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SELF-EJECTING KEYHOLDER WITH ILLUMINATION

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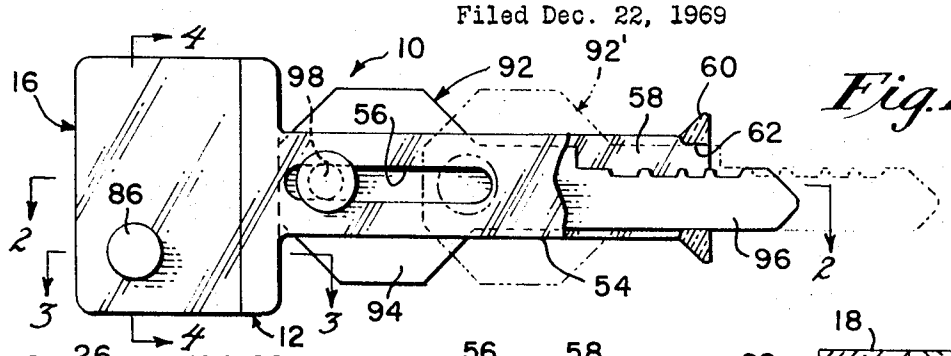


Fig. 1.

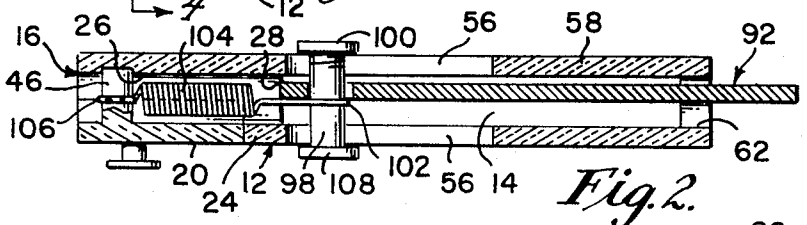


Fig. 2.

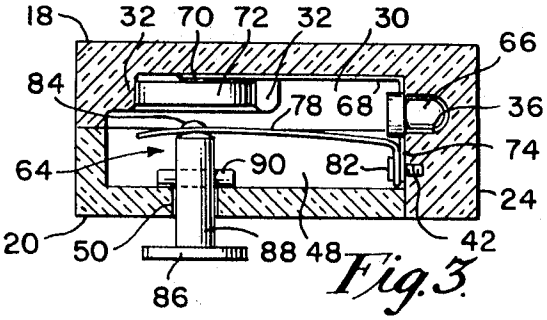


Fig. 3.

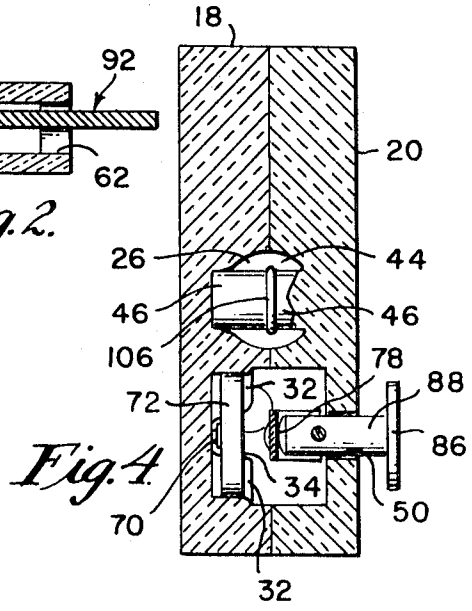


Fig. 4.

