United States Patent

[11] 3,599,454

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[45] Patented **Aug. 17, 1971**
[73] Assignee **Sargent and Company**
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[54] **KEY READER AND IDENTIFIER SYSTEM**
11 Claims, 25 Drawing Figs.

[52] **U.S. Cl.** **70/265,** 70/277, 70/283, 70/434, 70/460, 340/149
[51] **Int. Cl.** **E05b 47/04,** E05b 47/06, E05b 63/14
[50] **Field of Search** 70/265, 277, 283, 434, 460

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Primary Examiner—Albert G. Craig, Jr.
Attorney—Schellin and Hoffman

ABSTRACT: A strictly mechanical key is used both as an information-carrying medium and as a device for mechanically unlocking a lock in a conventional manner. The information stored on the mechanical key is read at an independent station prior to use in the mechanical lock. The intelligence imparted to the station is of significance in permitting or not permitting the functioning of the lock.

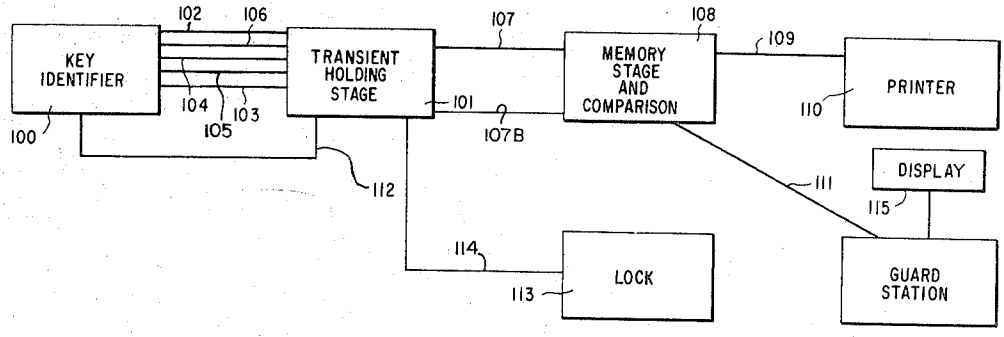

FIG. 2

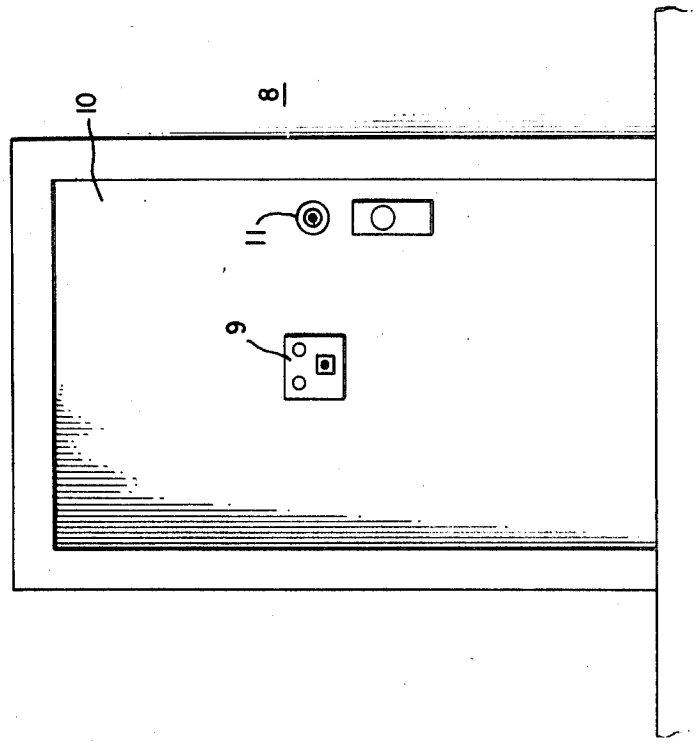

FIG. 1

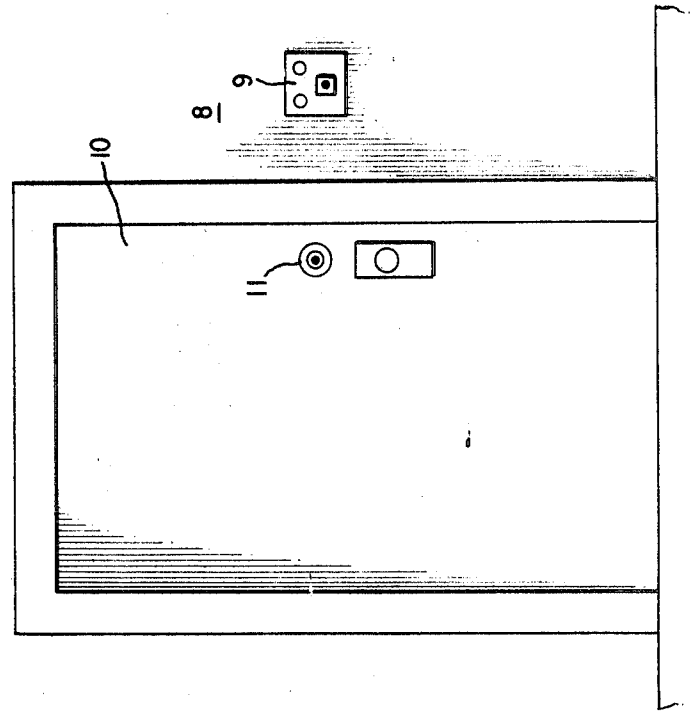

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FIG. 4

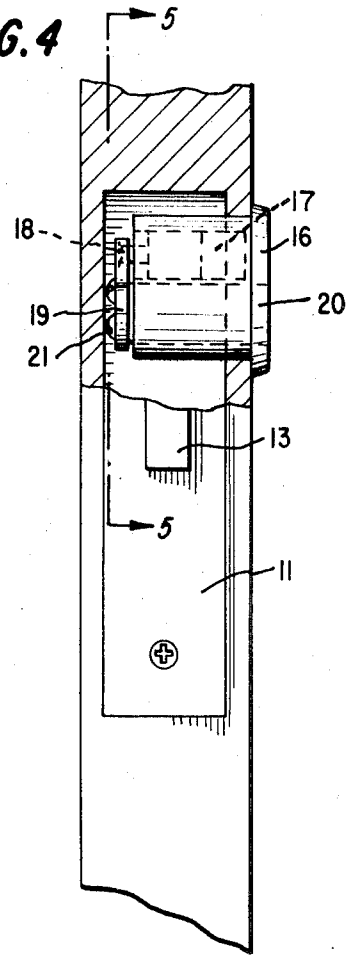


FIG. 3

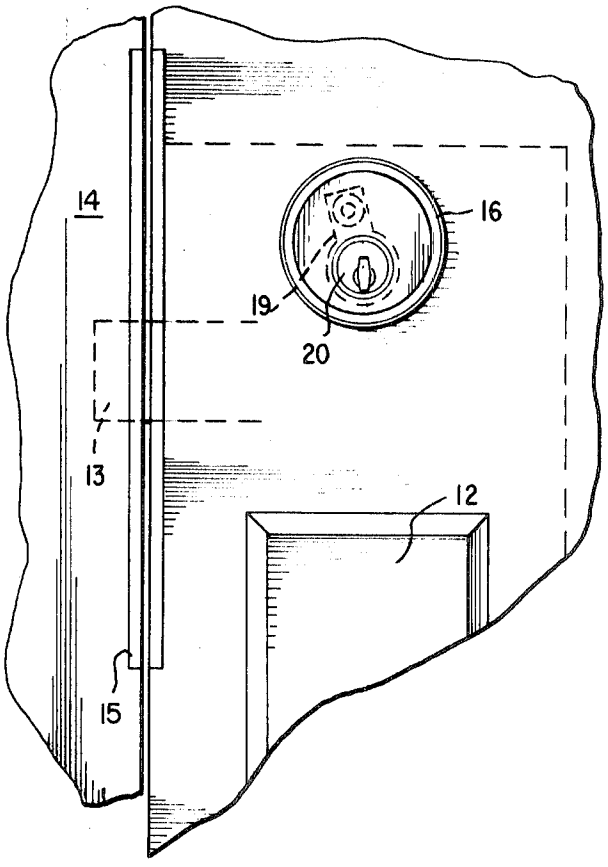


FIG. 5

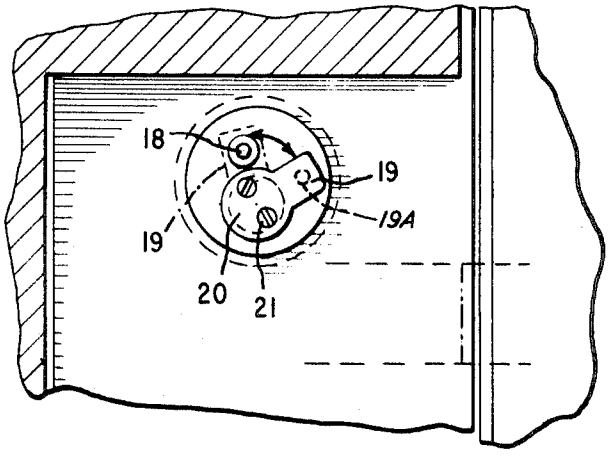
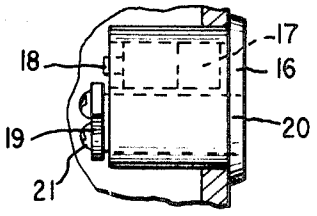


FIG. 6



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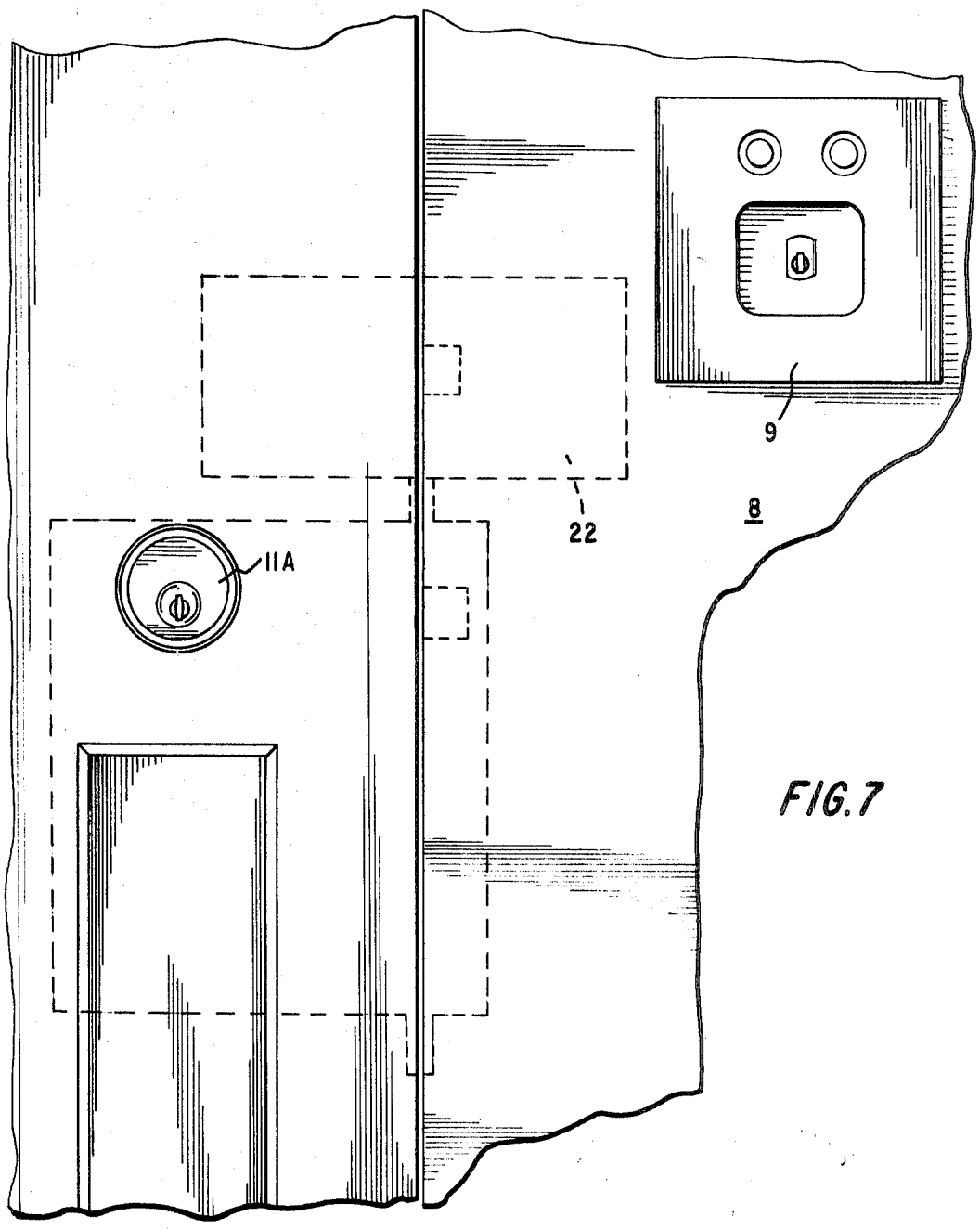

