

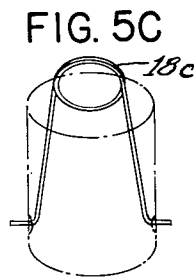
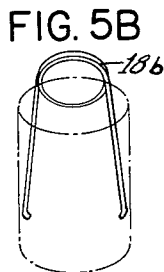
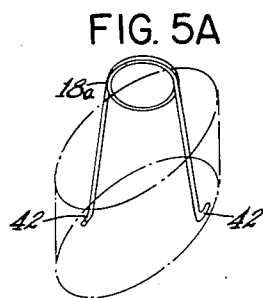
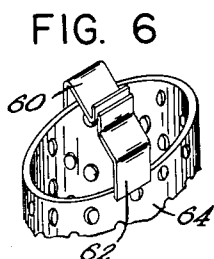
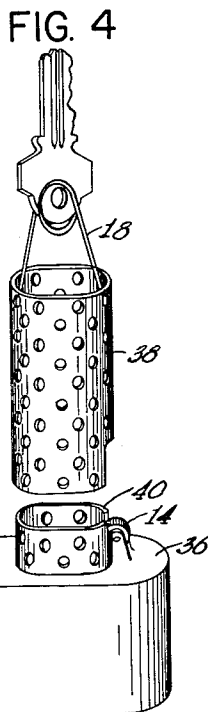
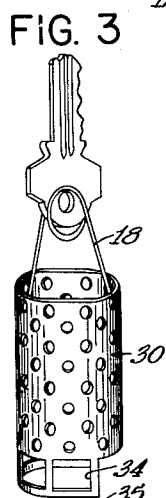
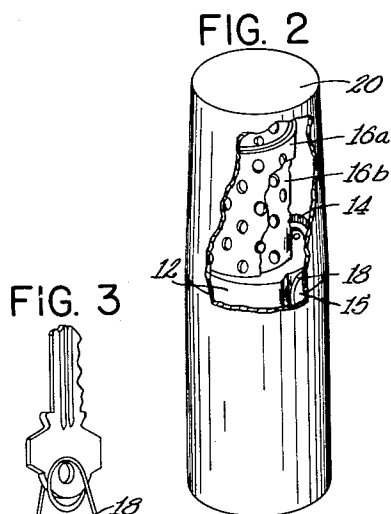
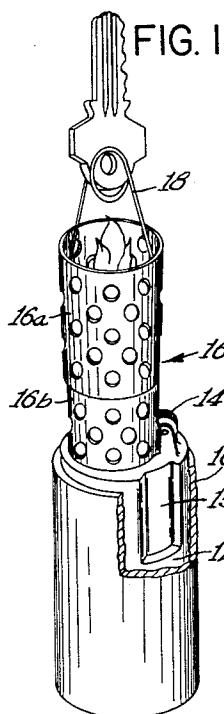
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LOCK DEICER

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LOCK DEICER

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This invention relates to a lock deicer and more particularly to a device for freeing a key lock from a coating of ice.

Key locks are subject to entry of water from the atmosphere. When below freezing temperatures occur, water present in the lock freezes and binds the lock to prevent its operation in use. The water present in the air on a humid day is often sufficient to enter the open keyway of the lock and eventually create icing troubles. The problem is particularly acute in automobile door locks where the lock is often exposed to water and cold weather conditions. Occasionally, weather conditions are such that, while the lock is at a below freezing temperature the atmospheric temperature may be above freezing and it may be raining. When this situation occurs, it often results in the coating of the key entrance way with a layer of ice. The problem of opening a frozen lock is particularly difficult in the case of an automobile door lock because of the concealment of the tumbler. The present invention provides a simple and inexpensive device for melting a coating of ice from the outside of a lock and for providing means for freeing the lock from the bonds of internal ice to permit opening.

Accordingly, it is an object of this invention to provide a lock deicing means.

It is another object of this invention to provide means for freeing a frozen lock.

It is another object of this invention to provide a pocket size lock deicing means.

It is another object of this invention to provide a lock deicer employing a conventional pocket cigarette lighter as a heat source.

Still other objects and advantages of this invention will become obvious or will be pointed out with particularity in the following specification and drawing in which:

FIGURE 1 shows pictorially the lock deicer of this invention in condition for operation.

FIGURE 2 shows pictorially, and partially broken away, the lock deicer of FIGURE 1 in a collapsed and encased condition for storage.