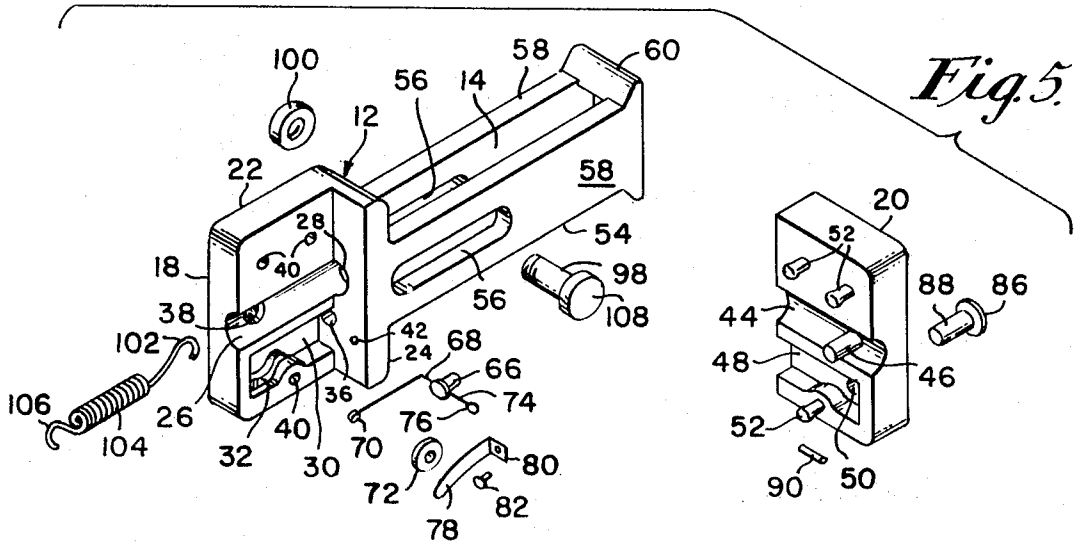


Fig. 5.

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SELF-EJECTING KEYHOLDER WITH ILLUMINATION

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ABSTRACT OF THE DISCLOSURE

A keyholder comprising a case with a channel formed therein for reception of a key. The key is slidably mounted within the channel and spring means are provided for automatically ejecting a key from a lock. The casing is formed from a transparent plastic, and light means are positioned within the casing. When the light means are turned on, the light produced will be diffused through the transparent plastic, thereby illuminating the key and the associated lock, and thus facilitating the insertion of the key in the lock.

This invention relates to a key holder, and more particularly, to a keyholder that will automatically eject a key from a lock after the key has been used to perform its locking or unlocking function.

In recent years, a number of devices have been developed for automatically ejecting a key from a lock into the user's hand. All of these devices provide some form of spring means to provide a spring tension against the key which will automatically remove the key from the lock after the key has been turned in the lock to perform its locking or unlocking function. Devices of this type have been found to be particularly useful on automobile keys. Thus, it has been found that a great many automobile thefts are occasioned by the owner's inadvertently leaving his key in the ignition after turning off the engine. When utilizing the key holders with the self-ejecting means presently in use, when the ignition is turned off, the key will automatically be ejected into the driver's hand, thereby preventing the inadvertent leaving of the key in the ignition lock.

One of the devices shown in the prior art includes a rectangular case for the key, with a pair of longitudinally extending slots formed in each side of the case. The key is received in a channel within the case, and is retained in the case by spring means. The key is removed from the case by use of a projecting pin which passes through the slots and the hole in the keyhead.

The device of this invention provides a number of structural improvements over this prior art keyholder, and because of these improvements, possesses a number of functional advantages.

One of the improvements of the device of this invention is the provision of a channel in the case which is open at its top and bottom. In this way, only the jagged edges of the key will be maintained within the channel, and the head of the key will project outwardly of the channel. Accordingly, the key holder of this invention can be made smaller in size than the prior art keyholder in that it will not be necessary to provide a channel sufficiently large to accept all variations in keyhead sizes.

Another improvement embodied in the device of this invention is the provision of light means in connection with a case formed from a transparent plastic. When the light means are turned on, the light will be diffused through the plastic, thereby illuminating the key and the associated lock. This in turn facilitates the insertion of the key into the lock.

It is accordingly an object of this invention to provide a novel keyholder.

It is another object of this invention to provide a novel self-ejecting keyholder with illuminating means.

These and other objects of this invention are accomplished by providing a keyholder comprising a case, a channel formed within said case for the reception of a key, spring means urging said key into said case, said key being slidable out of said case against the urging of said spring means, said case being formed from a transparent material, and light means within said case, with the light from said light means being diffusable through said case, whereby said key and the lock into which said key will be inserted will be illuminated.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a side elevational view of the keyholder of this invention, partially broken away for the purpose of clarity;

FIG. 2 is a sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is an enlarged sectional view taken along the line 3—3 of FIG. 1;

FIG. 4 is an enlarged sectional view taken along the line 4—4 of FIG. 1; and

FIG. 5 is an exploded perspective view of the keyholder of this invention.

Referring now in greater detail to the various figures of the drawings wherein like reference characters refer to like parts, a keyholder embodying the present invention is generally shown at **10** in FIG. 1. Device **10** basically comprises a case **12** having a channel **14** for the reception of a key.

The rear portion **16** of case **12** is basically rectangular in shape, and includes an L-shaped base plate **18** and a cover plate **20**. Base plate **18** includes a leg **22** which lies in a plane that is parallel to channel **14** and a leg **24** which is perpendicular to the channel. A channel **26** is formed in leg **22**. Channel **26** continues as an opening **28** through leg **24**, and is therefore in communication with channel **14** (FIG. 2).

