Oct. 12, 1965 M. T. BASSECHES 3,210,973

LOCK CONSTRUCTION

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FIG. 1

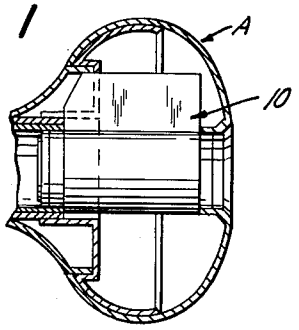
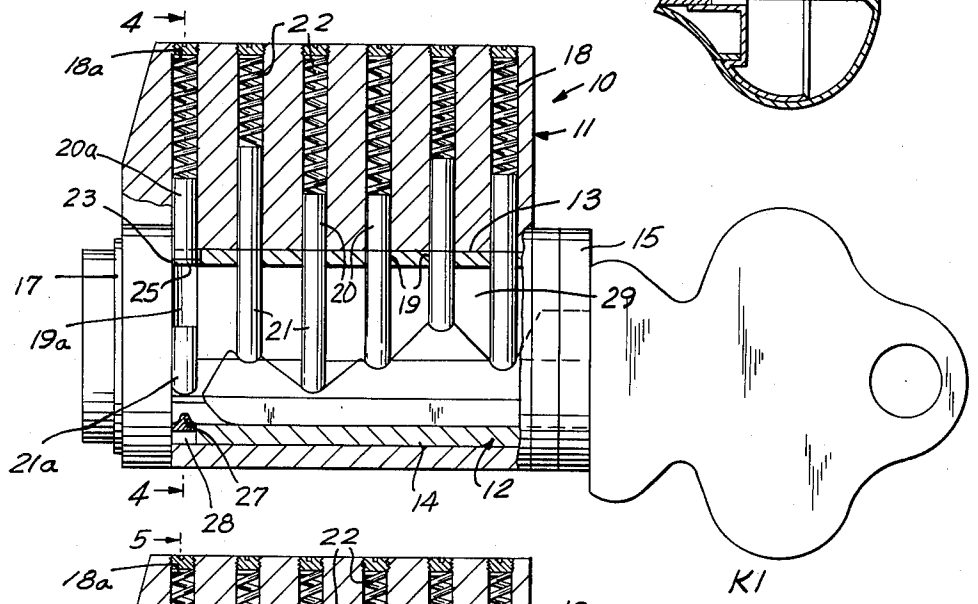


