Oct. 17, 1967 T. J. LUNA ETAL 3,348,220

SELECTIVELY SIGNALLING DEVICE FOR PIN-TUMBLER LOCK

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FIG. 1

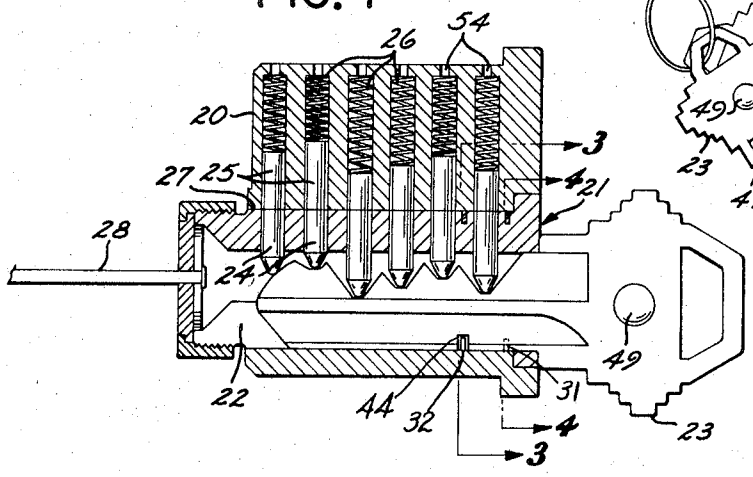


FIG. 2

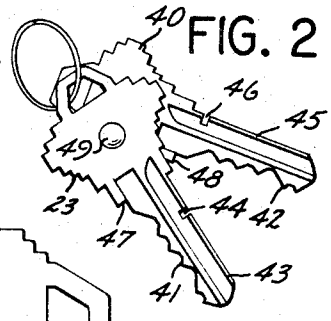


FIG. 4

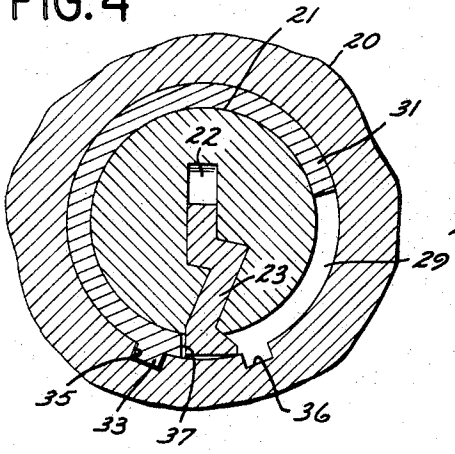


FIG. 3

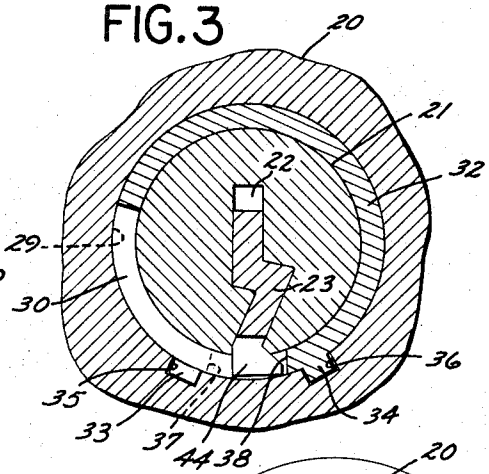


FIG. 5

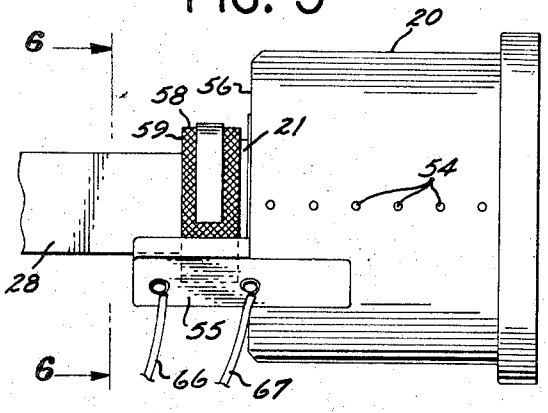
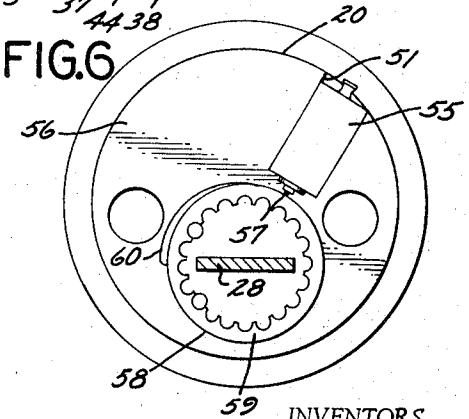