FIG. 7

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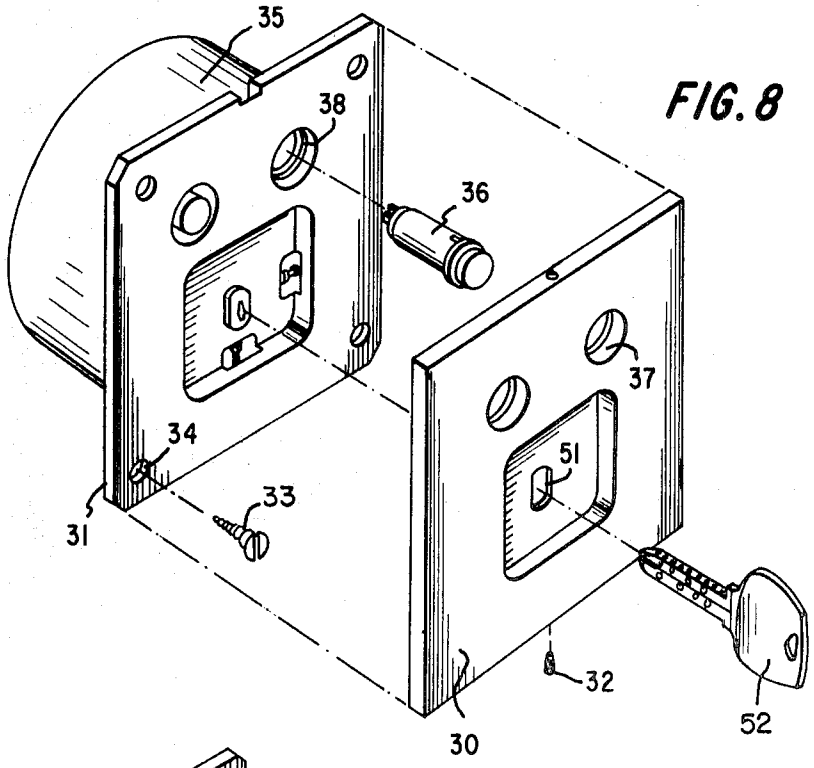

FIG. 8

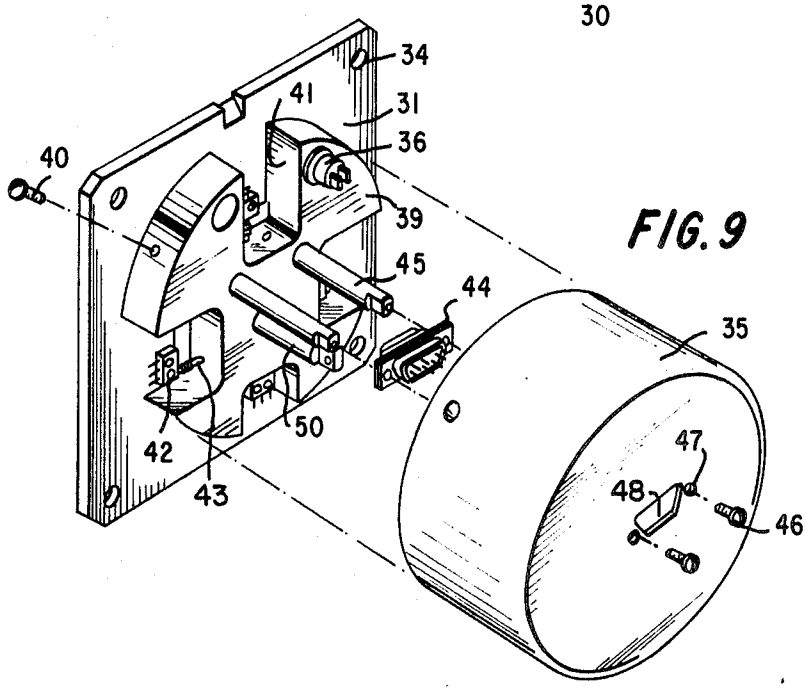

FIG. 9

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FIG. 10

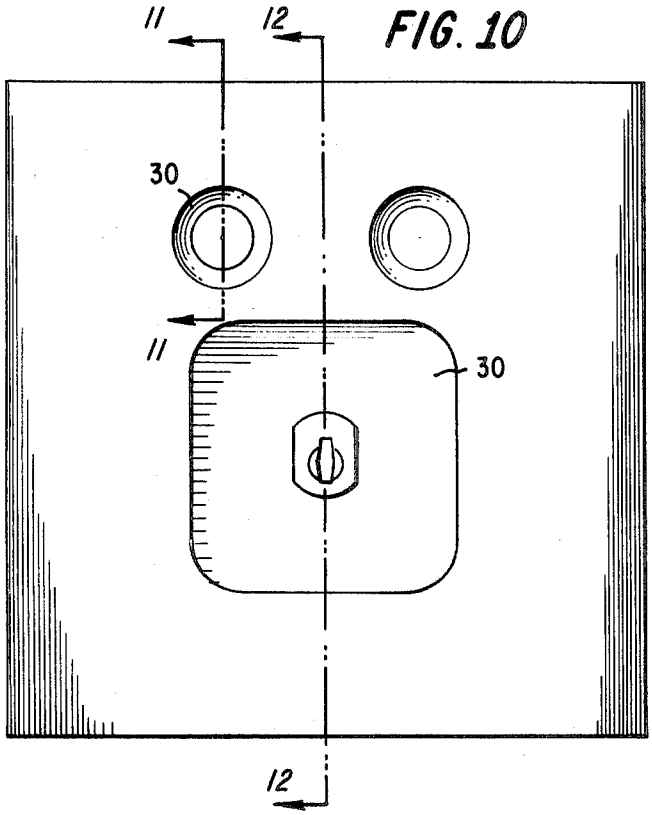


FIG. 11

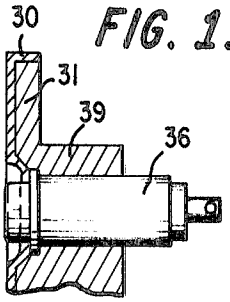


FIG. 13

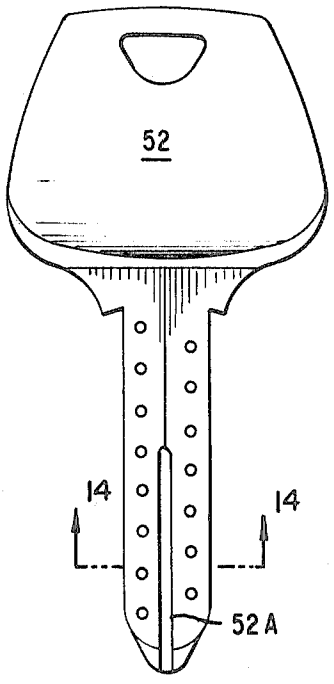


FIG. 12

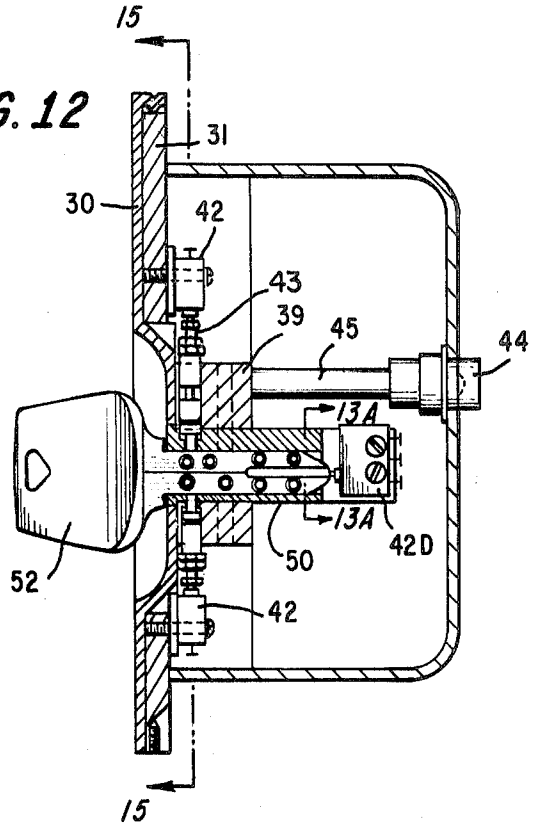
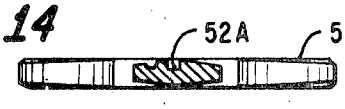