A recess **30** is formed in leg **18**, and includes an arcuate wall **32** therein. A slot **34** is formed in wall **32** (FIG. 4). A recess **36** is formed in leg **24** (FIG. 3). Recess **36** is in communication with recess **30**.

A recess **38** is formed in channel **26**. A plurality of notches **40** is formed in the inner surface of leg **22**, and notch **42** is formed on the inner surface of leg **24**.

Cover plate **20** includes a channel **44** formed on its inner surface. Channel **44** is adapted to be aligned with channel **26**, thereby forming a circular channel (FIG. 4). A pin **46** is formed in the wall of channel **44**. A recess **48** is formed below channel **44**. A hole **50** passes from the exterior of plate **20** into recess **48**. A plurality of pins **52** is formed on the interior surface of plate **20**. Pins **52** are adapted to be received in notches **40** when cover plate **20** is placed against base plate **18**.

Channel **14** is formed in a horziontal extension **54** of leg **24**. Extension **54** comprises a bar having vertical channel **14** extending therethrough. A slot **56** is formed in each leg **58** of bar **54**. A flange **60** is formed at the forward end of legs **58**, and an opening **62** is formed in flange **60**. Opening **62** is in communication with channel **14**.

A light assembly, generally shown at **64** in FIG. 3, is mounted in a chamber formed by recesses **30** and **48**. The light assembly **64** includes a miniature incandescent lamp **66** which is mounted in recess **36**. Lead **68** connected to lamp **66** ends in terminal **70** which is positioned within arcuate wall **32**. A wafer battery **72** is snapped into the recess formed by arcuate wall **32**, and is in electrical connection with terminal **70**.

A second lead **74** is connected to lamp **66**, and terminates in ring **76**. A metallic leaf spring **78** having a flange **80** is mounted over ring **76**. A screw **82** passes through a hole in flange **80** and ring **76**, and is threadedly secured in leg **24** (FIG. 3), thereby securing lead **74** and leaf spring **78** in place. An outstruck nib **84** is formed on spring **78**.

A disc **86** having a projecting shank **88** is mounted on plate **20** by passing the shank through hole **50**. The shank is held in place by pin **90** which passes through a hole **92** in the shank.

As seen in FIG. 3, leaf spring **78** urges shank **88** outwardly from hole **50**. However, pin **90** maintains the shank in place. When it is desired to light lamp **66**, the circuit including the lamp is closed by depressing disc **86** thereby bringing nib **58** into physical and electrical contact with wafer battery **72**, thereby completing a circuit comprising the battery, lead **68**, lamp **66**, lead **74** and leaf spring **78**. As will be explained hereinafter, when lamp **66** is lit, the entire case **12**, including arm **54**, will be illuminated.

A key **92** having a head **94** and a shank **96** is mounted in channel **14** by inserting the shank of the key into the channel and passing the shank through opening **68**. A threaded pin **98** is passed through a slot **56**, through a hole in the head of the key **92** and out through the other slot **56**. A circular nut **100** is then threadedly secured on pin **98**, thereby securing key **92** in channel **14** (FIG. 2). One end **102** of coiled spring **104** is looped over pin **98**. The spring is then placed in channel **26**. Cover plate **20** is then positioned against base plate **22**, and the two plates are secured together by the insertion of pins **52** in the associated notches **40**. The light assembly **64** is assembled on base plate **18** prior to the time the cover plate **20** is mounted in place. At the time the cover plate is mounted in place, pin **46** is passed through a loop **106** formed on the other end of spring **104**. The fully assembled condition of the key ejecting mechanism is shown in FIG. 2.

When it is desired to use the key **92**, the key is moved from the position shown in full line in FIG. 1 to the position shown in phantom at **92'** in FIG. 1. This is accomplished by grasping nut **100** and disc **108** on pin **98** with the thumb and forefinger and pushing the pin forward in slot **56**, thereby moving the key to the position shown in phantom in FIG. 1. This will expose the cut teeth in the key, and will enable the insertion of the key into a lock. After the key has been inserted into the lock, the key and the associated keyholder **10** are then rotated in a clockwise or counterclockwise direction in order to open or close the lock. After the rotational movement of the lock has been completed, and pressure is removed from the pin **98**, spring **104** will urge pin **98** back to the position shown in FIG. 2, thereby withdrawing the key from the lock. This is accomplished in view of the fact that flange **60** will abut the face plate of the lock and end **106** of spring **104** is rigidly mounted relative to the flange **60**. Therefore, all movement of the spring takes place with the movement of pin **98**, which is secured to key **92**. When the keyholder is used in the manner described above, the spring **104** will completely remove the key from the lock, and deposit the key in the user's hand. In this way, there will be a self-ejecting action on the key, thereby obviating the problem of inadvertently leaving the key in a lock.