FIG. 6



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SELECTIVELY SIGNALLING DEVICE FOR PIN-TUMBLER LOCK

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FIG. 21

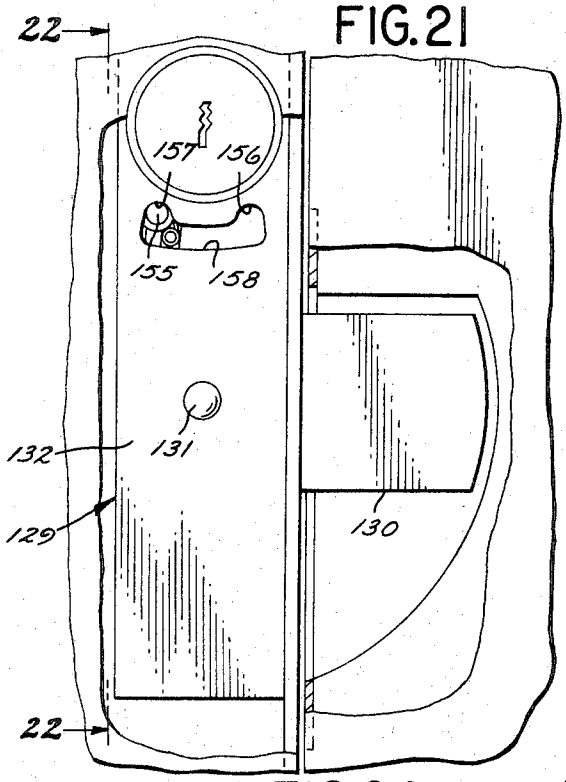


FIG. 22

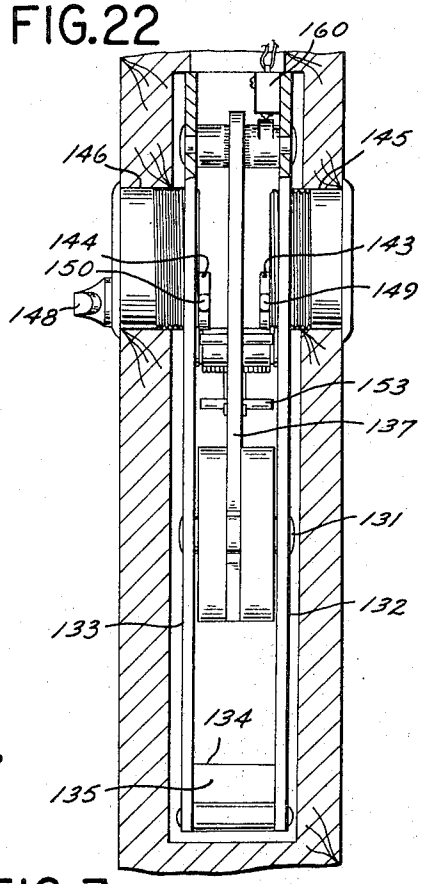


FIG. 24

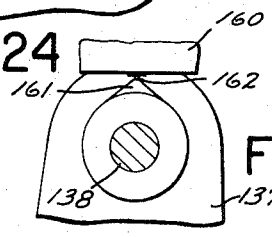


FIG. 23

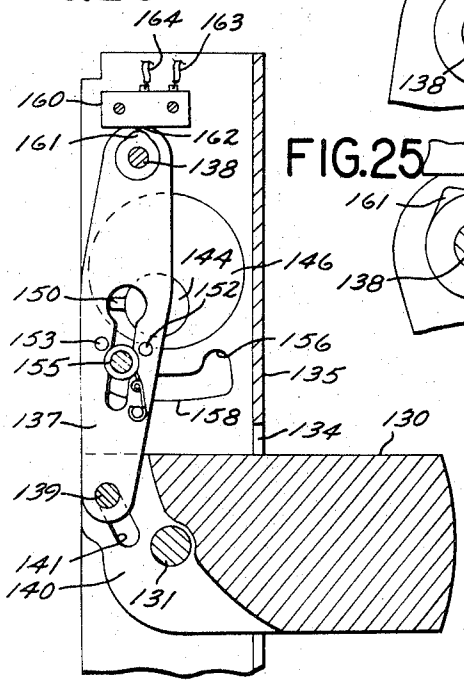


FIG. 25

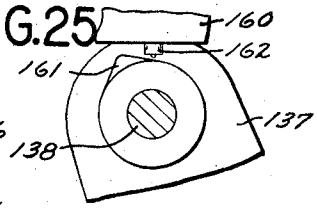


FIG. 7

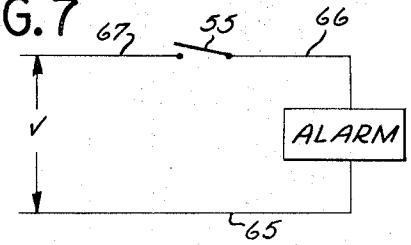
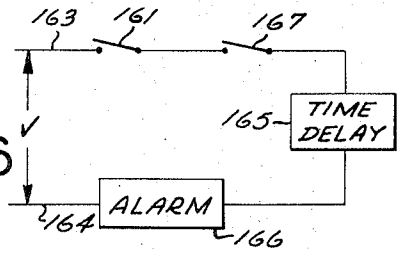


