

[54] CONTROLLABLE KEY LOCK

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[58] Field of Search 70/262, 263, 264, 265, 267, 70/271, 274, 277, 279, 283, 337, 356, 364 A, 421, 268, 269, 270, 272, 273

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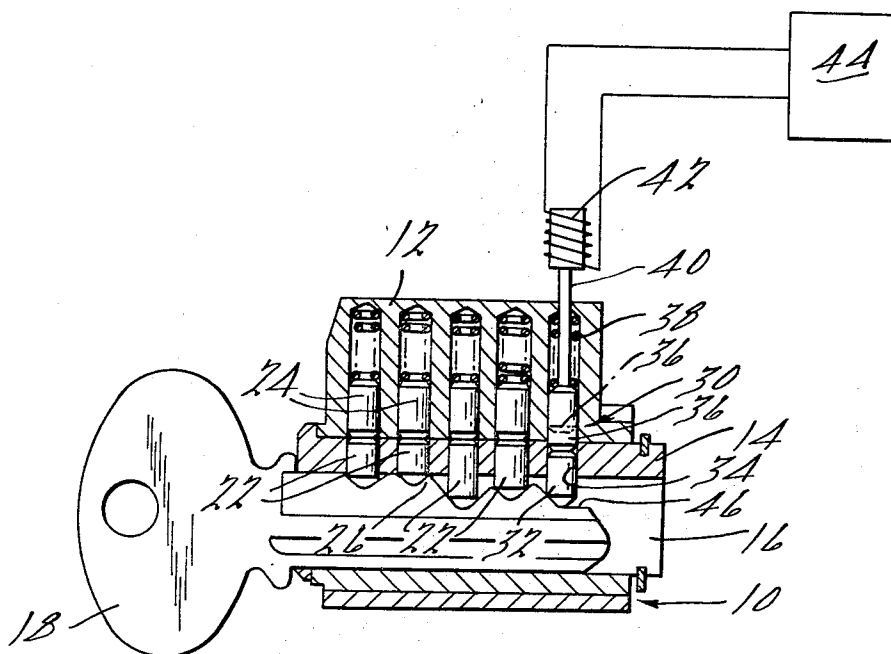
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[57]

ABSTRACT

A lock consisting of a key plug having a keyway therein, a line of conventional tumblers for locking the key plug against release movement and an auxiliary tumbler assembly located at the inner end of the line of tumblers and projecting into the keyway. A timer operated solenoid is associated with the auxiliary tumbler assembly for rendering the auxiliary tumbler assembly inoperative during selected time periods. As a result, a first key having a land engageable with the auxiliary tumbler assembly is operable to move all of the tumblers to plug release positions at all times and a second key lacking a land engageable with the auxiliary tumbler assembly is incapable of actuating the auxiliary tumbler assembly so that the second key is useful only during the selected time periods.

8 Claims, 2 Drawing Figures



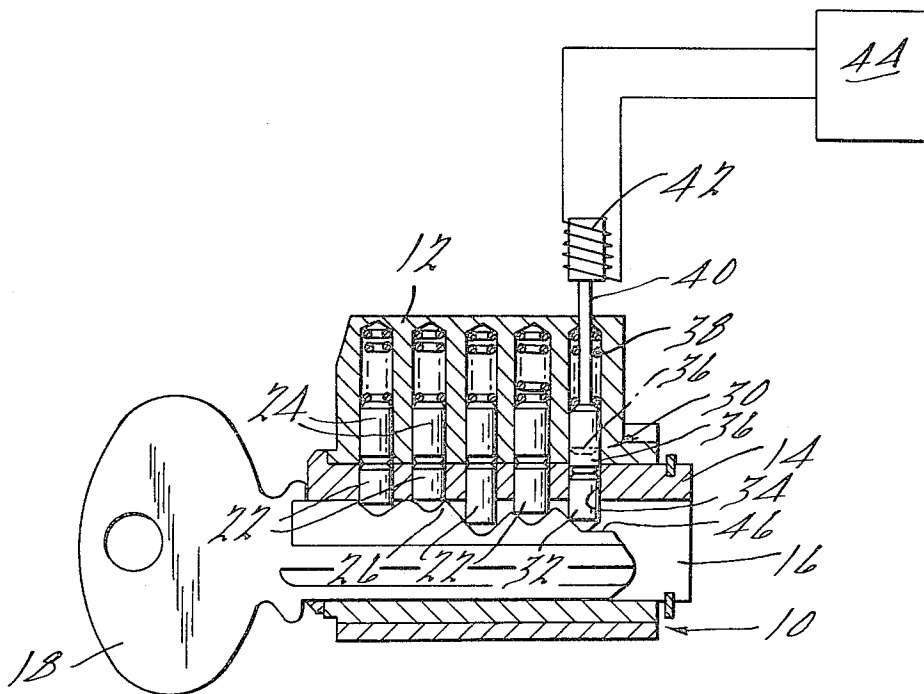


FIG. 1.

