Nov. 17, 1931. M. FALK 1,832,108

REMOVABLE PLUG FOR PIN TUMBLER LOCKS

Filed Dec. 23, 1929

Fig. 1.

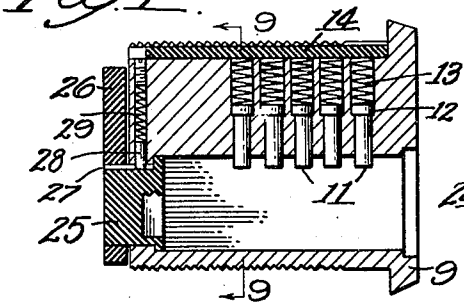



Fig. 3.

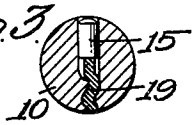



Fig. 2.

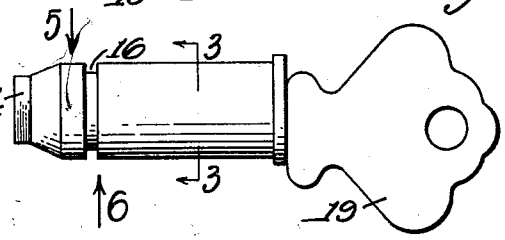



Fig. 4.

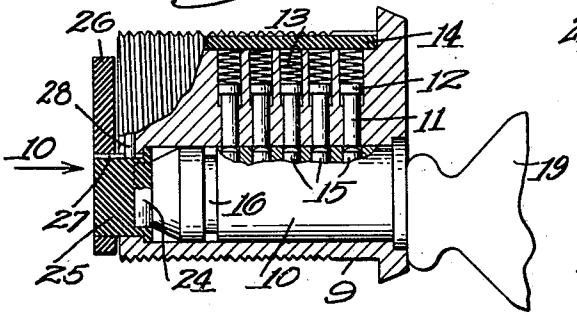



Fig. 5.

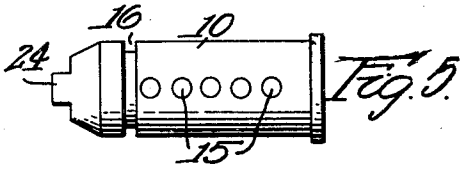



Fig. 6.

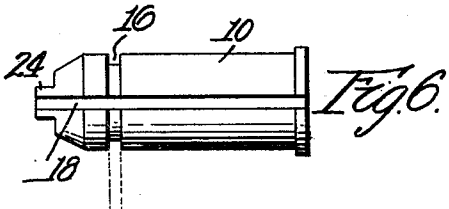



Fig. 9.

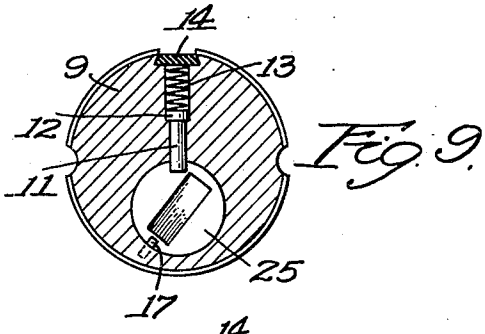



Fig. 7.

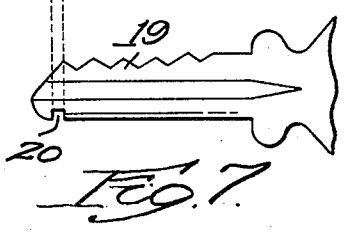



Fig. 8.

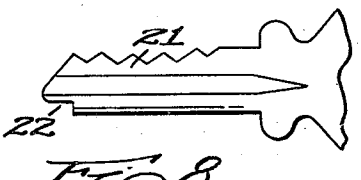
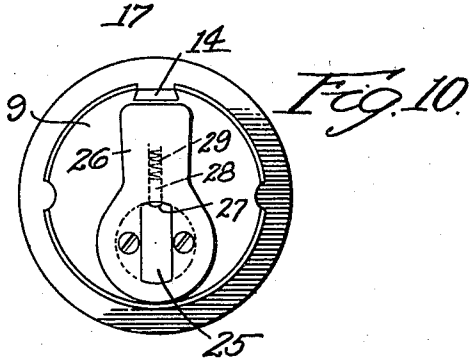



Fig. 10.

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# UNITED STATES PATENT OFFICE

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## REMOVABLE PLUG FOR PIN TUMBLER LOCKS

Application filed December 23, 1929. Serial No. 415,999.