FIG. 26



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SELECTIVELY SIGNALLING DEVICE FOR PIN-TUMBLER LOCK

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FIG. 18

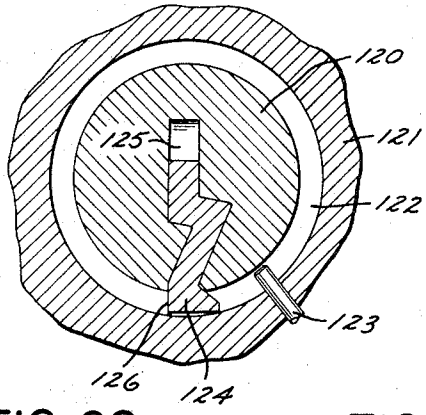


FIG. 19

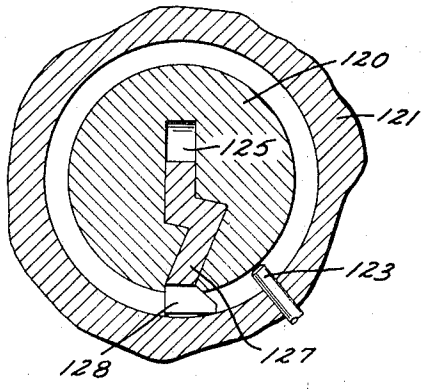


FIG. 20

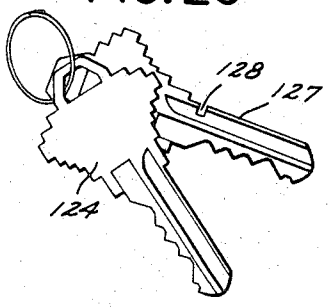


FIG. 8

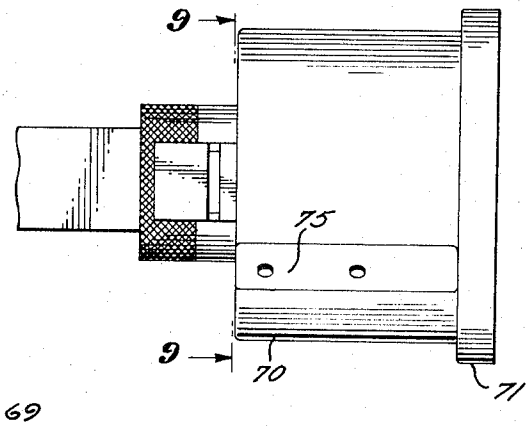


FIG. 9

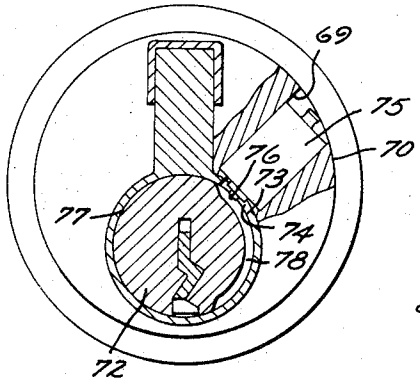


FIG. 10

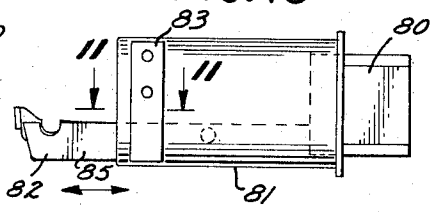
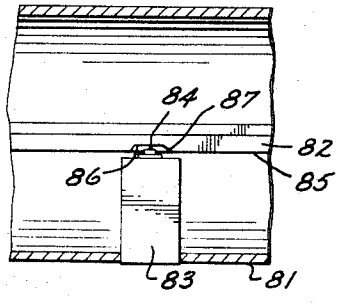


