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FLINT AND STEEL ASSEMBLY FOR CIGARETTE LIGHTER

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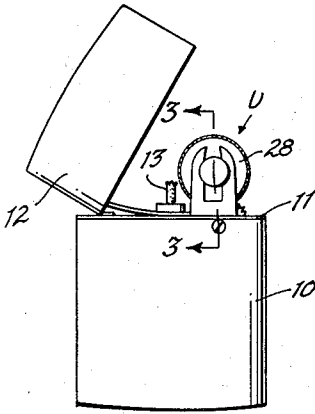


Fig. 1.

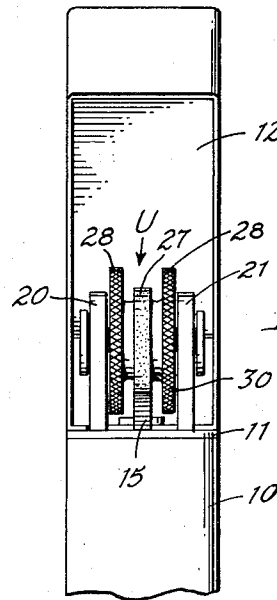


Fig. 2.

Fig. 3.

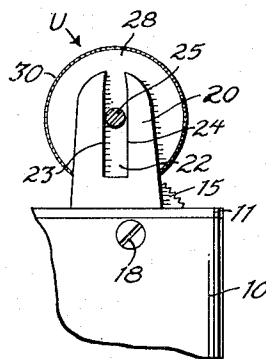
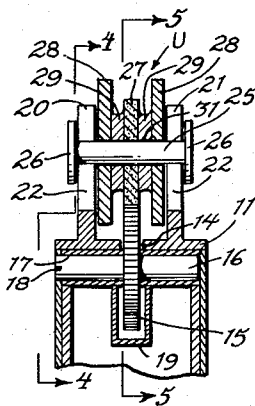


Fig. 4.

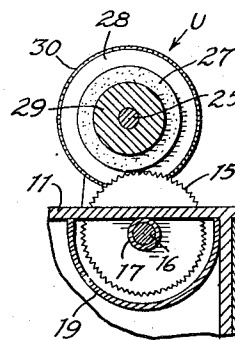


Fig. 5.

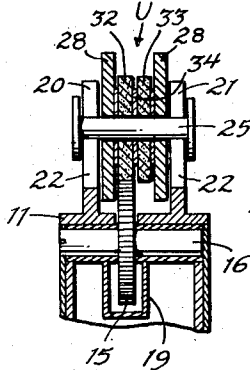


Fig. 6.

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FLINT AND STEEL ASSEMBLY FOR CIGARETTE LIGHTER

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5 Claims. (Cl. 67—7.1)

The present invention relates to cigarette lighters and is concerned primarily with a novel flint and steel assembly.

In the cigarette lighters now commonly used, the spark which ignites the wick is generated by the engagement of a rotary steel or abrasive with a small piece of flint that is located substantially flush with the top panel of the lighter casing. This conventional arrangement presents certain disadvantages which are intended to be obviated by this invention. The major disadvantage in the known flint and steel arrangement is the short service life of the flint which requires its replacement at frequent intervals. This may be attributed directly to the fact that the flint is mounted in a fixed position and is, therefore, comparatively small. It simply does not have sufficient body to afford a long service life.

Then again with the point of engagement between the flint and the abrasive wheel at or close to the top panel of the casing, when the lighter is filled with fluid, the flint is often covered with the fluid which is a highly dangerous and unsatisfactory condition.

With the foregoing conditions in mind, the present invention has in view as its foremost objective the provision of a flint and steel assembly for cigarette lighters which is characterized by the fact that the flint takes the form of a rotary disc with the steel taking the form of a wheel that is fixedly yet adjustably mounted substantially at the top of the casing.

By providing the flint in the form of a rotary disc, this disc may be made sufficiently large to afford a long service life, because it will naturally wear down in an even and uniform manner during continued use.