FIG. 14



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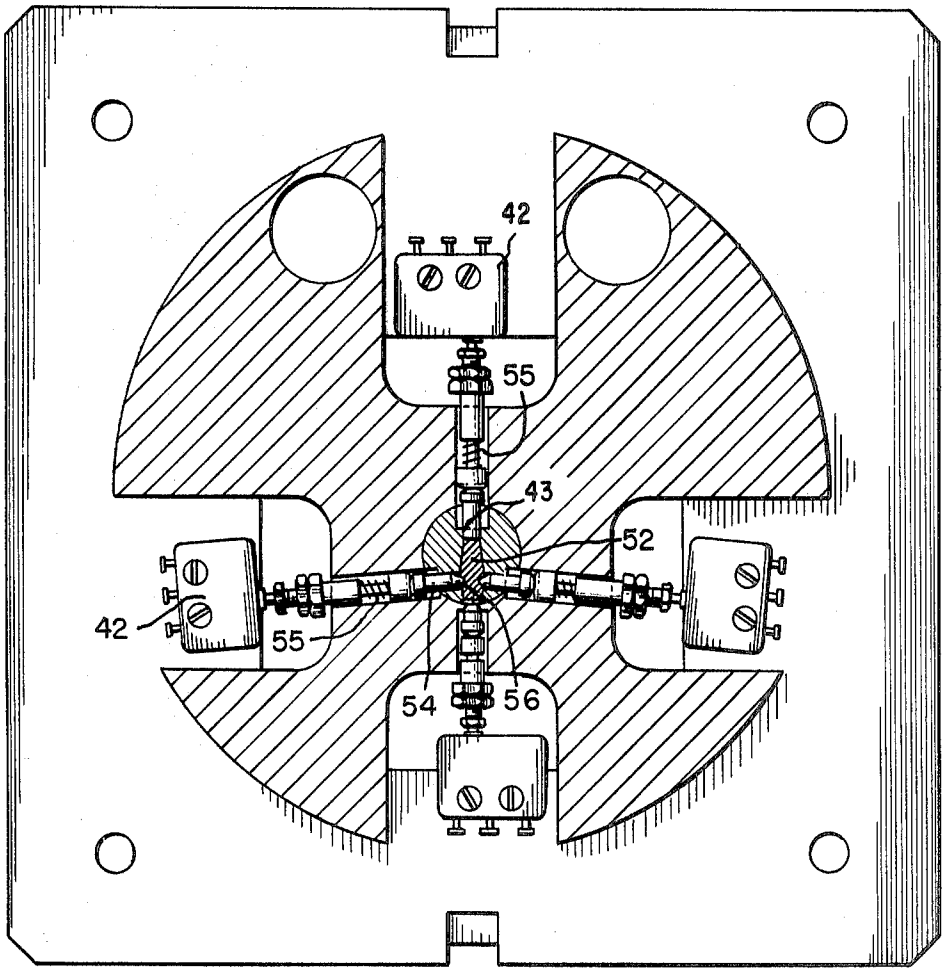
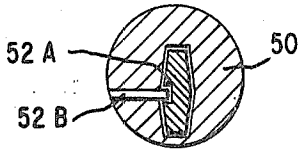


FIG. 15

FIG. 13A



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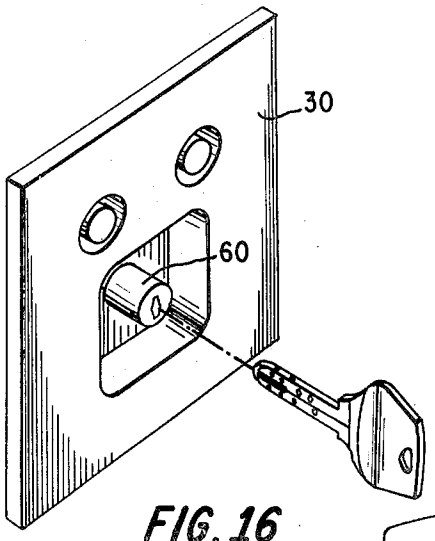


FIG. 16

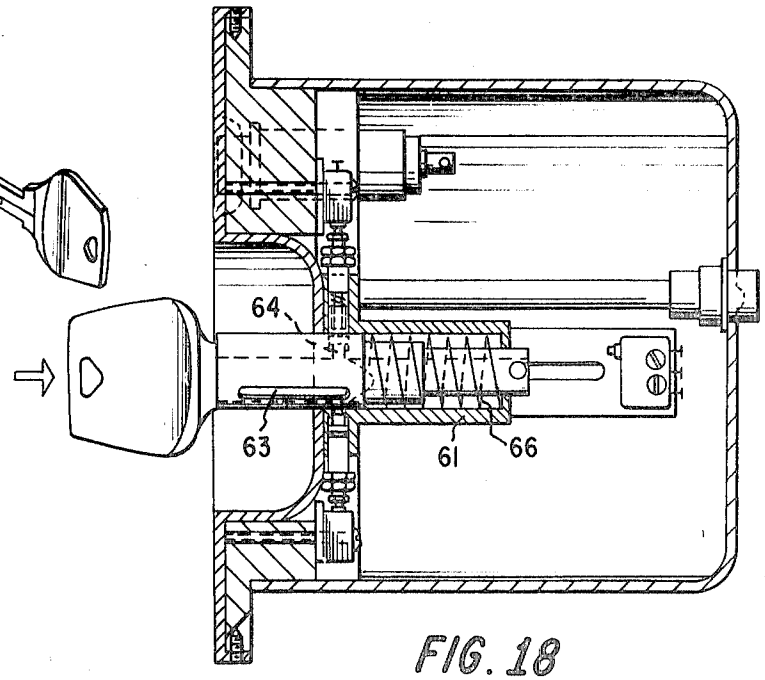
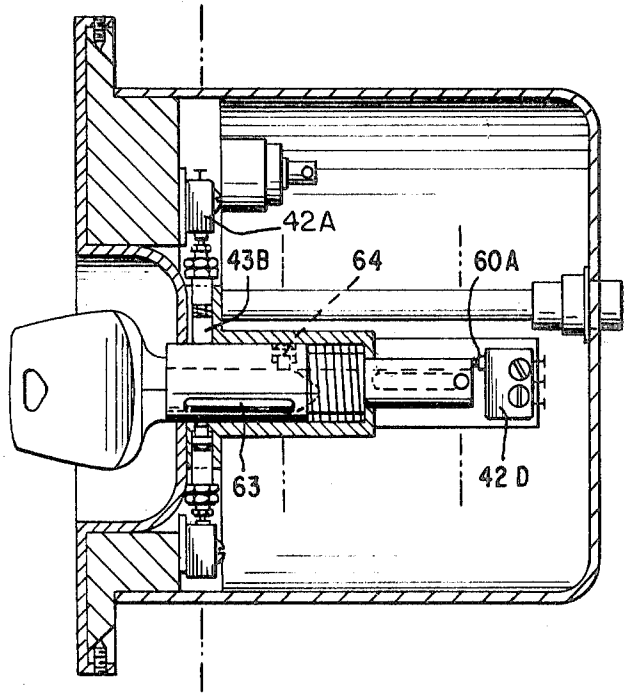