FIG. 11



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SELECTIVELY SIGNALLING DEVICE FOR PIN-TUMBLER LOCK

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FIG. 16

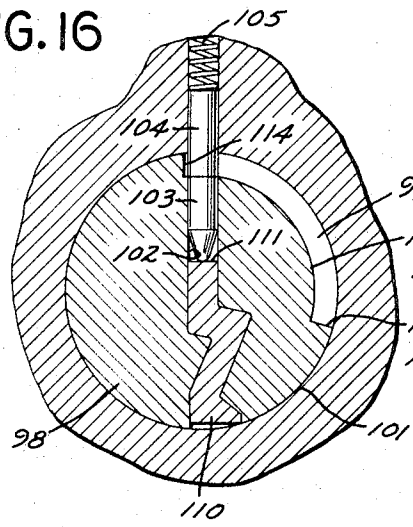


FIG. 17

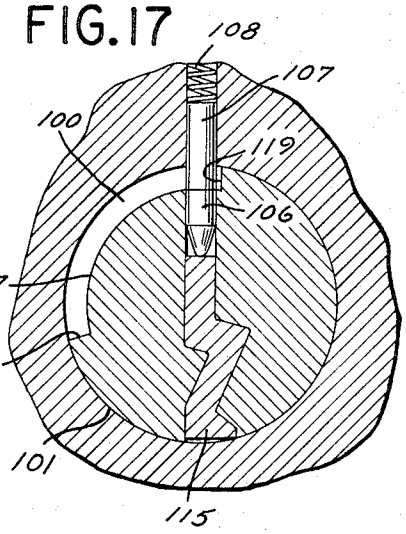


FIG. 12

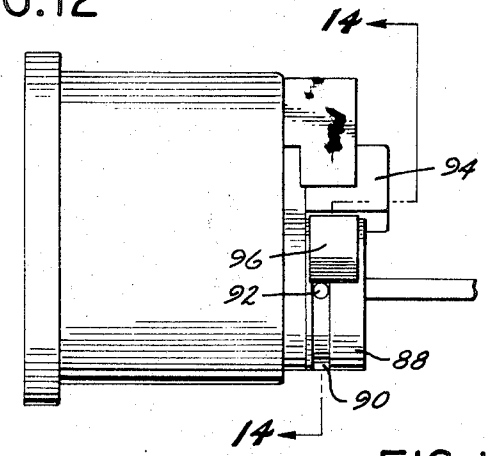


FIG. 13

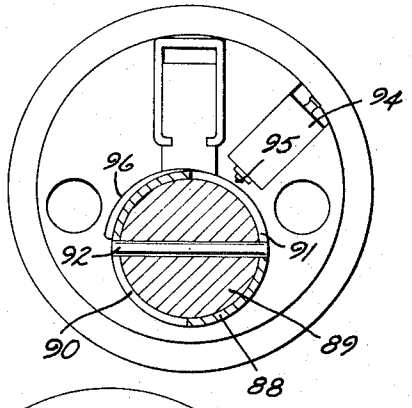


FIG. 14

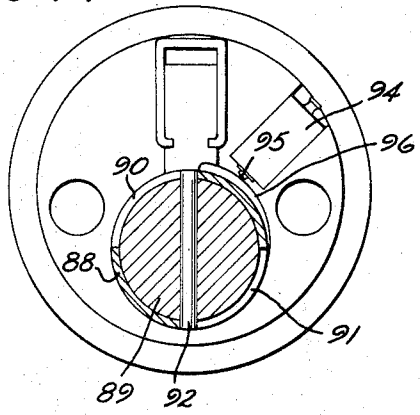
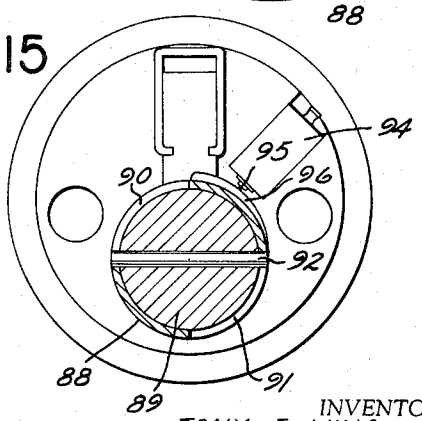


FIG. 15



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United States Patent Office 3,348,220 Patented Oct. 17, 1967

3,348,220

SELECTIVELY SIGNALLING DEVICE FOR PIN-TUMBLER LOCK

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Filed Dec. 21, 1964, Ser. No. 419,783
4 Claims. (Cl. 340—274)

This invention provides for selective operation of a lock to give it controlled action or to activate an alarm when the lock is opened by an unauthorized person.

According to the arrangement of this invention, a pin-tumbler lock can be made to rotate only in one direction by one key, while being permitted to turn solely in a different direction by another key. Also, the lock may be constructed to rotate through different arcs, depending upon which key is utilized. This lock arrangement may be incorporated in an alarm system where rotation of the lock in one direction is made to actuate the alarm, while turning it in the other will give normal operation. In another version, one key will permit 360° rotation of the lock so that an automatic spring latch can be neutralized. A second key can turn the lock only through an arc of less than 360° so that the spring latch cannot be neutralized. Beyond these examples, there are many variations possible in the types of selective lock operation permitted by this invention. In accomplishing these results, the lock is provided with stop members extending through the cylinder to the vicinity of the core, and the keys are given notches in predetermined locations. A key appropriately notched will clear one or more of the stop elements, while one with a notch in a different location or without a notch will be prevented from turning by a stop.

An object of this invention is to provide for the selective operation of a lock.

Another object of this invention is to provide an alarm system for locks.

A further object of this invention is to provide a lock that can be turned in different ways through the use of different keys.

An additional object of this invention is to provide a selectively operable lock of dependable operation, yet of economical manufacture requiring minimum modification of existing lock construction.

These and other objects will become apparent from the following detailed description taken in connection with the accompanying drawing in which:

FIGURE 1 is a longitudinal sectional view of a pin-tumbler lock embodying the invention;

FIGURE 2 is an elevational view of the keys for use in the lock of FIGURE 1;

FIGURE 3 is a transverse sectional view taken along line 3—3 of FIGURE 1, showing the relationship of one of the keys and the stops;

FIGURE 4 is a transverse sectional view taken along line 4—4 of FIGURE 1, further illustrating the key and stop arrangement;

FIGURE 5 is a plan view of the lock of FIGURE 1, showing the position of the cam and switch for activating an alarm or the like;

FIGURE 6 is a transverse sectional view taken along line 6—6 of FIGURE 5;

FIGURE 7 is a wiring diagram of the alarm system activated by selective rotation of the lock;

FIGURE 8 is a plan view of a lock with a different cam arrangement for tripping the switch of the alarm system;

FIGURE 9 is a transverse sectional view taken along line 9—9 of FIGURE 8, illustrating the details of the cam and switch mounting;

FIGURE 10 is a side elevational view showing the invention as applied to a bolt;

FIGURE 11 is an enlarged fragmentary longitudinal sectional view taken along line 11—11 of FIGURE 10, illustrating the arrangement for tripping the switch by movement of the bolt;

FIGURE 12 is a plan view of a lock arrangement of the lazy cam type incorporating the principles of this invention;

FIGURES 13, 14 and 15 are end elevational views of the lock of FIGURE 12 with the lazy cam in different rotational positions;

FIGURE 16 is a transverse sectional view of a modification in which the selective operation of the lock is accomplished by a groove and a pin and driver set of the lock;

FIGURE 17 is a transverse sectional view of the lock of FIGURE 16 taken at a different axial position of the lock;

FIGURE 18 is a transverse sectional view of a lock using a different type of stop and constructed to allow rotation of 360° by one key and of a lesser arc by a second key shown positioned in the lock;

