

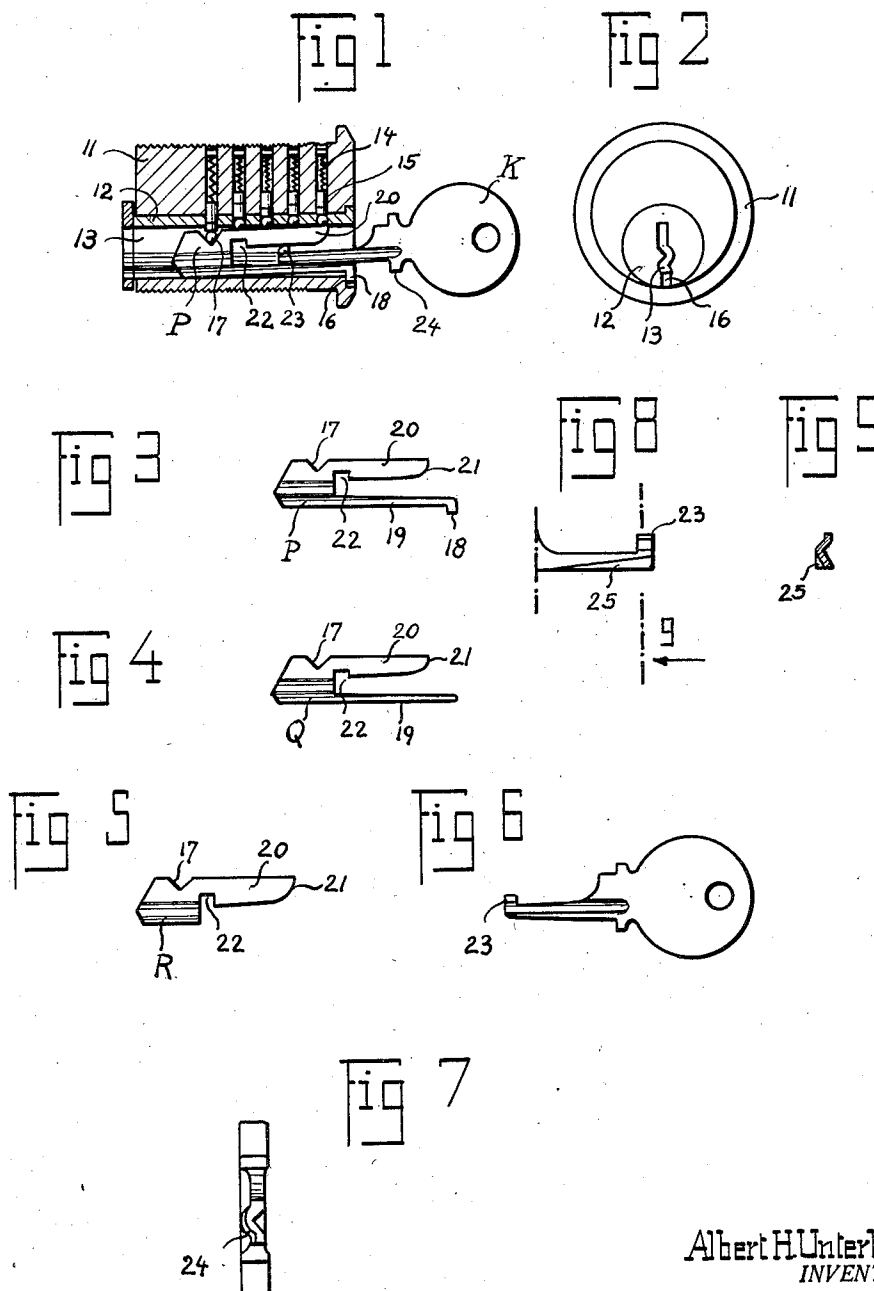
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CYLINDER KEYWAY GUARD

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## UNITED STATES PATENT OFFICE

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## CYLINDER KEYWAY GUARD

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## 4 Claims. (Cl. 70-8)

This invention relates to a guard for cylinder key-ways. More particularly it serves to provide simple means preventing, under certain circumstances, the use in a tumbler lock of a key which is made for operating said lock.

Devices of this type have been made before. Some devices of the old art provide plugs which are locked in the keyway by one or the other of the tumblers and which require for removal a sectional key.

