

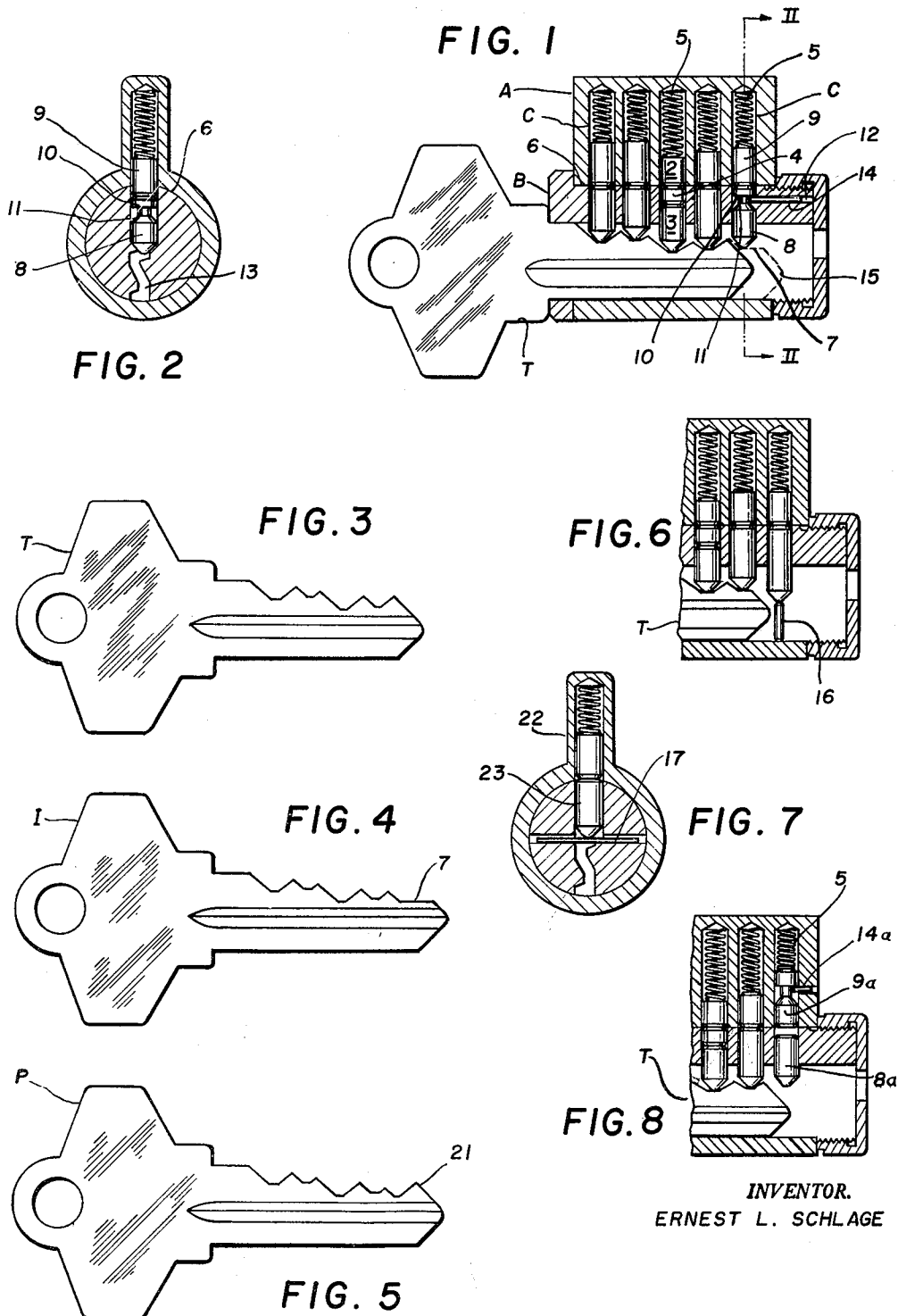
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PIN TUMBLER CYLINDER KEY SYSTEM

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PIN TUMBLER CYLINDER KEY SYSTEM
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This invention relates to a pin tumbler cylinder lock and especially to a lock which may be opened by a temporary key, and later on by a permanent key. Said permanent key, when inserted and removed from the plug, thereafter renders the temporary key inoperative.