FIGURE 19 is a transverse sectional view of the lock of FIGURE 18 with the key for full rotation inserted; and

FIGURE 20 is an elevational view of the keys used with the lock of FIGURES 18 and 19;

FIGURE 21 is a side elevational view of a maximum security type lock utilizing the invention;

FIGURE 22 is an end elevational view of the lock of FIGURE 21;

FIGURE 23 is a sectional view of the lock taken along line 23—23 of FIGURE 22;

FIGURE 24 is an enlarged fragmentary view of the cam arrangement for actuating the switch of the alarm system;

FIGURE 25 is a view similar to FIGURE 24 with the cam in a different position; and

FIGURE 26 is a wiring diagram of an alarm system used in connection with the lock arrangement of FIGURES 21 through 25.

With reference to the drawing, there is seen in FIGURES 1, 2, 3 and 4 a pin-tumbler lock including a cylinder **20** within which is rotatable the core **21** having a broached hole **22** to receive a key **23**. The cylinder and core cooperate to retain pins **24** and drivers **25**, biased inwardly toward the opening **22** by means of compression springs **26**. In the usual manner, the proper key for the lock will elevate the pins **24** to a point where the juncture between the pins and the drivers lies at the shear line **27** between the core and cylinder. This is the position shown in FIGURE 1. When this is done, the core can be rotated within the cylinder so that the tail piece **28** actuates an associated latch mechanism, not shown.

According to the arrangement of this invention, the core **21** is provided with a pair of axially spaced circumferential grooves **29** and **30** in its periphery. Within these grooves are arcuate pieces **31** and **32** that have a radial dimension substantially the full depth of the grooves. The arcuate members **31** and **32** extend for less than 360° and do not interfere with the key opening **22** when the core is centered relative to the cylinder prior to actuating the lock. The arcuate members **31** and **32** include outwardly extending tabs **33** and **34**. These project into axially extending slots **35** and **36**, respectively, formed in the inner circumferential wall of the cylinder **20**. This positions the arcuate members **31** and **32** so that they cannot rotate relative to the cylinder. The arcuate members **31** and **32** are located by this arrangement so that they present end surfaces on either side of the key opening **22**. In other words, the end wall **37** of the members **31** is on the left side of the opening **22** in the sectional view of FIGURE 3, while the end wall **38** of the arcuate members **32** is on the right-hand side of this opening.

Two keys are provided for the operation of this lock. Both the key **23** and the accompanying key **40** have the same pattern on their edges **41** and **42** that engage the pins **24**. Consequently, either of these keys will raise the pins to the shear line **27** of the lock so that the core may be turned relative to the cylinder.

The opposite edge **43** of the key **23** is provided with a notch **44**. Similarly, the edge **45** of the key **40** has a notch **46**. The notch **44** is spaced farther from the shoulder **47** of the key **23** than is the spacing of the notch **46** from the corresponding shoulder **48** of the key **40**. The notch **44** is positioned so that, when the key **23** is inserted into the broached hole **22** so that the shoulder **47** engages the end of the core **21**, the notch **44** is in registry with the arcuate member **32**. This may be seen by reference to FIGURES 1 and 3. When the key **40** is fully inserted in the lock, on the other hand, its notch **46** becomes aligned with the other arcuate member **31**. This results in the selective operation of the lock.

It can be seen that when the key **23** is fitted into the lock it can be turned in only one direction. This is because the arcuate member **31** acts as a stop and prevents it from rotating in the opposite direction. Thus, as seen in FIGURE 4, it is impossible to turn the key clockwise because the side of the key will strike the end edge **37** of the arcuate member **31**. However, the notch **44** registers with the other arcuate member **32**. Consequently, rotation of the key in the counterclockwise direction is permitted. As this movement occurs, the core rotates relative to the cylinder in the usual manner, and the arcuate members **31** and **32** slide within the annular grooves **29** and **30** as the core turns.

While the key **23** provides for counterclockwise rotation of the core, the other key **40** permits only clockwise turning of the core. This is because, when the key **40** is inserted in the lock, the notch **46** registers with the annular member **31**, but the end wall **38** of the annular member **32** will strike the side of the key to prevent rotation in the counterclockwise direction. Thus, according to this construction, selective rotation of the lock is accomplished by use of the appropriate key.

A typical use for this lock construction is in connection with an alarm system. Normal operation of the lock may be by one of the keys, such as the key **23**, by which the associated latch mechanism is opened through counterclockwise rotation. However, some alarm device will be provided in the system to transmit a signal when the other key **40** is used and the lock is turned in the clockwise direction. Thus, if a person is forced to surrender a key to a thief, he will provide the thief with the key **40**. This will open the associated latch mechanism, which operates by being turned in either direction, so that the thief will be unsuspecting. However, it also will sound an alarm so that help can be dispatched. Of course, there will be some unobtrusive marking provided on the different keys,

such as for example a button **49** on the key **23**, to permit them to be readily distinguished by the normal users.