FIG. 2



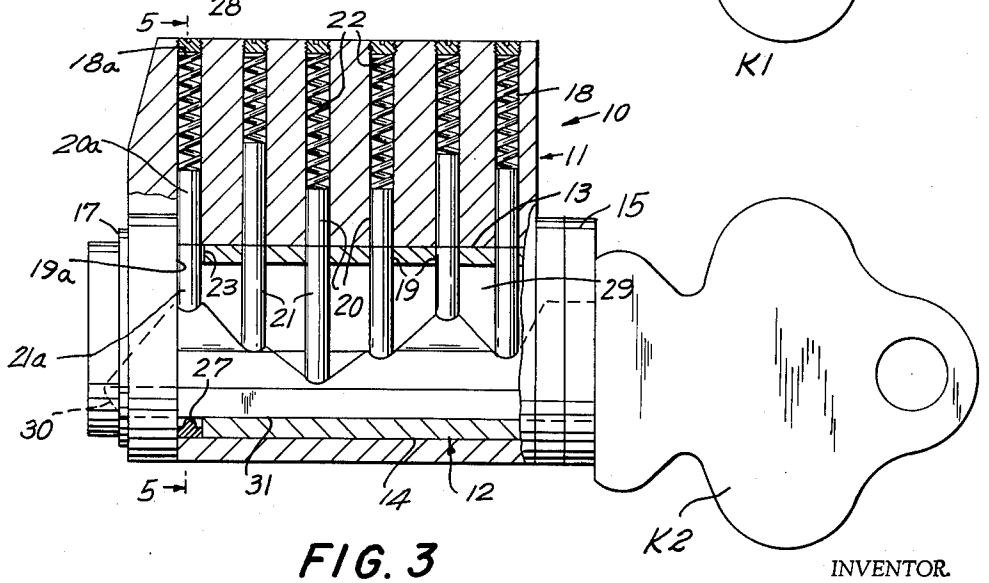


FIG. 3

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LOCK CONSTRUCTION

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FIG. 4

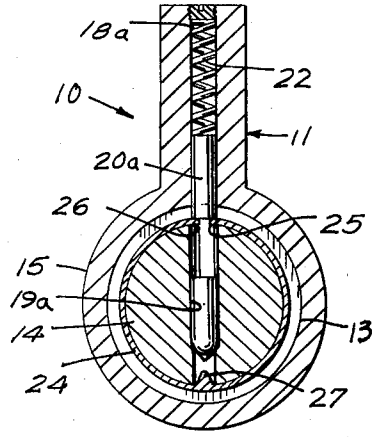


FIG. 5

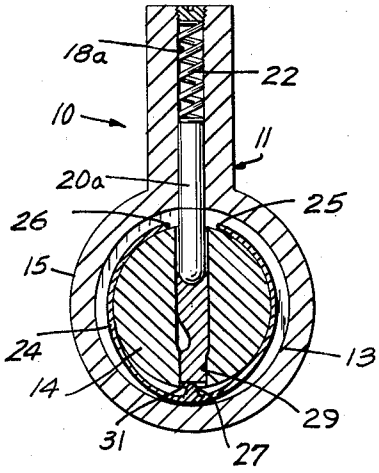


FIG. 7

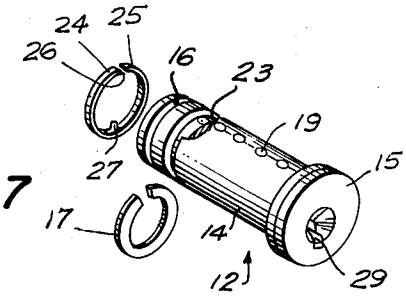
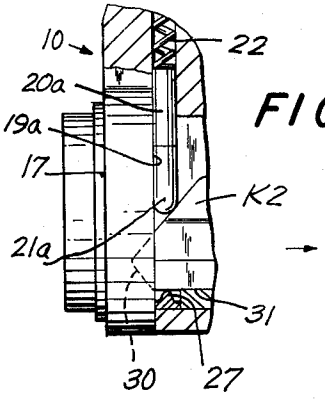


FIG. 6



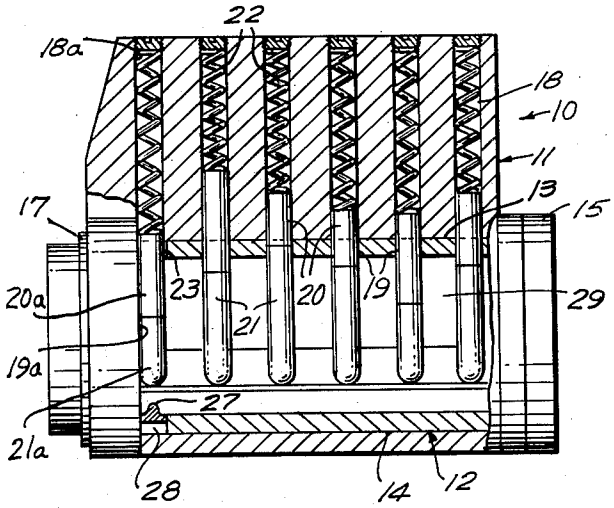


FIG 8

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3,210,973

LOCK CONSTRUCTION

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Filed Sept. 4, 1963, Ser. No. 306,441
9 Claims. (Cl. 70—383)

This invention relates to a lock construction, and more particularly to a pin tumbler lock construction, the combination of which may be changed without removal of an installed lock.

More particularly, this invention relates to a lock construction with which may be provided a first key effective to operate the lock, and change means for the lock, which change means, when inserted into the keyway, will change the pin tumbler combination in a manner to render the first key ineffective for operating the lock.

Locks of the type herein described are principally employed in newly constructed office buildings, multiple dwellings, housing developments and the like. In such situations, it is desirable to enable the premises to be locked so as to permit workmen safely to leave their tools and other valuables on the premises after the completion of the working day. When work on the premises has been completed, it is desirable that the keys formerly provided to the workmen thereafter be rendered ineffective for operating the locks, so that the ultimate occupant will be assured that the premises are secure against entry by an unscrupulous person who has kept or copied a formerly effective key.