FIG. 18

FIG. 19



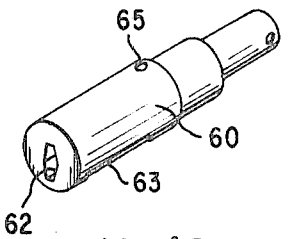


FIG. 17

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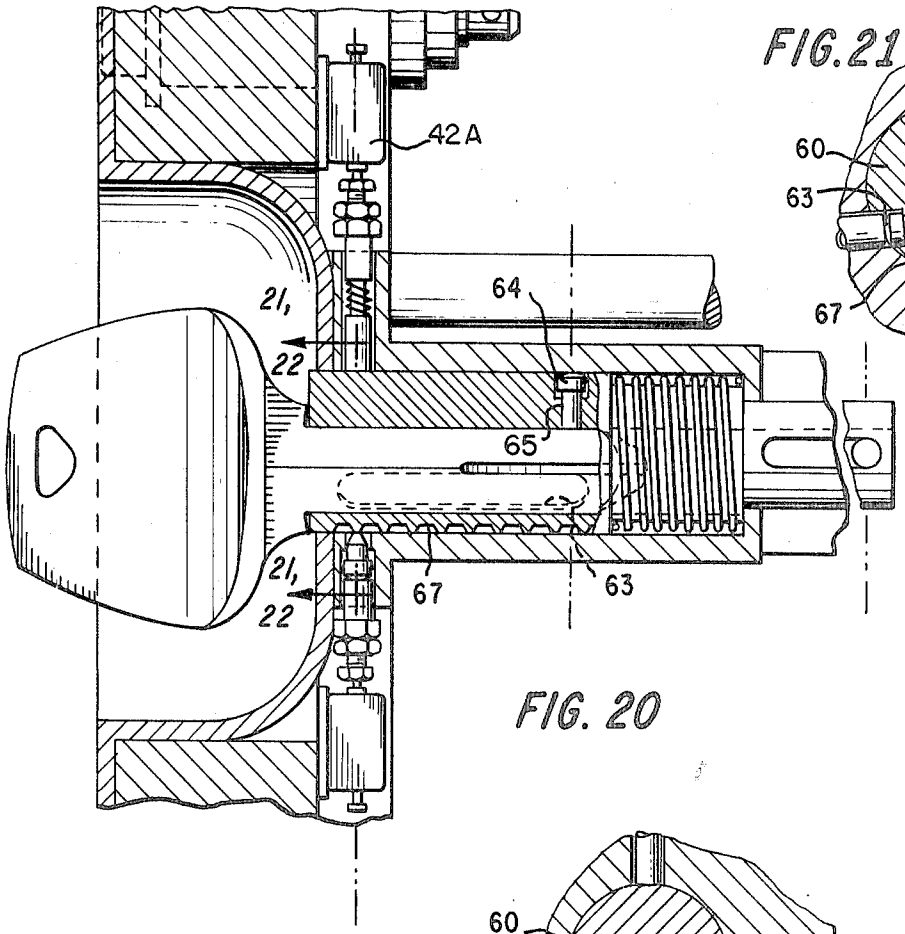

FIG. 20

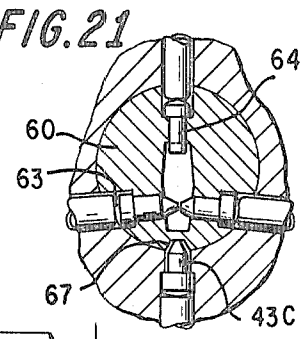

FIG. 21

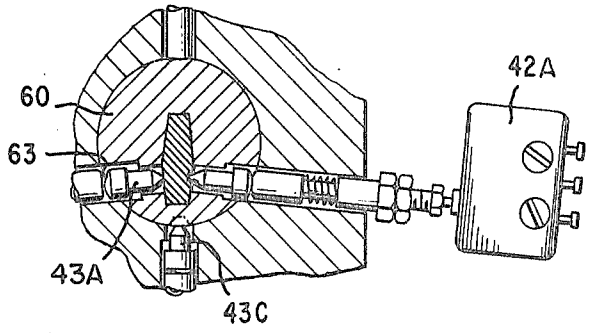

FIG. 22

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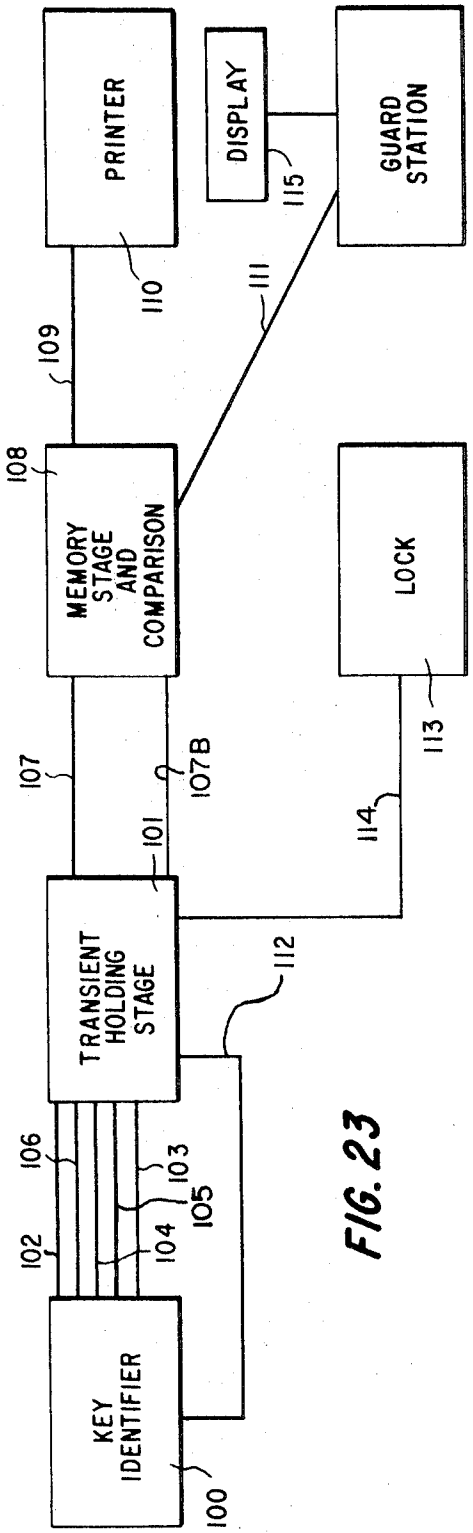