This invention relates to a pin tumbler lock, and the principal objects thereof are to provide a plug adapted to be removed in a simple and convenient manner by the use of a special key; to provide means for holding the locking cam in the position in which it is left when the plug is removed; and to provide means for preventing removal of the plug by the use of the ordinary key.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a central longitudinal sectional view of a cylinder constructed in accordance with this invention;

Fig. 2 is a side elevation of the plug therefor;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a sectional view like Fig. 1, showing the plug in position;

Fig. 5 is a plan of the plug;

Fig. 6 is a bottom plan of the plug;

Fig. 7 is a side view of the ordinary key used in operating the lock;

Fig. 8 is a similar view of a special key used for removing the plug;

Fig. 9 is a sectional view on the line 9—9 of Fig. 1; and

Fig. 10 is an end view of the assembled parts as indicated by the arrow 10 in Fig. 4.

The lock consists of two main parts, the cylinder 9 and the plug 10. In the cylinder are the pins 11, each one having a head 12, the heads being located in radial recesses so that the pins will not drop out when the plug is removed. The usual springs 13 are employed to hold down the pins, and a plate 14 which is of tenon shape in cross section, is slid in along its groove when the pins and springs are assembled to hold them in position.

The plug 10 is provided with pins 15 as usual, operating in the ordinary way. This plug is also provided with a groove 16 around its circumference, and a pin 17 located in stationary position in the cylinder projects into this groove for preventing the removal of the plug, and this is all that does prevent it.

The plug is provided with a longitudinal groove 18 constituting part of the key slot for receiving the key 19 which is ordinarily used in the lock. This key has a notch 20 registering with the groove 16 and having metal at the back of the notch, so that when the key and the pin 17 are in engagement the latter is in this notch. At this time the key cannot be removed, and, therefore, the plug cannot be, and at other times the plug cannot be removed on account of this pin. It is necessary to turn the key to another position away from the pin to remove the key from the plug.

In order to remove the plug the key 21 has to be employed. This key has a recess 22 which is similar to the notch 20 except that the metal beyond the groove 16 is removed. Now when this key is used the plug can be turned until the pin 17 is in this recess 22, and then there is nothing to prevent the removal of the key and plug which come out together.

On the end of the plug there is the usual projection 24 which fits into a recess in the back of the member 25 which operates the cam 26. In order that the locking cam may be held in the position in which it is left when the plug 10 is removed, the member 25 is provided with a longitudinal groove 27, and into this projects a pin 28 having a spring 29 behind it and a screw plug. This pin is rounded on the end and the groove also is rounded. When the plug is turned to the position in which it can be removed by the key 21, the member 25 is also thereby turned to a position in which the pin 28 will enter the groove 27 and will remain in that position until the plug is again inserted. This leaves the door unlocked and the member 25 in the right position to receive the projection 24 when the plug is again inserted.

It will be seen, therefore, that by this construction the ordinary locking and unlocking operations are performed by a single key 19 which is modified slightly over the ordinary key and that a key 21 exactly like it, except for the recess 22, is employed when it

is desired to remove the plug for any purpose. Also the locking cam is held in proper position, so that it will not get out of place, and the plug can be turned to its original position very easily.

Although I have illustrated and described only one form of the invention I am aware of the fact that changes can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to the exact form shown, but what I do claim is:—

1. As an article of manufacture, a lock comprising a cylinder having spring-pressed pins therein, and a plug having pins for cooperating with the pins of the cylinder, said plug having a groove around it and a key slot and said cylinder having a pin entering said groove, whereby a key with a notch in it can be inserted in the key slot to register with the groove and used for locking and unlocking, and a second key with a recess in the end registering with the groove on the front side and entirely cut away on the rear can be inserted in the key slot and used to remove the plug.

2. In a pin tumbler lock, the combination of a cylinder having spring-pressed pins, and a plug having pins cooperating therewith, the cylinder having a radial pin projecting inwardly into the opening in which the plug is located, the plug having a circumferential groove into which the pin projects to prevent the removal of the plug and having a longitudinal key-slot which extends through said groove to the end of the plug, so that the plug can be removed when this longitudinal groove registers with the inwardly projecting pin.

3. In a pin tumbler lock, the combination with a cylinder and a plug therefor, of a pin projecting into the interior of the cylinder, the plug having a circumferential groove for receiving the pin, whereby the plug can be turned to all positions, the plug also having a longitudinal keyway extending to the end thereof through said groove, whereby the plug can be removed, a cam having a cam operating member, the plug and cam having inter-engaging portions, whereby the turning of the plug will turn the cam, and means for holding the cam in the position in which it is left whenever the plug is removed, said means comprising a spring-pressed pin and a longitudinal groove in the member on which the cam is mounted.

In testimony whereof I have hereunto affixed my signature.

MORRIS FALK.