The device of this invention is particularly useful in connection with automobile ignition locks. When a key has been rotated in the lock to unlock the ignition system, the key will automatically be retained in the lock by the lock tumblers. This prevents the removal of the key from the ignition when the ignition is unlocked, thereby making theft of the car more difficult. Thus, so long as the ignition is in the "on" position, the key will be retained in the lock. However, as soon as the ignition is turned off, the key will automatically be ejected from the ignition lock by the action of spring **104** on pin **98** and the key secured thereto.

The keyholder is formed from a transparent material, which is preferably a transparent plastic. The base plate **18** and arm **54** are molded as a unitary element and cover plate **20** is a unitary molded element. Any of the transparent plastics known to the art can be used in carrying out this invention. Thus, polystyrene, phenolic plastics, such as Bakelite, or acrylic plastics, such as Lucite, can be used.

The use of the transparent material serves the function of diffusing and transmitting the light produced by lamp **66**. Thus, when using the keyholder of this invention, the user will hold the rear portion in one hand, and at the same time depress disc **86**, thereby lighting lamp **66**. The light emanating from the lamp will then be diffused and transmitted by the transparent material along arm **54**, thereby illuminating key **92** and the lock into which the key will be inserted. The key can then be moved to the position shown at **92'** by the other hand. In this way, the key holder **10** serves the dual purpose of providing a self-ejecting mechanism for a key, and in addition, a light serves for illuminating the key and the associated lock when the key is to be used in unlit places.

Having channel **14** passing entirely through arm **54** permits the keyholder to be used with all keys, regardless of the size of the heads of the keys. Thus, the head **94** of the key projects above and below the top and bottom edges of legs **58**. In the prior art devices, the case for the key is entirely enclosed, and therefore the channel for storing the key must be sufficiently large to accommodate all sizes of key heads. In many cases, the keyholder will necessarily be much larger than necessary for accommodating the key. This problem does not exist when utilizing the open channel of the keyholder of this invention.

Another feature of the keyholder of this invention is the fact that the case is basically rectangular in shape, with the sides of the case being parallel to the sides of the key. In many of the prior art devices, a tubular case is utilized. Having the flat case of the keyholder of this invention facilitates the storage of the keys in the pocket of the user, and it will not produce any unsightly bulges, as are produced when using tubular cases. Although the invention has been described as using pins **52** in notches **40** to secure cover plate **20** on base plate **18**, it is to be understood that other securement mean cans be used. Thus, screws passing through cover plate **20** can be threadedly secured in base plate **18** in order to obtain the desired connection.

If it should become necessary to replace battery **72**, cover plate **20** is removed, and a new battery is easily inserted in the recess formed by arcuate wall **32**. After the device has been assembled, and it is desired to change keys, it is not necessary to remove cover plate **20**. All that need be done is to remove pin **98** from the hole in the key, and insert a new key into channel **14**. During this process, the end **102** of spring **104** need not be removed from the pin **98**.

Without further elaboration, the foregoing will so fully illustrate my invention, that others may, by applying current or future knowledge, adopt the same for use under various conditions of service.

I claim:

1. A keyholder comprising a case, a channel formed within said case for the reception of a key, spring means urging said key into said channel, said key being slidable out of said channel against the urging of said spring means, said case being formed from a transparent, light-transmitting plastic, said case further including a compartment, with said channel being formed forwardly of said compartment, and light means within said compartment, said light means including a lamp which is wholly within said compartment, whereby the light from said lamp will be diffused through said light-transmitting, transparent plastic, thereby illuminating said key and the lock into which said key will be inserted.

2. The keyholder of claim 1 wherein said compartment comprises a base plate and a removable cover plate, and said lamp is mounted within said base plate.

3. The keyholder of claim 2 and further including battery means and switch means in said compartment, whereby the closing of a circuit comprising said lamp, said battery means and said switch means by said switch means will light said lamp.

4. The keyholder of claim 3 wherein said switch means comprises a depressible button on said case.

5. The keyholder of claim 3 wherein said battery means comprises a wafer battery, and said base plate includes a recess for said wafer battery.

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ROBERT L. WOLFE, Primary Examiner

U.S. Cl. X.R.

70—456 R; 240—6.4 K