One arrangement for utilizing the selectively operable lock of this invention in an alarm system is illustrated in FIGURES 5 and 6. Here, an opening **51** extends inwardly from the outer circumferential surface **52** of the cylinder **20**. This opening is formed at one side of the drivers which are beneath the row of pilot holes **54**, so that the inner mechanism of the lock is not affected. Into the opening **51** is inserted a switch **55**, which may be bonded in place or otherwise appropriately secured. A portion of the switch **55** projects beyond the radial end wall **56** of the cylinder. Consequently, the actuating arm **57** of the switch is located adjacent the knurled cylindrical surface **58** of the threaded collar **59** that holds the tail piece **28** to the core **21**. On the surface **58** of the collar **59** there is provided an upwardly inclined cam **60**. The cam surface **60** begins at a location close to the switch arm **57**, and the cam extends through an arc of around 90° or slightly more.

As shown in FIG. 5, switch **55** is provided with three leads: lead **68** is adapted to receive an input signal; and leads **66** and **67** provide output signals representing the state of the switch.

As a consequence of this construction, when the core is rotated clockwise as the unit is viewed in FIGURE 6, the cam **60** will move beneath the switch **55** to push upwardly on the switch arm **57**, thereby closing the switch contacts. This can complete the circuit to an alarm, which is thereby actuated upon such rotation of the lock. When the other key is turned in the opposite direction, however, in the normal use of the lock, the arm is not moved and the switch remains open.

A simplified circuit illustrating how the alarm is activated in this manner may be seen in FIGURE 7. Alarm **64** is connected via lead **68** to the pole of switch **55**, one contact of switch **55** being connected to output lead **67** to signal one state of the switch, and the other contact being connected to output lead **66** to signal the other state of the switch. An additional lead **67** connects the switch **55** to the source of current. Hence, when the switch **55** is closed, the circuit is completed to the alarm. Other circuitry may be used for the alarm depending upon the requirements of the system with which it is associated.

Another arrangement for tripping the switch in the alarm circuit is shown in FIGURES 8 and 9. In this design there is an opening **69** through the wall of the cylinder **70**, corresponding generally to the opening **51** in the embodiment of FIGURES 5 and 6. However, the opening **69** is longer than the opening **51**, extending substantially the length of the cylinder to the end flange **71**. Near the bottom of the opening **69** is a shoulder **73** through which is a smaller aperture **74** providing communication with the periphery of the core. With the switch **75** mounted in the aperture **69**, the switch arm **76** extends through the opening **74** toward the core. Formed in the surface **77** of the core in alignment with the switch arm **76** is a circumferentially extending groove **78** that extends through a substantial arc.

Normal operation of this lock will be such that the core **72** turns in a counterclockwise direction, as the device is illustrated in FIGURE 9. During this movement the switch arm remains within the groove **78**. However, for the alternate turning with the other key to rotate the core **72** in the clockwise direction, the switch arm **76** is forced upwardly out of the groove **78** to engage the circumferential surface **77** of the core. This trips the switch to complete the circuit to the alarm.

The invention may be adapted for actuation by a latch or bolt mechanism as well as by rotation of the core of the lock as described above. Such an arrangement is illustrated in FIGURES 10 and 11. Here is illustrated a conventional bolt **80** that slides axially with respect to a sleeve **81** that houses it. An arm **82** is connected to the bolt **80** and is used to impart movement to the bolt

when slid longitudinally by means of an associated mechanism, such as the tail piece of a pin-tumbler lock. An opening is formed in the circumferential wall of the sleeve **81** into which is inserted a switch **83**, which is suitably secured in place, such as by adhesive bonding. The actuating arm **84** of the switch is thereby placed adjacent the side wall **85** of the arm **82**. Within the surface **85** there is formed a small depression **86**. This indentation is positioned such that, when the bolt is in the extended or locked position of FIGURES 10 and 11, the switch arm projects into the indentation **86**, and the switch remains open. However, if the bolt is moved inwardly, the arm **82** moves longitudinally to the left. This causes the switch arm **84** to be pushed upwardly along the inclined surface **87** at the end of the indentation **86** so that the switch arm **84** is pressed inwardly toward the switch and held in this position by the side surface **85** of the arm **82**. Consequently, the switch is closed. This will send a signal to the alarm to indicate that the bolt has been opened.

The arrangement of the invention is adaptable also for use with a lazy-cam type mechanism, found for example in some door lock sets. As may be seen in FIGURES 12, 13, 14 and 15, there is a collar **88** rotationally slidable relative to the cylindrical rod **89** of the lock mechanism. It is provided with diametrically opposed slots **90** and **91** into which extend the ends of a pin **92** that passes through the rod **89**. Upon rotation of the rod **89** and its associated pin **92** clockwise 90° from the position shown in FIGURE 13, the collar **88** will be caused to move 90° also by the reaction of the pin against the end of the slot **90**. This brings the mechanism to the position of FIGURE 14. Upon return of the rod **89** to its original position, the collar **88** will remain at the position to which it was turned by the initial clockwise rotation. The unit is then in the position of FIGURE 15. The pin **92** is free to return through a 90° arc by virtue of the opposed slots **90** and **91**. When the mechanism is in the position of FIGURE 15, rotation of the rod **89** counterclockwise 90° will return it to the position of FIGURE 13, again moving the collar **88** back to that location.

A switch **94** is associated with this unit, positioned so that its actuating arm **95** is immediately above the periphery of the collar **88**. An upwardly extending cam element **96** is carried by the collar and aligned with the switch arm **95**.