The sectional key fits between the plug and the tumblers, pushing the tumblers out of engagement with the plug, which ordinarily is pressed by said tumblers onto the opposite side of the keyway. The skeleton key, after it has been pushed into the keyway and has pressed the tumblers out of the way, will also have to enter into engagement with the plug, in order to permit the removal of the plug. The distance to which the skeleton key moves transversely in engaging upon the plug must be short and limited. It must also be realized that the keyway in such an instance must permit the transverse movement of the skeleton key in order to permit engagement. On keyways of a very irregular profile, such a method cannot be applied or the transverse play of the skeleton key must be very limited.

Such shortcomings were tried to be overcome in the prior art by providing a multiplicity of engaging means on the skeleton key. Keys for tumbler locks are generally made of a very soft metal. Under those circumstances, the "rattling" of the sectional key in being introduced alongside of the plug will wear and tear the teeth in a very short time. On the other hand there is no definite indication for the operator using the said key whether or not it has been fully inserted.

These and many other considerations, which will become more clear hereinafter, have guided me in developing this improved cylinder keyway guard, which primarily differs from the prior art in the following respects:

First: There is no necessity of making the skeleton key complementary to the plug in the manner of the prior art, and that is not done by me.

Second: There is always a certain lateral play in any key profile in respect to the keyway. This play may be made use of for pressing the plug into engagement with a skeleton key, i. e., by a reversal of the method of the old art.

Third: A good grip of a substantial tooth of the key on the plug may be brought about by displacing or forcing the plug in the lock into a slanted position by the inserted key and by also allowing for a slanted insertion of the key, the plug as well as the key being straightened out

from such slanted positions when final engagement of the key upon the plug takes place.

Fourth: Under such circumstances it may be preferable to insert the key centrally in the plug, in a longitudinal slot for instance, instead of upon one side thereof.

Fifth: Since in my invention I do not intend to lock the plug in the keyway, but I use the preferred method of placing it in such a keyway in such a manner that it cannot be readily removed by an unauthorized person, I make additional provisions for properly placing the plug in the keyway, although I also may make use of the ordinary engagement of the tumbler in a depression of the plug, from which the plug may readily be released.

Under these considerations and with such objects in mind and in view of further objects which will be brought out more clearly in the following description, I submit in the following an exemplary showing of specific executions of my invention, which are illustrated by the accompanying drawing, in which

Fig. 1 shows a cross-sectional cylinder keyway lock, in which a plug of my invention is inserted, and in which a skeleton key of my invention is being inserted.

Fig. 2 shows an end view of the lock.

Figs. 3, 4 and 5 show side views of various modifications of the plugs of my invention, said plugs being in profile shaped like any ordinary key, for instance to fit the profile of the keyway of Fig. 2.

Fig. 6 shows, in a side view, one modification of a key used in connection with my invention.

Fig. 7 shows an end view of such a key.

Figs. 8 and 9 show the inserted section of another modification of such a key in a rear and sectional end view. The line along which the section of Fig. 9 is taken is indicated by a dot-dash line in Fig. 8.

Similar numerals refer to similar parts through the various views.

In Figs. 1 and 2 are indicated a stationary cylinder lock comprising the cylinder 11, rotatable barrel 12, keyway 13, tumblers 15 and tumbler pressure pin assemblies 14. Only such parts of the lock are shown as are deemed necessary for the purpose of explaining the present invention. The keyway is shown to extend clear as a lateral slot through the barrel so that a small part of the shoulder 16 in the cylinder shows from the outside at the bottom of the keyway.

The plug P has the profile and substantially the outline of a blank fitting the keyway in question, from which the bow and collar have been removed. It is shown to be provided with a notch 17, into which drops one or the other tumbler, so that the plug P is withdrawably retained in the key hole.

As known to those acquainted with this art

there are tumbler locks into which the key is inserted against a stop in the back, and there are other locks in which the keyway extends clear through. The second type being the one exemplarily shown in Figs. 1 and 2, a hook 18 is provided on the web 19, which represents the larger front on one side of the plug. The hook 18 is of such size, that it is accommodated in the lock,—at least flush with, preferably disappearing slightly below the front face of the lock,—in the part of the keyway which extends over shoulder 16. Thus it serves to prevent insertion of the plug of a greater depth than that to which a key would ordinarily be inserted into the keyway; in other words it takes the place of the collar.

Such a collar is not necessary when the keyway is closed at the back. In such an instance the modification Q of Fig. 4 could be used.