From the very nature of the operation required of a flint and steel assembly of the type with which this invention is concerned, the flint must engage the abrasive under pressure. A further object of the invention is to provide, in a cigarette lighter of the character aforesaid, a flint and steel assembly in which the abrasive steel wheel is fixedly mounted in the lighter casing so that a portion thereof projects above the top panel. Cooperating with this abrasive is a flint disc that is loosely mounted so that it will normally bear against the abrasive when the lighter is in an upright position and which is forced thereagainst under pressure by the thumb of an operator when the disc is rotated. An important feature of the present invention resides in the structure which loosely retains the flint in operative position. This structure preferably takes the form of a pair of brackets that upstand from the top panel of the casing and each of which has a slot opening into the end edge of the respective bracket. At the open ends, the sides of the slots converge to function as a retainer for maintaining the shaft which carries the flint in position in the slot. However, these converging ends may be distended sufficiently to permit removal of the flint as will later become apparent.

Another important object of the invention is to provide, in a cigarette lighter of the character indicated, a flint and steel assembly in which the abrasive wheel, while

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normally assuming a fixed position in which it is held against rotation, may be angularly adjusted by use of an appropriate tool to bring a fresh portion of its peripheral edge into position to be engaged by the flint.

Another important feature of the present invention resides in the fact that the flint is mounted on a shaft that is slidable in the slots in the brackets with the flint being freely rotatable. Thus, once the spark is generated and the pressure of the operator's thumb is removed, the flint will spin freely and obviate unnecessary and undesirable clogging of the abrasive surface.

Another object of the invention is to provide, in a cigarette lighter of the type indicated, a flint and steel assembly in which the flint unit comprises a shaft on which the flint disc is rotatably assembled. A pair of thumbwheels are assembled with the flint disc on opposite sides thereof and in driving relation with respect thereto. These thumbwheels have knurled edges that are adapted to be engaged by the thumb of an operator to press the disc against the abrasive and at the same time rotate the flint disc.

To this same general end of providing a long service life for the flint, the invention has as a further object the provision of a flint unit comprising a pair of flint discs that are mounted in spaced relation on a shaft and symmetrically arranged between a pair of thumbwheels with the abrasive being offset so as to engage only one of the discs. After this disc has been worn down an appreciable degree, the unit may be reversed by simply removing the shaft from the brackets and turning it around to thereby bring the other disc into effective engagement with the abrasive.

With the abrasive wheel projecting an appreciable distance above the top panel of the casing, there is no danger of that portion of the abrasive wheel which engages the flint being covered with fluid as the lighter is filled.

Various other more detailed objects and advantages of the invention, such as arise in connection with carrying out the above-noted ideas in a practical embodiment, will in part become apparent and in part be hereinafter stated as the description of the invention proceeds.

The invention, therefore, comprises a flint and steel assembly for cigarette lighters and which assembly consists, essentially, of a steel in the form of an abrasive wheel that is fixed yet adjustably mounted in the lighter casing so that a portion thereof projects above the top panel of the casing together with a flint unit including a flint disc mounted on a shaft that is slidable in a pair of brackets having slots receiving the shaft and upstanding from the top panel. In a modified form of the invention, the flint unit includes two flint discs which are symmetrically arranged on the shaft and either of which is adapted to engage the abrasive wheel. In both forms of the invention, the flint unit includes a pair of thumbwheels located on opposite sides of the flint disc.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawing wherein:

Figure 1 is a view in side elevation of a cigarette lighter including a flint and steel assembly designed in accordance with the precepts of this invention.

Figure 2 is a detail taken on an enlarged scale and normal to the showing of Figure 1.

Figure 3 is a vertical section taken about on the plane represented by the line 3—3 of Figure 1.

Figure 4 is a detail taken as a view in side elevation about on the plane represented by the line 4—4 of Figure 3.