Various methods have been proposed for effecting a combination change rendering the workman's or so-called "construction" key ineffective without the necessity for removing the lock from the door. The present invention more particularly relates to an improved lock for effecting the above noted ends. Further, the invention relates to a lock structure which enables the first key to be rendered ineffective by the use of either a tool or a key, hereinafter referred to as a "change" tool or key, which tool or key need not be effective to shift the tumblers of the lock to the release position. The advantage of such a construction will be evident.

In structures heretofore known, wherein a combination change is effected through the use of a key, the change key is in itself effective to operate the lock. Moreover, in such structures the combination change requires actual rotation of the plug. The change key of such structures is normally maintained in the possession of the builder or supervisor who would, after conclusion of the job, operate the change key in such manner as to change the combination and render the construction key ineffective. This arrangement, however, left the supervisor with a key, normally the change key, which was effective to operate the lock even after the change.

In the lock of the present invention the change key may, but is not required to be, effective to operate the lock.

Accordingly, it is an object of this invention to provide an improved lock, the tumbler combinations of which may be changed without disassembly of the lock.

Further objects of the invention reside in the provision of a simplified lock of the class described which may be manufactured with a minimum of changes from standard known locks.

Still a further object of this invention is the provision of a lock of the class described wherein the combination change, disabling an initial key from subsequent operation of the lock, may be effected by a change key or tool, which key or tool need not be effective to operate the changed combination.

Still a further object of the invention is the provision of a lock of the class described wherein, if desired, the change may be effected by a change key which will form the owner's or final key.

Still a further object of the invention is to provide a lock of the class described wherein the combination change may be effected without rotation of the plug.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, reference is made to the accompanying drawings, forming a part hereof, in which—

FIGURE 1 is a sectional view through a door knob wherein there is mounted a lock in accordance with the invention;

FIGURE 2 is a vertical section through a lock in accordance with the invention, showing a construction or temporary key inserted in the lock;

FIGURE 3 is a section similar to FIGURE 2, with the change key in position, the illustrated change key in this instance also being the owner's key;

FIGURE 4 is a section taken on the line 4—4 of FIGURE 2;

FIGURE 5 is a section taken on the line 5—5 of FIGURE 3;

FIGURE 6 is a fragmentary sectional view illustrating the position of the parts in the partially withdrawn position of the owner's key;

FIGURE 7 is a perspective view of the key plug and change component in accordance with the invention;

FIGURE 8 is a section similar to FIGURE 3 showing the position of the parts after withdrawal of the change key.

In accordance with the present invention, there is shown in FIGURE 1 a knob A wherein there is mounted a lock **10**. It will be understood that the lock need not be disposed within a knob but that other assemblies containing the lock may be employed. The lock **10** includes a stationary housing **11** and a plug **12**, rotatably mounted within the cylindrical bore **13** formed within the housing **11**. The plug **12** has the usual cylindrical body portion **14**, the outer end **15** of the plug being enlarged as respects the bore **13** to limit inward movement of the plug in respect of the housing.

The usual annular groove **16** is provided at the inner end of the body **14** of the plug, within which groove is seated snap washer **17** to maintain the plug within the housing. The housing and plug are provided, in the usual manner, with registering cross bores, the cross bore portions of the housing being denominated **18**, and the mating cross bore portions in the plug being denominated **19**. The cross bores **18** and **19** are charged in the usual manner with driver pins **20** and follower pins **21**, the same being pressed radially inwardly by springs **22**.

In accordance with the illustrated embodiment of the invention, there is formed in the plug an annular groove **23** intersecting the innermost bore or pinway **19***a*. Before insertion of the plug into the housing, there is disposed within the groove **23** a split collar **24**, preferably of generally annular configuration.

The collar **24** of the illustrated embodiment is preferably of a resilient springy material, nylon plastic being a preferred example. The collar **24** includes end portions **25**, **26** overlying the cross bore or pinway **19***a* of the plug. The collar **24** also includes an upwardly directed abutment **27** which extends through aperture **28** into the interior of the plug.

The plug, in the usual manner, is provided with a longitudinally extending keyway **29** which intersects the cross bores or pinways **19**, the keyway also intersecting the aperture **28** in which is disposed the abutment **27**. The abutment **27** is of such height as to extend within the keyway.