FIG. 23

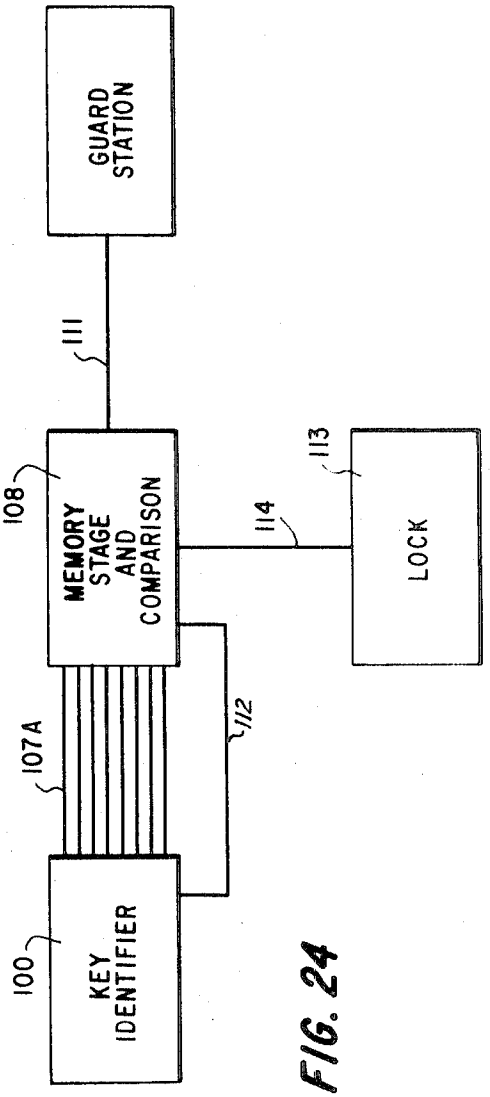

FIG. 24

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KEY READER AND IDENTIFIER SYSTEM

BACKGROUND OF THE INVENTION

It is well known that many government and private installations have proscribed areas, that is, areas to which access is obtained only under certain conditions. In the usual manner, the proscribed area is maintained in a secure fashion by a fence, wall or a complete housing. Ingress is limited to a few specially manned locations. In other words, guards are present at such openings. Individuals having permission to enter the proscribed area are usually given passes of some kind. When the pass is presented to the guard at the manned opening and the guard is satisfied that the individual carrying the pass has a right thereto, the guard will permit access. It will be quickly appreciated that the cost for maintaining a series of openings in an installation can be and is enormous. Further, such costs are multiplied when the installation is operated on a 24-hour basis as is often the case resulting in a plurality of guard shifts.

Without hesitation, those skilled in the art and familiar with problems relative to the responsibility of maintaining and operating proscribed areas will appreciate that reducing the manned force necessary to secure a proscribed area would result in a great financial saving. Prior art workers have made some strides in achieving partial success in suggesting a solution to the problem of manned guard stations. In one aspect a plastic laminated card of the type used in the fabrication of passes has been used. The card, besides having the usual indicia thereon such as photograph and thumbprint, etc., also has additional coded information in the form of, for instance, suitably positioned electric conducting elements of magnetic ink indicia. In this arrangement reading means is employed to "read" the information position on the card. If the intelligence imparted therefrom meets a certain predetermined criteria, a door associated with the means is automatically unlocked thereby permitting the card holder to obtain access to the proscribed area. If the setup includes a door which must also be unlocked by mechanical means, then the card holder must be in possession of two instrumentalities, that is, a key and indicia-carrying card.

ADVANTAGES OF THE PRESENT INVENTION

The present invention seeks to obviate the need of two instrumentalities by combining in one element the feature of carrying definable information and being adapted to mechanically unlock a lock under the aegis of the proper prior-imparted intelligence. Additionally, the system contemplated within the purview of the instant invention includes means to positively identify the specific element employed, means to identify the station at which the element is employed, and means to identify the time when the element is utilized. All of such information is recorded for future review. Additional features and advantages will become apparent from a detailed consideration of the invention as it is presented below.

BRIEF DESCRIPTION OF THE INVENTION

The present invention relates to the use of a key which may operate a tumbler lock of conventional configuration. In addition thereto the system includes electric switching means proximate to the lock mounted on a door or designed to release a door from a latched position. The switching means includes a plurality of switches mounted in a suitable housing. The switches are in an "off" or "on" position in sequence to the cut notches in a key of conventional configuration.

Preferred in the instant invention is a key of the type disclosed in U.S. Pat. No. 3,303,677. It will be seen therefrom that a key is disclosed having spaced drilled cone pits positioned longitudinally on one or more surfaces of a key. By having six sides the key may have the pits along any one or all of the sides. As stated in said patent the pins of a tumbler lock may be located in any one of a plurality of radial directions with the key as the axis of the tumbler.

In the electric switching part of the present invention, the pins which protrude into the pits operate electric switches so that they are in the "off" or "on" position as desired. For purposes of discussion herein, it will be presumed that as the pins of the switches are deployed into the pits of the key the switches are turned "on" so that those pins when deployed in the pits are "on", i.e., in their normal position. Those pins when riding on the land portions of the key are in an "off" position.

The information from the key is fed as the input to a computer which samples the information for storage purposes and for comparison with the already programmed information. When the intelligence received compares favorably with the expected, the computer transmits the information to a mechanically operable lock to permit its operation by the said key which is transferred from the sensing or reading station to the mechanical lock.

The release mechanism in association with the mechanical lock may take the form of a solenoid which removes a stop means normally positioned to prevent a cam from operating, of a type frequently found in a tumbler cylinder lock. The lock may be mounted in the door in the usual manner. Of course, the lock may be mounted on or near the jamb of a door with the bolt keeper in the door itself. In another embodiment the solenoid need not even be directly associated with the mechanical lock but may be operated to retract an independently operated bolt either moving it from an appropriate keeper in the doorjamb or from the door itself so that the lock is again not mounted on the door.

When the electrically operated solenoid is not mounted to directly defeat the mechanical lock, the key, if proper, will always unlock the lock but further progress in opening the door cannot be made until the door is electrically unlatched which is dependent upon the initially imparted information.

Of course, it is within the purview of the instant invention to provide other solenoid-operated release means. For instance, instead of the mentioned stop means, the solenoid could be adapted to remove an obstruction in the keyway, thereby permitting entrance of the key. The obstruction may take the form of a shield to the opening of the keyway or may take the form of means restraining one or more pins in the cylinder lock from operating.

DETAILED DESCRIPTION OF THE INVENTION

The Drawings:

FIG. 1 is a front view of the key identifier and lock as seen upon approach.

FIG. 2 is a front view of another embodiment.

FIG. 3 is a front elevation of a fragmentary portion of a door showing a lock.

FIG. 4 is a side elevation of a fragmentary portion of a door with a portion broken away.

FIG. 5 is a view taken along lines 5–5 of FIG. 4.

FIG. 6 is a further fragmentary view of FIG. 4 with the armature of a solenoid withdrawn.

FIG. 7 is another embodiment of the arrangement shown by FIGS. 3 to 6.

FIG. 8 is a front perspective view of the key identifier with the front plate exploded from the housing.

FIG. 9 is a rear perspective view of the key identifier with the rear housing exploded therefrom.

FIG. 10 is a front view of the key identifier.

FIG. 11 is a cross-sectional view taken along lines 11–11 of FIG. 10.