At a certain stage during the construction of a building such as a residence, a hotel, a school, an office building, or the like, doors and key-operated locks are installed to insure the security of the building, particularly certain rooms where the tools and materials are stored. Master keys are usually issued to the contractor and to workmen such as carpenters, plumbers, electricians, and the like, during the construction period. If one or more of these keys are lost, stolen, or duplicated, and the key system is one not embodying this invention, then the security of the entire building is destroyed. If, on the other hand, a key system embodying this invention were employed, then the keys issued to the contractor and workmen would be of only temporary utility since the tenant, when taking possession of the building, or at any time he elects, can, by simply inserting his permanent key into the locks, render all keys previously issued inoperative and of no utility.

A key system of this character may also be employed when a contractor builds one or more homes for sale and gives a listing of the homes to a number of Realtors or Real Estate agents. Each agent is given a key of the temporary type so that he may show the homes to prospective buyers. When a home is sold, the contractor hands the new owner the permanent keys and, when they are inserted into the locks, all the temporary keys are thereby rendered inoperative, and neither the contractor nor the new owner need worry about collecting the temporary keys previously handed out to workmen and agents.

The key system described above in which a second key, when inserted into the lock renders the first key inoperative, may be modified so that a third key, when inserted into the lock, will render both previous keys inoperative. The system may be further extended to incorporate four, or even more, keys if such are desired by landlords or others wishing to shut out previous tenants. Such modifications, however, must be incorporated into the mechanism of the pin tumbler cylinder lock at the time of its assembly.

The object of the present invention is accordingly that of providing a pin tumbler cylinder key system in which a temporary key is used initially, and which later on is replaced by a permanent key which, when inserted and removed from the plug, renders the temporary key or keys inoperative.

Another object is to provide a pin tumbler cylinder system with three kinds of keys; first, a temporary key for the use of contractors; second, a permanent key for tenants, the initial use of which renders the temporary keys inoperative; and third, an inspection key for the use by the owner both during construction and after occupancy by the tenant.

The invention is shown by way of illustration in the accompanying drawings in which,

FIG. 1 is a central, vertical, longitudinal section of a pin tumbler cylinder lock embodying the present invention and in which a short temporary key is inserted.

FIG. 2 is a cross section taken on line II—II FIG. 1 with the exception that the pin tumblers are shown in normal or lowered position.

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FIG. 3 shows the temporary or contractor's key.

FIG. 4 shows the inspection or owner's key.

FIG. 5 shows the permanent or tenant's key.

FIG. 6 is a section similar to FIG. 1 showing the pin tumblers in the last column temporarily supported at the shear line by a breakable stilt, and

FIG. 7 is a cross section similar to FIG. 2 showing the pin tumblers in the last column supported at the shear line by a breakable cross pin.

FIG. 8 is a section similar to FIG. 1 showing a modified form of the tumbler holding means.

Referring to the drawings in detail and especially FIGS. 1 and 2, A indicates the cylinder body of a pin tumbler lock, B the plug which is rotatably mounted in the cylinder body, and C the drilled holes or columns in which the pin tumblers move. There are upper tumblers 2 and lower tumblers 3, and there may be master tumblers 4, particularly if the key system is to be masterkeyed. All the tumblers are actuated by compression springs 5 in the usual manner.

The plug has the usual longitudinal broached passage or keyway 13 formed therein for the reception of a key. In this instance, a short or temporary key, indicated at T, which actuates the tumblers of the first four columns, is employed during the construction period of a building. When this key is inserted it lifts these tumblers to the shear line of the plug indicated at 6, and as the tumblers in the fifth and last column have already been positioned on the shear line by other means, the plug may be rotated and the door opened. By referring to FIG. 3, it will be noted that the temporary key T is short and for this reason actuates the pin tumblers in the first four columns only. The inspection key indicated at I in FIG. 4 is longer than the temporary key T, but its tip 7 is flattened and slips or passes under the bottom tumbler 8 in the fifth or last column as shown by dotted lines 15 in FIG. 1, hence the long inspection key will also open the doors during the construction period. The permanent key indicated at P in FIG. 5, differs from the long inspection key I only in that a camming surface 21 is provided at its tip for the purpose of lifting the pins in the fifth or last column to an extreme height during insertion of this key whereby they are triggered or released from their holding means. Although the permanent key will operate the lock, its triggering action upon the pins in the last column results in the cylinder lock no longer responding to the temporary key. Although the temporary or construction key is rendered inoperative by the insertion of the permanent or tenant's key, the inspection or owner's key is operative both before and after the insertion of the permanent key. This is accomplished as follows.