FIGURES 3 and 4 show pictorially different modifications of this invention adapted to employ a conventional pocket cigarette lighter as a heat source, with the lighter positioned in exploded relationship.

FIGURE 5 shows, in elevation, three variations for a key retaining member employed in the carrying out of the invention. The heat source structure to which it is attached is shown in phantom.

FIGURE 6 shows pictorially, an alternate embodiment having an integrally incorporated key supporting means.

Referring to the drawing, outer casing 10 receives an inner casing 12, which may be filled with an absorbent packing such as cotton fibers. An inflammable fluid such as conventionally employed in cigarette lighters is permitted to saturate the cotton. A wick located in the absorbent packing is positioned with one end extending from the casing 12. An abrasive wheel 14 arranged to be manually, or mechanically actuated, is turned against a flint to throw a spark toward the wick. The wick is impregnated with the inflammable fluid so that as a result the fluid ignites and provides a flame. The mechanical features of lighters are well known to the art as taught for example by U.S. Patent 2,032,695. The device disclosed hereinafter may be built employing similar principles. However, this invention employs a chimney 16 not found

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in cigarette lighters. The function of the chimney differs from the conventional windshield employed in pocket type cigar and cigarette lighters in that the conventional lighter windshield serves merely to protect the flame from being blown out by air currents, without interfering with the use of the lighter to ignite cigarettes. The conventional lighter is operated with the flame extending above the windshield. On the contrary, the chimney 16 surrounds the flame so that the flame is not exposed as is normal in the operation of a cigarette lighter. After a few minutes of operation it will be found that the side of the chimney 16 is sufficiently hot to melt a coating of substantial thickness from the outside of the lock by touching the chimney to the ice. The device provides a surprising heat output, for example, it has been found capable of deicing a 1/2" thick coating of ice formed on the cooling coil of a household refrigerator. After the ice has been removed from the outer portion of the lock, the key is inserted into the lock and operation of the lock attempted. Occasionally, an external heat source is insufficient to deice the interior of the lock because of the mass of the mechanism. Accordingly there is provided spring means 18 for positioning the key approximately 1/4" above the top of the chimney so as to permit the key to be heated by the flame. A key suitably positioned for the key heating operation is shown in FIGURE 1.

Employing the case 10 as a handle for the hot key, the heated key is then inserted into the lock to complete the deicing operation.

The inner casing 12 may be provided with a recessed portion 15 which forms a pocket against the inner wall of casing 10. This pocket provides a convenient place for the storage of spring 18.

It is an important advantage of this invention that the heated member, the key intended to fit a given lock, will do so in a close fit. This facilitates insertion and heat transfer from the heated member. It has been known to provide electrically heated wires for the purpose of lock defrosting. However, a problem exists in that the wire, the electrically heated element, is often too large or not suitably shaped to fit a lock. It may be noted that a lock is designed to prevent the entrance of a foreign object such as a lock picking wire. On the other hand, since the key will precisely fit the lock for which it is intended this problem is not present in employing the present device.

For storage the chimney 16 may be collapsed, as is shown in FIGURE 2, and a cover 20 of the sleeve type slipped over the casing member 10. A hinged cover or casing of different configuration may be employed if so desired.

It is to be noted that in the collapsed condition, the openings in the two portions of the chimney 16a, 16b coincide, so that the apparatus may be employed as a cigarette lighter.

A conventional cigarette lighter may be utilized as the heat source by providing a chimney 30 adapted to slip over the windshield of a windshield type lighter 32. It is to be noted that, in FIGURE 3, there is shown a lighter equipped with a windshield 35 of the slotted type. Accordingly, the chimney is arranged with large openings 34 to prevent the blocking of the ventilating holes and thus provide ample air passage up along the flame. In FIGURE 4, there is shown a similar arrangement employed with a lighter 36 having round air ventilating openings located in the windshield 40. In this instance it will be noted that the pattern of openings in chimney 38 are arranged to coincide with the openings in the lighter shield 40.

In FIGURES 5a-5c there are shown variant embodiments of a spring member which are adapted to fit vari-

ous types of chimney and windshield structures, and are adapted for holding a key approximately $\frac{1}{4}$ of an inch above the flame of a lighter. This arrangement would be suitable where it was not necessary to defrost or deice the entire lock but was necessary only to provide a moderate amount of heat to free a lock that was prevented from operation due to internal icing. This arrangement has been found suitable only where a bare film of ice exists in the lock mechanism.