Figure 5 is a detailed vertical section taken about on the plane represented by the line 5—5 of Figure 3; and Figure 6 is a vertical section through a modification.

Referring now to the drawing wherein like reference

characters denote corresponding parts, a cigarette lighter is illustrated as including a casing 10. Such a casing ordinarily includes a panel 11 at the top. The casing 10 may also be provided with a cover 12 that is hingedly mounted in a conventional manner. A wick shown at 13 upstands from the top panel 11 and communicates with the reservoir of lighter fluid within the casing 10. It is this wick 13 that is ignited by the novel flint and steel assembly of this invention.

Referring now more particularly to Figures 3 and 5, the top panel 11 is shown as being formed with a longitudinally extending slot 14 through which a portion of a steel in the form of an abrasive wheel 15 passes. This abrasive wheel 15 is nonrotatively mounted on a stub shaft 16. The opposite end portions of the shaft 16 are tightly journaled in bearings 17 that are carried by the wall structure of the casing. One end of the shaft 16 is provided with tool engaging means in the form of a slot 18. The fit of the shaft 16 in the bearings 17 is of the utmost importance. This fit should be sufficiently tight to hold the abrasive wheel against rotation under normal operating conditions. However, it is intended that a tool such as a screwdriver may be applied to the slot 18 to rotate the shaft and thus angularly adjust the abrasive wheel 15 to bring a fresh arcuate sector into position where it is engaged by a flint disc to be later described.

To protect the abrasive wheel 15 from fluid in the casing 10 so as to insure that none of this fluid ever gets on the abrasive wheel, a shield 19 is provided. This shield is of the construction depicted in Figures 3 and 5 and depends from the top panel 11.

Upstanding from the top panel 11 in spaced relation are two brackets 20 and 21. These brackets are made from a material having the properties of resiliency and elasticity to a required degree. A sheet metal such as steel has been found to be entirely satisfactory. Opening into the top end edge of each of the brackets 20 and 21 is a slot 22. This slot 22 is defined by side edges 23 and 24 which converge slightly at the open end of the slot. This converging relation together with the resilient property of the brackets is of importance as will now become apparent.

A shaft 25 is received in the slots 22 and bridges the space between the brackets 20 and 21. This shaft has heads 26 on its opposite end which hold the shaft from axial displacement. This shaft 25 may slide up and down in the slots 22 and is retained therein by the converging ends of the slots. However, the shaft may be removed from the brackets by applying sufficient force in an upward direction to spread the converging side edge portions of the slots.

A flint unit is referred to in its entirety by the reference character U. This unit U comprises a flint disc 27 that may be manufactured in accordance with known practices in the flint art. Arranged on opposite sides of the flint disc 27 and in spaced relation relative thereto are two thumbwheels 28. Washers or shims such as shown at 29 may be employed to achieve the spaced relation of the thumbwheels 28 relative to the disc 27.

The washers 29 and thumbwheels 28 ordinarily are of metal and are assembled with the disc 27 as a composite unit so that rotation of the thumbwheel causes rotation of the disc. The peripheral edges of the thumbwheels 28 are provided with knurled surfaces such as shown at 30 in Figure 2 to facilitate operation under the influence of the thumb of a user.

The unit U is formed with a transverse bore 31 which freely receives the shaft 25. Thus, the unit U is free to spin on the shaft. While the unit U might be drivably mounted on the shaft 25 and provision made for the shaft 25 to rotate in the slots 22, it is believed that the arrangement of having the unit U spin freely on the shaft 25 is more desirable.

Operation

While the mode of operation of the flint and steel assembly of this invention is believed to be obvious from the illustration of the drawing and description of parts given, it may be briefly outlined as follows:

With the unit U assembled on the shaft 25, the latter is inserted in the slots 22 of the brackets 20 and 21 by simply forcing the shaft downwardly under sufficient pressure to spread the converging ends of the slots. In this position the flint disc 27 will normally engage the uppermost portion of the abrasive wheel 15.

