when the wheel is rotated.

In an arrangement of this character the end of the flint soon wears down to a concave surface corresponding to the convex surface of the wheel rim, whereby the sparking efficiency of the ignition is greatly reduced.

In the present invention it is proposed to provide a wheel with a striking surface of a continuously varying striking angle whereby the flint is alternately ground at opposite points of the shoulder and at the tip, and also at intervening points whereby the grinding down of the flint to a smooth concave surface corresponding to that the wheel is prevented.

It is further proposed to arrange the surface of the cutting wheel in such a manner that the flint contacts the wheel, through the major portion of the operation, at two spaced points only, and through the remainder of the operation, at the center line, whereby the operative value of a given spring pressure is greatly increased.

Further objects and advantages of my invention will appear as the specification proceeds and the novel features of my improvements will be fully defined in the claims attached hereto.

The preferred form of my invention is illustrated in the accompanying drawing forming part of this application, in which:

Figure 1 shows a plan view of my cutting wheel;

Figure 2, a side view of the wheel, with a flint in operative relation relative thereto; and

Figure 3, a cross-section taken along line 3—3 of Figure 1;

Figure 4, a cross-section taken along line 4—4 of Figure 1;

Figure 5, a cross-section taken along line 5—5 of Figure 1; and

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Figure 6, a cross-section taken along line 6—6 of Figure 1.

While I have shown only the preferred form of my invention, it should be understood that various changes or modification may be made within the scope of the claims hereto attached without departing from the spirit of the invention.

Referring to the drawing in detail, my flint igniter 1 comprises a wheel 2 which is rotatably mounted in a conventional manner, and a flint 3 of conventional cylindrical form having one end bearing on the peripheral surface of the wheel under the pressure of a spring (not shown).

The wheel 2 may be provided with suitable side flanges 4 so as to leave an annular central track 5 against which the flint operates. This track is ridged or roughened to provide an abrasive surface, in accordance with common practice.

Only a small area of this track, indicated at 6, is left to retain its cylindrical surface. Merging into this area, from opposite sides, I provide two V-shaped grooves 7, which gradually deepen as they recede from the area 6, until they meet, at equal depths, on the opposite side of the wheel, as at 10.

The width of these grooves may be approximately twice the diameter of the flint, so that the shoulders of the flint ride on the inclined walls of the grooves about midway their height.

The inclination of the walls of the grooves thus changes continuously, beginning, adjacent the flat area 6, with an angle of substantially zero degrees with respect to the axis of the wheel, and gradually changing so as to form an angle of substantially 30° at their point of juncture on the opposite side of the wheel, as shown in the detail sections of Figures 3 to 6. The angularity may, of course, be changed in accordance with the teachings of experience.

In operation, when the flint contacts the wheel at the deepest part of the groove, the side walls strike the shoulder of the flint at two diametrically opposite points, and at an angle of 30°.

The actual contact area is very small as compared with that of a flint bearing on a cylindrical surface, particularly when the flint has worn down to the surface of the wheel.

The friction caused by the spring pressure, therefore, is greatly in excess of that caused in the conventional arrangement, and rotation of the wheel will produce a better spark.

As the wheel is rotated, the striking angle of the wheel changes continually, attacking the end of the flint at constantly shifting points on op-

posite sides of the center. And when the flint finally rides over the non-grooved area 6 the center itself makes contact and is ground down.

This continuous change in the angularity of the striking face prevents the flint from wearing down to a groove fitting the striking face at any particular point. New striking points or striking edges will be available at all times and in all positions, and an old flint will produce a spark with the same efficiency as a new one.

Thus my improved wheel avoids cutting down at the end of the flint to a smooth arc on the wheel radius; it attacks the flint at continuously varying points, and it reduces the contact area in all positions, thereby increasing friction under a given spring pressure and producing a better spark.

I claim:

1. A cutting wheel for a flint igniter having a peripheral abrading surface comprising a non-grooved section and a grooved section merging into the former section, the grooved section having slanting side walls so as to cause the wheel to strike the end of the flint at opposing shoulders when the grooved section passes over the flint, and endwise when the non-grooved section passes over the flint.

2. A cutting wheel for a flint igniter having a peripheral abrading surface comprising a non-grooved section and a grooved section merging into the former section, the grooved section having slanting side walls of progressively changing angularity so as to cause the wheel to strike the flint at opposing shoulders and at varying angularities when the grooved section passes over the flint, and endwise when the non-grooved portion passes over the flint.

3. A cutting wheel for a flint igniter having a peripheral abrading surface comprising a non-grooved section and a grooved section merging into the former section and increasing in depth to a point on the side of the wheel opposite the non-grooved section, the grooved section being of uniform width and having slanting side walls of progressively changing angularity to cause the wheel to strike the flint at opposing shoulders and at varying angularities when the grooved section passes over the flint, and endwise when the non-grooved portion passes over the flint.

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