The end portions **25**, **26** of the collar **24** may be sligthly

inturned so that when the collar is seated within groove **23**, the inturned portions of the ends enter slightly into the pinway **19***a*.

The plug, with the collar **24** assembled thereon in the manner aforesaid, is assembled within the housing in the usual manner and locked therein through the use of split washer **17**. It will be understood that when the pinways or cross bores **18** of the housing are thereafter charged with driver and follower pins and springs, the driver pins, in all the pinways except the innermost pinway **18***a*, will be projected across bore **13** and into the pinways **19** of the plug. The driver pin **20***a*, in the innermost cross bore **18***a*, however, will be prevented from passing across the shear line and into the plug by the collar **24**, which will block the cross bore portion **19***a* of said plug.

It will be understood that the follower pin **21***a*, which is charged in the innermost cross bore, may initially be loaded into the plug before assembly of the plug in the housing, or this component may be charged with the driver pin **20***a* into the innermost pinway **18***a* of the housing. In either instance, it will be understood that the locking pins in the innermost cross bore or pinway are initially ineffective to block rotation of the plug within the housing, such locking function being initially carried out by the pins in the other pinways **18**, **19**.

As shown in FIGURE 2, the junctions of pins in all pinways except **18***a*, **19***a*, have been aligned with the shear line or inner diameter of the bore **13** by a temporary or construction key **K1**, bitted to lift the outer ends of the follower pins in such pinways to the shear line. It will be noted that the key **K1** is of such length that in the fully inserted position, the innermost end of the key does not contact the pins in the innermost pinway or the abutment **27** of the collar **24**. It will be appreciated that with the pins aligned as shown in FIGURE 2, the plug may be rotated through the use of the key **K1** to operate whatever mechanism is secured by the lock. In the course of rotation of the key **K1**, the inner end of driver pin **20***a* will ride against the outer surface of the collar **24** within groove **23** and the pins in said innermost pinway will thus present no obstacle to the operation of the lock.

It will be seen that the collar, in effect, provides blocking means for the innermost pinway, which initially prevents any pin therein from being simultaneously disposed within pinway portion **18***a* of the housing and the pinway portion **19***a* of the plug.

The combination of the lock is changed by unblocking the innermost pinway, thereby to release the pins disposed in the innermost pinway. This release may be effected by a plurality of means but is preferably accomplished through the insertion of an owner's key **K2**.

It will be observed from FIGURE 3 that the owner's key is of greater length than the construction key **K1**. When the owner's key is inserted, a downwardly directed cam surface **30** on the leading edge of said key will engage and depress the projection or abutment **27** of the collar **24** and will thereby urge the latter generally radially outwardly of said keyway. The under surface **31** of the key **K2** will maintain this abutment in the downwardly depressed position aforesaid. As a consequence of the downward movement of the abutment **27**, the collar **24** will be distorted or spread from the generally annular position shown in FIGURE 4 to the slightly oval position shown in FIGURE 5, the distortion being accompanied by a spreading of the end portions **25**, **26** of the collar. Where the edges **25**, **26** are slightly inturned, as shown in FIGURE 7, a somewhat greater than ordinary force may be required to insert the key, thus clearly indicating to the operator that the combination change is being effected.

It will be readily recognized that where the end portions of the collar are thus spread apart, the pinway **19***a* of the plug will be unblocked and the driver pin **20***a* (or the driver and follower pins, if both are charged into the housing) will be released and activated. When the key **K2** is thereafter withdrawn, the driver pin **20***a* will, like the other driver pins, lie across the shear line and join with such other pins in providing the locking function.

It will be appreciated that if key **K1** is thereafter inserted into the lock, the pins in the pinways **18** and **19** will be aligned at the shear line but the driver pin **20***a* will be disposed within both of the cross bores **18***a*, **19***a*, and thereby will prevent operation of the lock by the key **K1**.

Subsequent use of the key **K2**, which is bitted to align all of the outer edges of the follower pins with the shear line, will be effective to operate the lock after change.