FIG. 12 is a cross-sectional view of the key identifier taken along lines 12–12 of FIG. 10 with the key fully inserted.

FIG. 13 is a plan view of an embodiment of a key utilizable in the present invention.

FIG. 13A is a cross-sectional view taken along lines 13A–13A of FIG. 12.

FIG. 14 is a cross-sectional view of the key taken along lines 14–14 of FIG. 13.

FIG. 15 is a cross-sectional view of the key identifier taken along lines 15–15 of FIG. 12.

FIG. 16 is a front perspective view of another embodiment of the key identifier of the present invention.

FIG. 17 is a perspective of the key carrier used in this other embodiment.

FIG. 18 is a cross-sectional view of the key identifier of this embodiment at the beginning of operation.

FIG. 19 is also a cross-sectional view with the key in the final state.

FIG. 20 is a partial cross-sectional view of this embodiment of the key identifier.

FIG. 21 is a radial fragmentary cross-sectional view of the embodiment of FIG. 20.

FIG. 22 is a fragmentary cross-sectional view taken along lines 22–22 of FIG. 20.

FIG. 23 is a block diagram of the circuitry involved.

FIG. 24 is a block diagram of the circuitry of another embodiment.

FIGS. 1 and 2 depict the view of a door with a mechanical lock 11 in the door 10 itself. In FIG. 1, to the side of the door, in the wall 8, is the key identifier of the present invention. In FIG. 2 the key identifier is actually mounted in the door as is the mechanical lock 11. In each instance, of course, the lock could be mounted in the doorjamb rather than in the door.

The individual desiring ingress through door 10 must first insert his assigned key into the keyway of key identifier 9. If the key has the proper indicia thereon a light on the key identifier will signal acceptability. At this point the key is removed from the key identifier and is inserted in the lock in the conventional manner and the lock is unlocked. If the individual had directly used his key to unlock the lock without verification by the key identifier, the unlocking step for the door would not have been achieved.

Of course, it will be appreciated that the door to be opened may only be a closure of some sort recognized as a barrier which can be opened for access purposes.

Directing particular attention to FIGS. 3, 4, and 5, a mechanical lock 11 is mounted in a door 10. The top portion of a trim plate 12 is shown in FIG. 3. The lock has a bolt 13 which moves into the adjoining jamb 14 through a strike 15. The cylinder 16 of the lock has been modified in this embodiment to include a solenoid 17 with its armature 18 in a forward position, that is in engagement with a centrally located counterbore 19A in cam 19 to prevent its rotation. The cam 19 is suitably secured to the barrel 20 as by screws 21. The solenoid 17 is suitably connected to electric conductors so that it can be selectively energized whereby the armature is retracted as in FIG. 6 so that the barrel may be rotated when a proper key has been inserted in the lock.

FIG. 5 shows the cam 19 in dotted lines as the angular movement is imparted thereto whereby the bolt 13 is withdrawn from its strike 15.

In FIG. 7 another embodiment of the system is illustrated, where the lock 11A as illustrated does not possess the built in solenoid. Rather a separate electric lock 22 is employed which is electrically operated and is in the unlocked position upon establishment of proper intelligence in the key identifier 9. The electric lock comprises a solenoid which operates through suitable mechanical linkage to withdraw a bolt from a keeper upon electric energization. Suitable resilient means urges the bolt into engaging position, that is, locking condition when the solenoid is deenergized.

On the other hand, it has been found useful to maintain normally armature 18 in the first embodiment and normally the bolt in a retracted position in the second embodiment so that upon a power failure the mechanical lock can still be operated. In certain emergency conditions this will be desirable.

Attention is now directed to FIGS. 8 and 9 for a further understanding of the key identifier 9. In FIG. 8 the front plate 30 of the key identifier has been removed. The front plate 30 is attached to main plate 31 by means of a set screw 32. The key identifier is secured into a recessed position in the wall 8 by a screw 33 for instance, secured through holes 34. Rearwardly extending from the main plate 31 is a cup-shaped enclosure 35. From the enclosure 35 projecting through the main plate 31 and front plate 30 are two signal lamps 36. Suitable openings 37 in the front plate 30 are provided as well as corresponding openings 38 in the main plate 31. One signal lamp exists to indicate that the power is "on" while the second light indicates when an acceptable key has been inserted so that it may be transferred to the mechanically operated lock 11 to unlock the door.

FIG. 9 makes clear the contents of enclosure 35. The enclosure 35 has been exploded from the key identifier. The sensing elements of the key identifier are mounted in block 39 which may be integral with the main plate 31. The enclosure 35 is secured to block 39 by screw 40. The block 39 has four radially extending channels 41. Each of the channels contains at least one electric switch 42. An operative assembly pin means 43 extends from each switch radially into block 39. The switches 42 have suitable wire leads (not shown) to a male jack assembly 44 which is mounted on support rods 45 and is held thereon by screws 46 which also pass through openings 47 in the enclosure 35. Access to the male jack assembly 44 is through an aperture 48 in the enclosure 35.

From FIG. 8 it will be seen that a key accepting cylinder 50 is in a forward facing position and is mounted substantially axially with respect to block 39. A portion of the cylinder 50 projects through opening 51 of the front plate 30. The key 52 of the six-sided pitted type is positioned for insertion into the cylinder 50. The cylinder 50 also extends rearwardly from block 39.

FIG. 10 is a front view of the plate 30 and constitutes a reference for the cross-sectional views of FIG. 11 and FIG. 12. In regard thereto, FIG. 11 is a fragmentary view of the signal lamp 36 with front plate 30 in place on main plate 31 with block 39 rearward of that. The signal lamp 36 has suitable terminal leads 53 also directed to the male jack assembly 44.

For an understanding of the mechanical features attendant the operation of switches 42, attention is directed to FIG. 15. The switches 42 are operated by assembly pin means 43 which include pins 54 which are urged outwardly from the switch 42 by helical spring 55 towards the key 52. Whenever the ends of the pins 54, which are adapted to fit into the pits 56 of the key 52, actually move into the pits 56 the switch 42 will operate to either close or open depending upon the manner in which the information is to be fed to the computer.

In one embodiment, in operation, the lower most switch 42 acts as the start switch. This results when the key is first inserted which forces the pin 54 to operate lower switch 42. The actual operation is best initiated by having the identifier go into operation when the pin 54 of the lowermost switch 42 enters the first pit. The other side and top switches 42 then have pins which move into other pits on the longitudinal confronting surfaces of the key 52. With the first pit position, as stated, the computer is turned on, ready to receive other information and a sync type signal is sent to the computer instructing the computer to "read" the status of the side switches and the uppermost switch. For instance, if there are pits at the side surfaces or top surface of the key then the pins of the respective switches will dwell therein giving an "on" signal to the computer. As the key is given further insertion the next pit along the lowermost surface thereof will again supply a sync signal and again the other stated switches are read. A key 52 will usually have a plurality of pits along its underside, the key will be read on a plurality of occasions. The first pit may be used as both a turn-on means for the computer as well as a means for supplying a sync signal. While the intelligence provided in increments may be digested by the computer in this manner, it is preferred to collate this intelligence transiently which is then fed to the memory bank of the computer for comparison. The intelligence transfer is achieved upon complete insertion of the key, as in FIG. 12, whereupon the leading portion of the key 52 impinges on switch 42D which is suitably wired to the computer through male jack assembly 44. While the description in the above gives the impression that the key is slowly inserted, this is not the case. The key may be moved in a single rapid motion.