Finally it must be mentioned that the skeleton plug may also be made without the web 19, which modification takes the appearance of plug R of Fig. 5.

The notched front of the plug, which faces the tumblers, also extends from the solid end as a web 20. That web is inwardly tapered back towards the clearances accommodating the key K, so that the key is guided into a position between the webs 19 and 20. The taper is indicated in the drawing as a rounded off portion 21.

There is a recess 22 in the web 20 near the base thereof, said recess being directed towards the tumblers. Into the said recess fits the bit 23 of the key K, when said key is inserted into the keyway in which said plug is contained. In the manner of any ordinary key, the collar 24 stops the key K when it is inserted into the proper depths.

It will be noted that the key K is fluted in a manner matching the profile of keyway 13. The key K will therefore have to be inserted at the proper height of the keyway in order to be able to enter thereupon. The plug P, Q or R is of course pushed into the keyway in the manner any key is inserted therein and it is pushed therein until it either strikes the bottom of the key hole or until the hook 18 stops it, the plug being in that instance completely accommodated and concealed in the keyhole.

Since there is a certain play in all directions on a key blank in respect to the keyway, such play being also present in the instance of my plugs, the plug will be pressed by the tumblers onto the bottom of the keyway, being predeterminedly spaced from the top of the keyway, when tumblers extend therethrough. But as to their fluting, the slot between the webs 19 and 20, and the key are not in alignment, although the key has at its bitted end substantially the width of said slot. These flutings are however in alignment when the key is substantially alignedly disposed in the keyway, and when the plug P is pressed against the tension of the tumblers onto the top of the keyway.

For that reason the key K, when inserted into the plugged key hole, will engage underneath the web 20 and will lift it into the position in which the plug P is shown in Fig. 1. The key further lifts up the plug until it is fully inserted in the key hole, when the bit 23 snaps into the recess 22. When that happens, the tumblers have pressed the plug back onto the bottom of the keyway, the key is engaged on the plug and cannot be withdrawn unless the plug comes out with it.

It is of course understood that the key itself may be tapered, in order to align itself with the plug when it assumes a slanted position upon the insertion of a key, such a slanting being indicated in the view of Fig. 6. But this may also be brought about by thinning the fluted key, such thinning being indicated in the end view of Fig. 7 at 24. Finally such thinning may be brought about by slantedly chamfering one edge of the key,—as brought out in the sectional rear view of the key, and in the section thereof of Fig. 9,—at 25.

It will be understood from the foregoing that, considering the play which a key blank normally has in a keyway, considering the play of key K, considering that the said play might be slightly exaggerated without interfering with the flutings and profile of the key, and considering further that by the tapering and chamfering of the key, as just described, a further play may be provided for and it is understood that a comparatively substantial depth of recess 22 and a correspondingly large bit 23 may be provided for, so that there is substantially no wear and tear to the parts of the keyway guard of my invention.

Although I have shown and described one form of embodiment of my invention in detail, yet I do not wish to be limited thereby, except as the state of the art and the appended claims may require, for it is obvious that various modifications and changes may be made in the form of embodiment of my invention, without departing from the spirit and scope thereof.

What I claim is:—

1. A plug adapted to be concealedly placed in the keyway of a cylinder lock and transversely pressed towards one side of said keyway by the tumblers protruding into the opposite side of said keyway, a protruding web portion on said plug on the side thereof turned away from said tumblers, and a key adapted to be inserted in said keyway along the edge of said web portion of said plug and displacing said plug in a direction substantially normal to the direction in which said key is inserted in said keyway, said key sliding off said web portion and engaging there behind, when said key is fully inserted in said keyway.

2. A plug adapted to be placed in the keyway of a cylinder lock, two webs on said plug on opposite sides of a longitudinal slot, a key fitting between said webs into said slot, and complementarily irregular and relatively engageable profiles on said key and on one of said webs.

3. A plug adapted to be placed in the keyway of a cylinder lock, two webs on said plug on opposite sides of a longitudinal slot, a key fitting between said webs into said slot, and complementarily irregular and relatively engageable profiles on said key and on the one of said webs upon which bear the tumblers of said lock, when said plug is placed in said lock.

4. A plug and a key complementarily representing a key blank fitting the keyway of a cylinder lock, a bow, stem and bit forming said key, two webs joined at their bases forming said plug, said webs being spaced apart to the combined width of said stem and bit, and a profile matching the bit of said key upon one of said webs.

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