While the activation of the pins in the innermost pinway has been described as effected by a key **K2**, bitted to operate the plug, it will be readily recognized that any change tool capable of insertion into the keyway in a position to depress the abutment or projection **27** would be equally effective in releasing the pins in the last mentioned pinway. Preferably, the change tool or the abutment or both are provided with cam surfaces to effect the desired movement of the abutment.

It will thus be observed that the combination change may be effected without providing the person making such combination change with a key capable of ultimately operating the lock.

It may further be noted that the collar **24**, where made of a springy material, will have the tendency to return to its initial position wherein the ends **25**, **26** are closely spaced with respect to each other. However, once the pins in the innermost pinway have been activated, they will prevent the collar from returning to blocking position of said pinway. Moreover, the slight pressure which may be exerted by the ends **25**, **26** against the pins in the innermost pinway is relieved each time a key capable of operating the lock is inserted in the keyway, since upon each such insertion, the key serves to depress the abutment **27**, thereby spreading the ends **25**, **26**.

Also, the danger of the ends **25**, **26** pinching against the pins and preventing radial shifting thereof as the key is withdrawn is prevented by the fact that the abutment **27** is maintained depressed by the lower edge **31** of the key until the follower pin **21***a* has been pressed by spring **22** across the shear line, as shown in FIGURE 6.

It will be understood that more than one pinway may be provided with blocking means and that progressive release of the pinways may be effected, to enable a series of combination changes to be effected.

It will be further understood by those skilled in the art that the present invention is not limited to the use of an annular blocking member. In the light of the present disclosure, other blocking means will readily suggest themselves to those skilled in the art. Accordingly, the invention is to be broadly construed within the scope of the appended claims.

Having thus described the invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. A lock having a housing with a main bore, a plug rotatably mounted in said bore and having a longitudinally extending keyway, first and second cross bores extending radially from said housing into said plug and intersecting said keyway, locking pins in said cross bores, spring means in said cross bores pressing a locking pin of said first cross bore into spanning position of the shear line defined by the outer periphery of said plug and said main bore, a pin hold back member seated in said plug and having a blocking portion interposed in blocking position of said second cross bore, said blocking portion in said blocking position preventing a pin in said second bore from being simultaneously disposed within the cross bore portions of said housing and said plug, a release abutment operatively associated with said hold back member lying within said keyway, radial movement of said release abutment outwardly of said key-

way being effective to shift said portion of said pin hold back to unblocking position of said second cross bore.

2. A lock having a housing with a main bore, a plug rotatably mounted in said bore and having a longitudinally extending keyway, first and second cross bores extending radially from said housing into said plug and intersecting said keyway, locking pins in said cross bores, spring means in said cross bores pressing a locking pin of said first cross bore into spanning position of the shear line defined by the outer periphery of said plug and said main bore, a groove formed in the periphery of said plug in communication with said second cross bore, pin hold back means movably mounted in said groove, said hold back including a pin stop portion shiftable in said groove between blocking and clearing position of said second cross bore, said hold back means including an abutment portion lying within said keyway, movement of said abutment portion relative to said plug being effective to shift said stop portion from said blocking to said clearing position, a first key bitted to shift the pins of said first cross bore to unlocking position, said first key being sized to prevent operative engagement with said abutment portion upon insertion of said key into said keyway, and combination change means insertible into said keyway, said change means and abutment including cooperative cam and follower portions sized, upon longitudinal movement of said change means into said keyway, to engage and shift said abutment portion relative to said keyway and thereby shift said pin stop portion to said clearing position, thereby to admit a pin in said second cross bore into said plug.

3. A lock having a housing with a main bore, a plug rotatably mounted in said bore and having a longitudinally extending keyway, first and second cross bores extending radially from said housing into said plug and intersecting said keyway, locking pins in said cross bores, spring means in said cross bores pressing a locking pin of said first cross bore into spanning position of the shear line defined by the outer periphery of said plug and said main bore, a groove formed in the periphery of said plug communicating with said second cross bore, a parti-annular spring member seated in said groove and including a pin blocking portion interposed in pin blocking position of said second cross bore, said blocking portion preventing a pin in said second cross bore from being simultaneously disposed within the cross bore portions of said housing and plug, an abutment on said spring member disposed within said keyway, keying said spring member to said plug, movement of said abutment outwardly of said keyway being effective to shift said pin blocking portion to clearing position of said cross bore, and key means bitted to shift the pins of said first and second cross bores to unlocking position, said key means in the inserted position thereof being of a length to move said abutment outwardly of said keyway.