When the wick 13 is to be ignited, the operator applies his thumb to the thumbwheels 28. The action is such as to force the flint disc 27 against the abrasive under pressure and, at the same time, rotate the disc. As the abrasive 15 is held immovable, a spark is created which ignites the wick 13. Immediately the thumb is relieved from the thumbwheels, the unit U is free to spin on the shaft 25 and this action minimizes clogging of the abrasive.

It is evident that with continued use, the flint 27 will wear down, but this wear is accommodated by the mounting of the shaft 25 in the slots 22. Thus, a flint is provided which has a service-life many times that of the flints now being used in cigarette lighters.

Modification

Figure 6 illustrates a modification which provides even a longer service life in the flint. In this form of the invention, the unit U includes two flint discs 32 and 33 which are maintained in spaced relation by a shim or spacer 34. The thumbwheels 28 are provided on opposite sides of the discs 32 and 33, in the same manner above described in connection with the main form of the invention, with the discs, spacers, and thumbwheels being assembled as a composite unit.

The abrasive 15 is slightly offset with respect to the mid-plane of the casing 10 so that it engages only one of the discs 32 or 33.

After the disc which engages the abrasive has worn an appreciable degree, the unit U may be removed from the brackets by simply pulling the shaft out of the slots whereupon the unit is reversed to bring the other of the discs into engagement with the abrasive. This reversing action is repeated from time to time until both of the discs are completely worn out.

While preferred specific embodiments of the invention are hereinbefore set forth, it is to be clearly understood that the invention is not to be limited to the exact construction, mechanisms, and devices illustrated and described, because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claims.

What is claimed is:

1. In a cigarette lighter including a casing having a top panel, a flint and steel assembly comprising a steel in the form of an abrasive wheel fixedly mounted in said casing and having a portion projecting above said top panel, a pair of spaced brackets upstanding from said panel, and a flint unit rotatably and slidably mounted in said brackets, said unit including a rotary flint disc and a thumbwheel in driving relation with respect to said disc.

2. In a cigarette lighter including a casing having a top panel, a flint and steel assembly comprising a steel in the form of an abrasive wheel fixedly mounted in said casing and having a portion projecting above said top panel, means for angularly adjusting said abrasive wheel, a pair of spaced brackets upstanding from said panel, and a flint unit rotatably and slidably mounted in said brackets, said unit including a rotary flint disc and a thumbwheel in driving relation with respect to said disc.

3. In a cigarette lighter including a casing having a top panel, a flint and steel assembly comprising a steel in the form of an abrasive wheel fixedly mounted in said casing and having a portion projecting above said top

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panel, a pair of spaced brackets upstanding from said panel, each of said brackets being formed with a longitudinal slot having converging side edges at its open end, a shaft bridging said brackets and slidable in said slots, and a flint unit carried by said shaft, said unit including a flint disc and a thumbwheel in driving relation with respect to said disc.

4. In a cigarette lighter including a casing having a top panel, a flint and steel assembly comprising a steel in the form of an abrasive wheel fixedly mounted in said casing and having a portion projecting above said top panel, a pair of spaced brackets upstanding from said panel, each of said brackets being formed with a longitudinal slot having converging side edges at its open end, a shaft bridging said brackets and slidable in said slots, and a flint unit freely rotatable on said shaft, said unit comprising a flint disc and a pair of thumbwheels on the opposite side thereof and in driving relation relative thereto.

5. In a cigarette lighter including a casing having a top panel, a flint and steel assembly comprising a steel

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in the form of an abrasive wheel fixedly mounted in said casing and having a portion projecting above said top panel, a pair of spaced brackets upstanding from said panel, each of said brackets being formed with a longitudinal slot having converging side edges at its open end, a shaft bridging said brackets and slidable in said slots, and a flint unit carried by said shaft, said unit comprising a pair of flint discs in spaced relation, and a pair of thumbwheels on the outer sides of said discs, spaced relative thereto, and in driving relation relative to said discs.

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