The embodiment of FIGURE 5a is provided with "L-shaped" ends 42 parallel to each other and adapted to press against the inner wall of a slotted windshield of the type shown in FIGURE 3.

In FIGURE 5b there is shown a spring suitable for use with the chimney arrangements of FIGURES 1-4 and which is universally adaptable for use with many lighter windshields of standard configuration. This spring is of the "bowed" type and does not rely on engaging fingers.

The alternate spring embodiment of FIGURE 5c is provided an "L-shaped" coplanar prong arrangement adapted to fit through the openings in a windshield of the type shown in FIGURE 4. This spring member may also be used with the chimney of this invention.

In FIGURE 6 there is shown an alternate arrangement in which a pair of spring members 60 and 62 are provided as an integral portion of the chimney 64. It has been found essential that members 60 and 62 be located at least $\frac{1}{4}$ " above the top of chimney 64 in order to prevent interference with the flame. Members 60 and 63 may be formed of suitable spring stock attached to chimney 64 by conventional fastening techniques such as welding, riveting, etc.

The deicing apparatus disclosed herein may be employed for other like purposes as required.

Brass has been found to be a suitable material for the chimney. Other suitable heat conducting materials may be substituted.

While the use of a conventional lighter as a component of the disclosed deicing device has been taught hereinabove, it is to be appreciated that the lighter and the deicing device operate in quite different fashions. The lighter is designed with the shield surrounding the lower or cool portion of the flame so as to avoid extensive heating of the shield other than mere incidental heating. On the other hand, it is an essential characteristic of the device of this invention that the chimney be heated by the flame so that it may serve as a source of stored heat. The length of the chimney member is important and a minimum length of $1\frac{1}{4}$ " has been found necessary. A length of 3" has been found adequate. In general the length should be between $1\frac{1}{4}$ " and $3\frac{1}{2}$ ".

What is claimed is:

1. A deicer device for a key operated lock comprising a tubular open-ended perforated heat conductive member having a length of at least $1\frac{1}{4}$ ", having one end provided with a central opening and a second end mounted on a portable flame source, said source including a self-contained fuel supply, for providing an axially located elongated flame area substantially coextensive with said tubular member; clamping means carried by said tubular member for releasably supporting a key adapted to fit said lock, whereby said key is positioned proximate said central opening and above said flame area.

2. The device of claim 1 wherein said clamping means is a spring member.

3. The device of claim 1 wherein said clamping means is detachable.

4. The device of claim 1 wherein said clamping means is a detachable "hairpin" shaped spring.

5. A lock deicing means comprising a source, including a self-contained fuel supply, adapted to produce an elongated flame; a perforated heat conductive tubular member positioned to coaxially enclose and be substantially coextensive with the flame area; and a spring member means detachably affixed to the open end of said tubular member to releasably secure a key above the flame area.

6. An apparatus for heating a key for deicing of a lock adapted to receive said key, comprising in combination: a flame producing device, including a self-contained fuel supply provided with a tubular perforated windshield, having an inner wall, an outer wall, and an open end, said windshield defining a flame area; and a removable "hairpin"-shaped spring member comprising a pair of leg members joined by a helically coiled clamp member, said leg members being adapted to press against the said inner wall so as to secure said spring member to said windshield, said coiled clamp member supported by said leg members above said open end to grip said key and support it above the open end.

7. The apparatus of claim 6 wherein said spring members include coplanar end sections formed at right angles to the said leg member, said end sections extending outwardly in opposite directions.

8. The apparatus of claim 6 wherein said spring members include end sections formed at right angles to the said leg members, said end sections being substantially parallel to each other and extending outwardly in opposite directions.

9. A lock deicing means comprising a casing, an elongated flame source and an integral fuel source enclosed by said casing; a perforated heat conductive tubular member extending from said casing; a spring member means detachably affixed to the open end of said tubular member to releasably secure a key proximate to the central axis of said tubular member; and means to retain said spring member in said casing when said spring member is detached from said tubular member.

10. A lock deicing means comprising a source, including a self-contained fuel supply adapted to produce an elongated flame; a perforated heat conductive tubular member having one end fixed to said source and an outwardly extending open end; and a spring member means detachably affixed to the open end of said tubular member to releasably secure a key above the open end, said tubular member being characterized by a plurality of telescoping coaxial sections and by the coincidence of perforations when in a collapsed condition.

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