The fifth or last column contains an upper tumbler 9 and a lower tumbler 8. A groove is formed in the lower tumbler with a shoulder 10 on one side and a beveled or camming surface 11 on its other side. A hole is drilled in the end of the plug as at 12, and a frictionally retained pin 14 is inserted during the assembly of the lock. The pin enters the groove and engages the shoulder 10, thus supporting the tumblers 8 and 9 in the position shown in FIG. 1 where the upper and lower ends of the tumblers align with the shear line of the plug. In this position the temporary keys and the owner's inspection keys will open the doors, and this position of the tumblers will in most instances be maintained until the building is completed or sold. When the tenant takes possession, his permanent key P is inserted. This is a long key with a high tip 21, and as such engages and raises the lower tumbler 8, and as this is raised the beveled surface 11 cams the frictionally held pin 14 back into the hole 12 where it is permanently retained due to its frictional fit. Upon removal of the permanent key, the tumblers 8 and 9, due

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to pressure of spring 5, will drop to their normal position where tumbler 9 intersects the shear line 6 as shown in FIG. 2. It can now be seen that the temporary key can no longer open the door and is rendered inoperative as it is too short to actuate the tumblers 8 and 9. The inspection key I, on the other hand, is not only operable during the construction period, but also after the permanent key has released the tumblers 8 and 9, as its inner flattened end 7 raises the tumblers 8 and 9 to the shear line of the plug as shown by the dotted lines 15 in FIG. 1.

If, after the permanent key has been employed, it is desired to reset the cylinder so that the temporary key can again rotate the plug, it is necessary merely to insert the inspection key and to place a rod in hole 12 and push the pin 14 back into engagement with the groove of the lower tumbler 8.

For convenience, the grooved tumbler 8 has been illustrated only in the last column of the cylinder lock. Obviously, it could be placed in the next to the last column, or in the last two columns, or in any column or columns, provided only that the combinations are so chosen that the grooved tumblers 8 are not prematurely activated by the insertion of temporary keys.

When grooved tumblers 8 are placed in more than one column, then several different permanent keys may be fashioned, each progressively or sequentially activating the individual grooved tumblers 8, thereby progressively rendering inoperative the temporary keys previously inserted into the lock.

In FIG. 1 the lower tumbler 8 is shown with a groove into which pin 14 projects to support the tumbler so that its upper face is in alignment with the shear line 6 of the plug. In FIG. 8, a modification is shown. In this instance the groove is formed in the upper pin tumbler 9^a. A pin 14^a extends into the groove and supports the tumbler 9^a with its lower face either above or in alignment with the shear line. The lower tumbler 8^a, being unsupported, drops to its lower normal position where, in this modification, it plays no part for the time being.

When the upper tumbler 9^a is held as shown in FIG. 8, the plug may be rotated by either the temporary or the inspection key; however, if the permanent key is inserted, both tumblers will be raised to a point where pin 14^a is cammed out of engagement with tumbler 9^a, and when the

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permanent key is removed, both tumblers, under the influence of the spring 5, will drop to their lowermost position where the upper tumbler 9^a intersects the shear line and prevents rotation of the plug until it is again raised by the insertion of either the inspection key or the permanent key, the temporary key having been rendered inoperative.

In FIG. 6 a modified form of holding means for the tumblers 8 and 9 is employed. This may be in the form of a stilt 16 made of a breakable or frangible material such as a plastic or pressed graphite. In FIG. 7 the tumblers 8 and 9 are supported at the shear line by a cross pin 17 made of a similar material. In either instance, when a long key is inserted, the stilt or cross pin is broken and the tumblers 8 and 9, under the action of spring 5, settle to their lower or normal position thereby rendering the short temporary key inoperative.

Having thus described my invention what I desire to claim and secure by Letters Patent is:

In a pin tumbler cylinder lock having a rotatable plug, and having columns of upper and lower spring actuated freely movable pin tumblers and one held pin tumbler, a groove formed in said held pin tumbler, said groove having a shoulder on one side thereof and a cam face on the other side, a holding pin engaging the shoulder and supporting the held pin tumbler in a position permitting rotation of the plug, said plug being rotatable by a temporary key which lifts the free tumblers in their columns to the shear line, another key for lifting the held pin tumbler to a point where its cam surface engages the holding pin and moves it out of holding position, said key when fully inserted aligning the pin tumblers in all of the columns to permit rotation of the plug, and when withdrawn permitting a tumbler in each column to intersect the shear line thereby rendering the temporary key inoperative.

References Cited in the file of this patent

UNITED STATES PATENTS

1,650,564	Wolff	Nov. 22, 1927
1,650,568	Hurd	Nov. 22, 1927
1,796,098	Hardy	Mar. 10, 1931
2,591,652	Ziegliss	Apr. 1, 1952
3,059,462	Check	Oct. 23, 1962