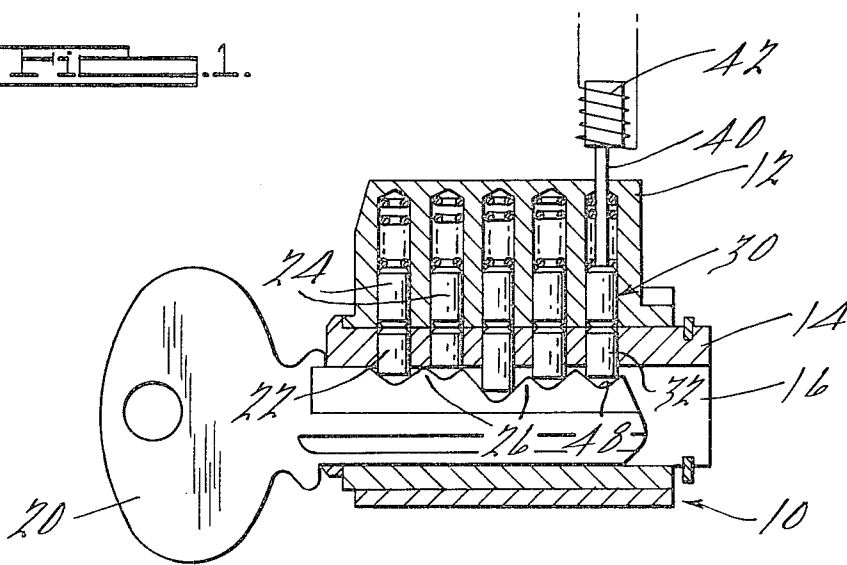


FIG. 2.

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CONTROLLABLE KEY LOCK

BACKGROUND OF THE INVENTION

It is often desirable to limit access to locked buildings and the like to certain personnel to certain time periods, while at the same time enabling access to the building by other personnel at all times. It is an object of the present invention, therefore, to provide a single lock and two keys for the lock, one of which is operable at all times to actuate the lock and the other one of which is operable only during selected time periods to actuate the lock.

SUMMARY OF THE INVENTION

The lock of this invention consists of the usual rotatable key plug mounted in a cylinder. A series of conventional tumblers are mounted in the cylinder and the plug and an auxiliary tumbler assembly is provided which is connected to a timer operated solenoid. The key plug has the usual keyway formed therein in which a key can be inserted so that the lands on the key can move the tumblers to plug release positions. When the solenoid is energized, the auxiliary tumbler assembly is rendered inoperative. Consequently, a key lacking a land engageable with the auxiliary tumbler assembly can be used to unlock the lock when the solenoid is energized. When the solenoid is deenergized, the auxiliary tumbler assembly is operative so that only a key having a land thereon of predetermined configuration engageable with the auxiliary tumbler assembly can be used to unlock the lock. As a result, some personnel associated with a given area to which access is to be restricted during certain time periods can be provided with keys lacking the land engageable with the auxiliary tumbler assembly. Keys of this type are operable to unlock the lock only during the preselected time periods during which the solenoid is energized. Other personnel can be furnished keys provided with lands engageable with the auxiliary tumbler assembly so that these personnel can unlock the lock at all times.

The principal object of the present invention, therefore, is to provide an improved selectively actuatable lock.

Further objects, features and advantages of this invention will become apparent from a consideration of the following description, the appended claims, and the accompanying drawing in which:

FIG. 1 is a sectional view of the improved lock of this invention shown in assembly relation with a solenoid and a timer and showing a restricted access key inserted in the lock; and

FIG. 2 is a sectional view of the lock of this invention showing a full access type key inserted therein.

With reference to the drawing, the lock of this invention, indicated generally at 10 is illustrated in FIG. 1 as consisting of a conventional cylinder 12 in which a key plug 14 is rotatably mounted. The key plug 14 is formed with a slot shaped keyway 16 in which both the keys 18 and 20 shown in FIGS. 1 and 2, respectively, can be inserted. A plurality of conventional pin tumblers 22 are slidably mounted in the plug 14 and are associated with conventional spring pressed driver tumblers 24 mounted in the cylinder 12. The pin tumblers 22 project into the keyway 16 so that when either of the keys 18 or 20 is inserted in the keyway 16, lands 26 of predetermined configuration on the key move the pin tumblers 22 to the positions illustrated in FIGS. 1 and 2 in which the plug 14 is released for rotatable movement within the cylinder 12. Rotation of the plug 14 operates to unlock the lock 10, as is conventional. When a key 18 or 20 is withdrawn from the keyway 16, the driver tumblers 24 are moved by the springs associated therewith to positions preventing rotatable movement of the plug 14 within the cylinder 12, as is well known in the art.