Consequently, when the mechanism is in the position of FIGURE 13, the cam **96** is remote from the actuating arm **95**. However, upon rotation to the position of FIGURE 14, the cam moves beneath the arm of the switch, thereby tripping the switch to change the position of its contacts. Then, when the rod **89** is returned counterclockwise 90° from the position of FIGURE 14 to that of FIGURE 15, the collar **88** remains in place with the cam **96** beneath the switch **94**. Therefore, the switch arm will remain depressed upon this return movement. The switch arm **95** will be allowed to move away from the switch body only upon a further rotation of 90° of the rod **89**, which brings the mechanism back to the position of FIGURE 13. The switch **94** will be incorporated into an appropriate electrical system to indicate the condition of the lock device as reflected by the position of the lazy cam and the movement of the switch arm.

The selective rotation of the lock may be accomplished through the action of pins and drivers, rather than the stop elements described above, in which event the keys are made different along their working edges rather than being notched. This type of construction is illustrated in FIGURES 16 and 17. Here, the core **98** is provided with a pair of axially spaced circumferentially extending grooves **99** and **100** and its circumferential surface **101**. The groove **99** extends arcuately in one direction with respect to the broached hole **102** for the key, and the groove **100** extends from the opening **102** in the opposite direction. Aligned with the groove **99** is a pin **103** above which is a driver **104** urged downwardly by a compression spring **105**. Similarly, there is a pin **106** aligned with the groove **100**, together with the driver **107** and spring **108**.

In order to rotate the core **98** in the counterclockwise direction, a key **110** is inserted into the opening **102**. The top edge **111** of this key is contoured to move all the pins and drivers upwardly to where their abutting surfaces are at the normal shear line of the lock. This holds true for the pin-and-driver set **106** and **107** as well as the others of the lock. However, the pin and driver **103** and **104** are moved to where their adjacent surfaces are at the bottom wall **112** of the groove **99**. This becomes the shear line for this segment of the lock. The core then can rotate through 90° in the counterclockwise direction until the end surface **113** of the groove **99** is brought against the side of the driver **104**. Rotation in the clockwise direction cannot take place, however, because the end wall **114** of the groove **99** is adjacent the driver and stops such movement.

For movement in the clockwise direction, a different key **115** is inserted in the hole **102**. This key is the same as the key **110** except that its upper edge **116** moves the abutting ends of the pins and drivers to the normal shear line of the lock except for the pin **106** and driver **107**. The latter elements are brought to the bottom wall **117** of the groove **100**. Therefore, rotation clockwise can take place until the end **118** of the groove **100** contacts the driver **107**. Counterclockwise rotation is blocked because the end **119** of the groove **100** is adjacent the driver **107** and will not allow such movement.

With this design, a third key will be provided to raise all the drivers to the normal shear line. This allows removal of the core.

In the design of FIGURES 18, 19 and 20, two keys are utilized, one of which is notched and the other of which is not. By this construction, one key can rotate the lock through a full 360°, while the other can turn it through an arc of less than 360°. This is useful where there is an automatic spring lock that can be neutralized when thet lock is rotated at 360°, but which remains in operation when the lock is turned through a lesser arc. It may be desirable to have some personnel have possession of a key which can never neutralize the automatic lock. Other personnel will be given the key which can rotate the full 360° to neutralize the lock.

In this arrangement, core **120** in the cylinder **121** has an annular groove **122** circumscribing it. A stop pin **123** extends through the cylinder and into the groove **122**. When the unnotched key **124** is inserted into the broached hole **125** (FIGURE 18), it cannot turn a full 360° because its surface **126** will be brought against the stop pin **123** before this can occur.

However, the other key **127** is provided with a notch **128**. This notch is in registry with the groove **122** and pin **123** when the key **127** is fitted into the core. Therefore, the notch will clear the pin **123** and allow the core to be turned the full 360° arc. Consequently, when the key **127** is used, the lock can be neutralized, but not when the key **124** is used.

The arrangement of this invention can be utilized also in connection with a maximum security type lock, in accordance with the arrangement seen in FIGURES 21 through 26. This lock **129** includes a bolt **130** pivotal about a pin **131** that extends between the side plates **132** and **133**. The bolt **130** may be rotated inwardly to a retracted position between the side plates **132** and **133**, or pivoted to project outwardly through the opening **134** and end plate **135** when in the locked position. The pivotal movement of the bolt **130** is effected by a crank **137** pivotal about the axis of an additional cross pin **138**. The pin **138** has a splined exterior that engages the crank **137** so that the pin **138** rotates with the crank **137**. A pin **139** connects the other end of the crank **137** to the bolt **130** in a recessed area **140** by extending through a slot **141** in the bolt.

The crank **137** is rotated by either of the tailpiece elements **143** and **144** which are at the inner faces of cylinders **145** and **146** that are mounted in the side plates **132** and **133**. Typically, one of the cylinders **145** will be actuated by a key, while the other **146** can be manually rotated from the inside through a knob **148**.

The tailpiece elements **143** and **144** include projections **149** and **150**, which are adapted to engage the pins **152** and **153** projecting transversely outwardly from the crank **137**. This engagement results in the rotation of the crank **137** when either member **143** or **144** is turned. In other words, either of the projections **149** and **150** (depending upon which is turned) will engage the pin **153** in rotating the crank **137** counterclockwise, is illustrated in FIGURE 23. This movement will cause clockwise rotation of the bolt **130**, retracting it to the space between the side plates **132** and **133**. The other pin **152** is engaged by the extension **149** or **150** in returning the crank **137** to the position of FIGURE 23. The extensions **149** and **150** also cam the spring-loaded detent **155** out of the end section **156** or **157** of the opposed slots **158** in the side plates **132** and **133** when the bolt is to be moved from one position to the other.