4. In a pin tumbler lock having a plurality of pinways charged with spring pressed driver and follower pins, a plug, a discontinuous collar disposed about the periphery of the plug and blocking at least one pinway of said plug, said collar having a projecting portion extending from said collar into the keyway of said plug, movement of said projecting portion outwardly of said keyway being effective to move said collar to unblocking position of said plug, first key means bitted to align the pins in all but said blocked pinway in unlocking position, said first key means being sized to clear said projecting portion in the fully inserted position thereof, and second key means bitted to align the pins in all said pinways in the unlocking position, said second key means being sized, in the fully inserted position, to engage said projecting portion of said collar and shift the same radially and thereby unblock said one pinway.

5. In a pin tumbler lock having a plurality of pinways charged with spring pressed locking pins, a plug, spring means disposed at least partially about the periphery of the plug and having a portion blocking at least one pinway of said plug, a projecting portion extending from said spring means into the keyway of said plug, first key means bitted to align the pins in all but said one pinway in unlocking position of said plug, whereby said plug may be rotated, a pin in said one pinway riding against said spring means upon rotation of said plug, said first key means being sized to clear said projecting portion and second key means bitted to align pins in all of said pinways in unlocking position, cooperative cam and follower portions formed on said second key means and said projecting portion positioned to be engaged upon insertion of said second key means into said plug and thereby shift said spring means to unblocking position of said one pinway, whereby a pin thertofore disposed against said spring means is projected into said plug.

6. A lock having a housing with a main bore, a plug rotatably mounted in said bore having a longitudinally extending keyway, first and second cross bores extending radially from said housing into said plug and intersecting said keyway, locking pins in said cross bores, spring means in said cross bores pressing a locking pin of said first cross bore into spanning position of the shear line defined by the outer periphery of said plug and said main bore, an annular groove formed in the periphery of said plug in communication with said second cross bore, a split collar seated in said groove and including a portion overlying said second cross bore portion of said plug, a locking pin in said second cross bore portion of said housing biased against the outer surface of said collar, an abutment portion operatively associated with said collar and extending into said keyway, said abutment portion being positioned to spread said collar to clearing position of said second cross bore upon transverse movement of said abutment portion in respect of said keyway, a first used key bitted to align the junction between adjacent locking pins in said first cross bore with said shear line, whereby said plug may be rotated with a locking pin of said second cross bore riding on said collar, said first key being sized to provide clearance with respect to said abutment, and combination change means insertible into said keyway and sized to shift said abutment transversely with respect to said keyway and thereby clear said collar from blocking position of said second cross bore without the necessity for rotating said plug.

7. A device in accordance with claim 6 wherein said collar comprises a resilient plastic material and said abutment is integrally formed with said collar and extends through an aperture in said plug whereby said collar is keyed to rotate with said plug.

8. A device in accordance with claim 6 wherein said projecting portion and combination change means include cooperative cam and follower elements positioned to be engaged upon insertion of said change means into said keyway.

9. A lock having a housing with a main bore, a plug rotatably mounted in said bore and having a longitudinally extending keyway, first and second cross bores extending radially from said housing into said plug and intersecting said keyway, locking pins in said cross bores, spring means in said cross bores pressing a locking pin of said first cross bore into simultaneous disposition in the housing and plug portions of said first cross bore, spring blocking means biased into blocking position of said second cross bore, whereby movement of locking pins from said housing into said plug of said second cross bore is prevented, abutment means biased by said spring blocking means into said keyway, outward movement of said abutment means with respect to said keyway being effective, without rotation of said plug, to shift said spring blocking means to clearing position of said second cross bore, and change means insertible in said

keyway for shifting said abutment means outwardly of said keyway, thereby to clear said spring blocking means from said second cross bore, whereby a pin of said second cross bore is biased by said spring means from said housing into said plug, the pins in said second cross bore preventing said spring blocking means from returning to blocking position of said second cross bore after removal of said change means.

References Cited by the Examiner

UNITED STATES PATENTS

3,059,462	10/62	Check	70—384
3,099,151	7/63	Schlage	70—383
3,172,284	3/65	Crandell et al.	70—383

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