In the lock 10 of this invention, an auxiliary tumbler assembly 30 is mounted on the cylinder 12 and the plug 14 at the inner end of the line of tumblers 22 and 24. The assembly 30 consists of a pin tumbler 32 slidably mounted in an opening 34 in the plug 14 and a driver tumbler 36 engaged at one end with the pin tumbler 32 and at the other end by a spring 38 which urges the driver tumbler 36 toward the keyway 16. The driver

tumbler 36 is integrally formed with a stem 40 which projects out of the cylinder 12 and is associated with a solenoid 42 connected to a timer 44. The timer 44 is operable to energize the solenoid 42 during preselected time periods. When the solenoid 42 is energized, the driver tumbler 36 is retracted in the cylinder 12 to the broken line position shown in FIG. 1. When the driver tumbler 36 is in its retracted position, both the pin tumbler 32 and the driver tumbler 36 are incapable of preventing rotation of the plug 14 within the cylinder 12 when either of the keys 18 or 20 is inserted in the keyway 16. However, as shown in FIG. 1, when the solenoid 42 is deenergized, the spring 38 is capable of moving the driver tumbler 36 to a position in which it projects into the plug opening 34 so as to prevent rotation of the plug 14 when the key 18 is inserted in the keyway 16.

The key 18 is provided with a flat 46 that aligns with the pin tumbler 32 when the key 18 is inserted in the keyway 16. The key 20 is identical to the key 18 except for the provision thereon of an additional land 48 which is engageable with the pin tumbler 32 when the key 20 is inserted in the keyway 16. The land 48 is shaped to move the tumblers 32 and 36 to plug release positions when the solenoid 42 is deenergized. It can thus be seen that when the solenoid 42 is energized, both the keys 18 and 20 are capable of rotating the key plug 14, which constitutes unlocking of the lock 10. When the solenoid 42 is deenergized only the key 20 is capable of unlocking the lock 10.

In the operation of the lock 10 of this invention, assume that the lock 10 is installed in the front door of a building and that access to the building by certain personnel is to be limited to certain time periods while it is desirable to provide access to the building to key personnel at all times. The timer 44 is connected to a suitable source of current and is preset to energize the solenoid 42 during those time periods when access of all personnel to the building is desirable. During those time periods when only access of key personnel to the building is desired, the timer 44 operates to deenergize the solenoid 42. The key personnel are furnished with full access keys 20 and other personnel are furnished with limited access keys 18. As a result, only the key personnel can unlock the lock 10 during those time periods when the solenoid 42 is deenergized.

What is claimed is:

1. In a lock, a key plug having a keyway therein, a series of tumblers for locking said key plug against release movement, said tumblers being adapted for positioning by a key entering said keyway to release said plug for release movement, an auxiliary tumbler assembly projecting into said keyway, and means operatively associated with said auxiliary tumbler assembly for rendering said auxiliary tumbler assembly inoperative to affect release movement of said key plug at some times and operative to affect release movement of said key plug at other times, said means comprising electrically operable means capable of applying a force to said auxiliary tumbler assembly at preselected times.

2. A lock according to claim 1 wherein said last mentioned means includes a pre-settable timer.

3. A lock according to claim 1 wherein said series of tumblers is arranged in a line extending longitudinally of said keyway, said auxiliary tumbler assembly being located at one end of said line.

4. A lock according to claim 1 wherein said last mentioned means includes solenoid means operable when energized to render said auxiliary tumbler assembly inoperative.

5. A lock according to claim 1 wherein said auxiliary tumbler assembly comprises a pin tumbler slidably mounted in said plug and a spring pressed driver tumbler engaged with said pin tumbler and operable to urge said pin tumbler in a direction inwardly of said keyway and solenoid means connected to said driver tumbler and operable when energized to move said driver tumbler in a direction away from said pin tumbler.

6. A lock according to claim 5 further including first key means having a first land engageable with said pin tumbler on

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insertion of said key into said keyway and additional lands engageable with said series of tumblers on insertion of said key into said keyway, said first key land being operable to move said pin tumbler and said driver tumbler to plug release positions and said additional lands being operable to move said series of tumblers to plug release positions.

7. A lock according to claim 6 further including second key

means having lands thereon corresponding only to said additional lands.

8. A lock according to claim 7 further including timer means in circuit with said solenoid means and operable to provide for energizing of said solenoid means at preselected time periods.

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