In accordance with the provisions of this invention, a switch **160** is mounted on the side plate **132** immediately adjacent the pin **138** that rotates with the actuating crank **137**. A cam element **161** is formed on the periphery of the pin **138** adjacent the switch arm **162**. Consequently, the cam **161** will depress the switch arm **162** when the bolt is in the closed position of FIGURE 23 and FIGURE 24. On the other hand, when the bolt is open and the actuating crank **137** is moved to its alternate position, the cam leaves the switch arm **162**, allowing it to extend. In this instance, therefore, the rotary movement of a portion of the bolt mechanism is utilized in actuating the switch. Typically, the switch **160** will be normally closed and hooked into an alarm system such as shown in FIGURE 26. Therefore, by opening the bolt **130**, the circuit to the alarm through the conductors **163** and **164** will be closed so that the alarm will become activated. Usually a time delay **165** will be incorporated into such an alarm system so that the alarm **166** is not immediately energized. Thus, an employee authorized to operate the bolt will open the bolt and then disconnect the alarm by opening a second manually operable switch **167**. The time delay will preclude actuation of the alarm until an adequate period has passed for opening the switch **167** to prevent the alarm from becoming activated. On the other hand, when an unauthorized person opens the bolt **130**, he will be unaware of the necessity for deactivating the alarm system. Consequently, after a predetermined period of time the alarm will signal that the bolt has been opened improperly.

It can be seen, therefore, that the basic teachings of this invention can be given many variations in accomplishing results to suit particular needs. The different types of stops, cams, etc., may be arranged in different combinations as desired. Complete selectivity of the operation of the lock can be achieved.

The foregoing detailed description is to be clearly understood as given by way of illustration and example only, the spirit and scope of this invention being limited solely by the appended claims.

What is claimed is:

1. In combination with a pin-tumbler lock having a cylinder and a core rotatable relative to said cylinder, said core having a key-receiving aperture therein, an arrangement for selectively signalling the condition of said lock comprising: a switch in said cylinder, having an actuating arm and a pole and at least one contact; first means operable upon rotation of said core in one direction starting from the initial key insertion position for moving said actuating arm to establish a signal path between said pole and said contact, said first means being also operable upon rotation of said core in a direction opposite to said one direction starting from said initial key insertion positon to release said actuating arm; and second means for defining a selective operation of said lock whereby separate keys may be used to actuate or release said actuating arm and thereby actuate or release said switch, said second means comprising a duality of stop members carried by said cylinder, said stop members being axially spaced with respect to said cylinder, said core having a duality of circumferentially extending grooves in the periphery thereof, the first of said grooves being aligned with the first of said stop members, and the second of said grooves being aligned with the second of said stop members, each stop member extending into the groove aligned therewith, the first of said stop members, being positioned on one side of said key-receiving aperture, and the second of said said stop members being positioned on the opposite side of said key-receiving aperture.

2. In combination with a lock having a cylinder and a core rotatable relative to said cylinder, said core having a key-receiving aperture herein, an arrangement for producing an output signal in response to an input signal, said output signal relating to the direction of turning of the key from a reference insertion position, said arrangement comprising: stop and groove means in said cylinder and said core defining clockwise or counterclockwise freedom of movement for a key from said reference insertion position said key having a notch thereon, the direction of turning of said key from said reference insertion position depending upon the alignment of the notch on the key used as related to said groove, each groove being aligned with a respective stop member; a switching device carried by said cylinder having an actuating arm with a pole and at least one output terminal; and switch actuating means connected to said core such that clockwise rotation of said core from said reference insection position by means of a key with the clockwise permitting notch causes setting of said switching device to a state where current may pass through said pole to said terminal, and counterclockwise rotation of said core by means of a key with the counterclockwise permitting notch causes setting of said switching device to a state where current may not pass through said pole to said terminal.

3. A key actuated selective signalling system for a pin-tumbler lock having a cylinder and a core rotatable therein, said system comprising: a switch having an actuating arm, a pole and a least one contact; means on said lock for applying an input signal to said pole and for deriving an output signal from said switch; selective rotation means in said core restricting rotation of a key with certain notches therein to rotation after insertion in one direction; means providing a direct rotation actuation of said actuating arm for the operation of one key causing clockwise rotation after insertion to cause said output signal to represent said input signal; and means providing a direct rotation release of said actuating arm upon operation of a different key causing counterclockwise rotation, after insertion to terminate said output signal.

4. In a pin-tumbler lock having a cylinder and a core rotatable within said cylinder, the cylinder containing drivers and the core containing pins corresponding to said drivers, respectively, the juncture between said pins and drivers defining a shear line, the improvement for providing selective operable bidirectional signalling comprising: a switch having an arm, a pole and at least one contact; means in said core for adjusting said shear line at one juncture to restrict rotation of said core with the proper key to one direction from the initial insertion position of said key; and for adjusting said shear line at a second juncture to restrict rotation of said core with the proper key to a second direction, opposite to said one direction; a cam; means for causing said cam to rotate against said switch arm and to close said switch to provide a closed circuit between said pole and said contact for rotation of said core in said one direction; and means for

causing said cam to rotate away from said switch arm to release said switch for rotation of said core in said opposite direction to the initial one direction from said insertion position of said key.

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