In the event that the intelligence obtained from the key 52 compares favorably with the information expected, the proper lamp 36 will signal acceptability. At the same time lock 11 will be released for mechanical actuation as in the embodiment of FIG. 4 or electric lock 22 will be unlocked as in the embodiment of FIG. 7. In any event a delay system permits the transfer from the key identifier to the mechanical lock for unlocking purposes leading to ingress through the now unlocked door 10. The delay period is, of course, necessary to permit removal from the key identifier to the mechanical lock without the occurrence of a return to normal solenoid-caused block.

By employing the configuration of the key 52, the surfaces of the lower half of the key are employed for the key identifier. The surfaces of the upper half are coded with pits to operate the mechanical lock. However, in the above it will have been noted that the uppermost surface may also have been read. As a matter of fact, all the surfaces of the key 52 may be read by the key identifier with the provision of switches to confront all surfaces. Also, the mechanical lock need not be dependent upon the pits of only the upper half of the key. It will be evident that a combination of varying types may be accomplished and utilized without departing from the scope of the invention.

As far as the information parameters are concerned, the more information encoded on the key 52 the more difficult will it be to gain entrance with a trial and error facsimile.

In the embodiment of the invention discussed, the intelligence imparted is forwarded in increments. In this manner the number of switches are kept to a minimum, that is, the maximum would be to include one reading switch for each surface. Even the final switch 42D would be eliminated as intelligence transfer to the memory bank could be accomplished upon the conclusion of, say, 10 reading steps. The present invention also contemplates the use of a plurality of switches along one or more surfaces of the keyway whereby the key is inserted and the position of each of the switches is read for simultaneous readout. In this type of embodiment a great number of switches must be included with a concomitant greater space requirements and expense in manufacture. When an unsophisticated computer is employed, a key identifier of this type may be more advantageously employed.

FIG. 13 and FIG. 14 depict key 52 in enlarged detail. The surfaces thereof are seen to be appropriately pitted. A ward 52A is included so that the key can be accepted in only one position thereby avoiding a spurious signal if the key were inverted and the pits were not identically positioned along both longitudinal halves of the key.

FIG. 13A being a cross-sectional view shows radial pin 52B in cylinder 50. The end of the ping 52B rides in ward 52A.

Again turning to FIG. 15 which is a forwardly directed view of the switches 42 in reading position on a key 52 which is shown in cross section. In this view it will be seen that the pin 43 of uppermost switch 42 terminates in a flat manner so that it cannot project into any of the pits that may be present along the uppermost surface of the key 52. In this instance, the uppermost switch is merely used as an "on" switch as long as the key is present. The two side switches are the only two engaged in sensing the presence or absence of pits for purposes of sensing the encoded information.

FIGS. 16 through 22 relate to another embodiment of the key identifier arrangement of the present invention. In this embodiment the key 52 is inserted in a carrier 60 which is mounted in the cylinder 61. A major portion of carrier 60 projects forwardly from the front plate 30 (as seen in FIGS. 16 and 18). The carrier as seen from FIG. 17 has a centrally located keyway 62. It has two oppositely disposed longitudinal slots 63 thereby providing access through the carrier 60 to the keyway 62. The slots 63 provide access for the pins 43A of side switches 42A so that the pits along the lower sides of the key 52 may be sensed for their presence or absence thereof. Upper start switch 42A is operated through alignable pin 64 located in radially located opening 65 of the carrier 60. The insertion of the key 52 along the keyway of the carrier raises pin 64 so that pin 43B is pushed upward through its appropriate channel whereby the switch is turned on. The pin 64 is of a size so that its upper surface does not project beyond the carrier, whereby the carrier can move unobstructed rearwardly as seen from FIG. 19.

The carrier is urged outwardly by helical spring 66 which abuts one of its ends against an end portion of the cylinder 61 and the other end against a shoulder of the carrier. When the key is inserted and pushed the carrier moves toward the switch 42D to signal a readout as seen from FIG. 19 where the end portion 60A of the carrier moves to turn switch 42D in an "on" position.

The sync signal from the lowermost switch need not obtain the signal directly from the key 52. Therefore, no slot 63 is provided. Rather the bottom of the carrier itself is longitudinally pitted along the periphery of the carrier 60 as can be more clearly discerned from FIGS. 20, 21 and 22. A series of pits 67 are located along the underside of the carrier 60.

In FIG. 21 the side pins 43A project into the keyway 62 of the carrier 60. Pin 64 projects downwardly, while pin 43C of the lowermost switch projects upwardly into the initial pit 67 of the carrier 60. In FIG. 22 a key has been inserted so that the pins 43A of the side switches can read the absence or presence of the pits in the key.

In essence the operation of the arrangement of this embodiment is similar to the previously discussed embodiment except a carrier is interposed in the reading setup. It will be apparent if more surfaces of the key are to be read then more switches will have to be provided along with additional slots to provide access to the key.

In the foregoing the key 52 has been of the type disclosed in U.S. Pat. No. 3,303,677. However, other types of keys could be used with conventional pin tumbler cylinder locks. Of course, the number of surfaces that could be read would be circumscribed. A combination key could also be employed where the uppermost and lowermost surfaces would have the well-known notch configuration while the sides would be fitted for encoded information.

Having an understanding of the mechanics of the present invention attention is now directed to FIG. 23. The key identifier station 100 has a number of leads to a transient holding stage 101. Lead 102 is the "on" signal obtained upon initial insertion of the key. Prior to each readout a sync signal is transmitted over lead 103 while the readout signals are transferred by leads 104 and 105, more would be required when more than two readout switches are used. When the readout has been completed the transfer signal passes through lead 106. The transfer lead 107 carries the total intelligence to a memory stage of a computer 108 for review by the stage to determine if the key has met certain predetermined characteristics. The key has been encoded for not only acceptability but for number classification so that the computer can determine to whom the key has been assigned. The results of the identification and comparison is transferred through lead 109 to a printout device 110 for a permanent record including information as to key identifier station source, owner of key, time of use and acceptability or nonacceptability. A signal is transferred through lead 111 to a central guard station who can monitor a plurality of key-identifier stations associated with ingress doors. The computer stage 108 will send a signal through lead line 107B to transient holding stage 101 which in turn transmits a signal to the key identifier lamp 36 through lead 112 and to the electric lock arrangement 113 through lead 114.

A nonacceptable key will alert the guard by means of a display 115. The guard may take action such as by closed circuit television monitoring of the key identifier station giving rise to the nonacceptable key.

The system of the present invention is particularly versatile as new keys may be issued on a periodic basis with a change in the information expected by the computer. The mechanical lock need not be changed, since in most cases the surface of the key having the operating indicia for the mechanical lock

may remain the same. Of course by changing the tumblers in the mechanical lock the keys may be changed in their mechanical operability.

When the key identifier is of the embodiment (mentioned in the above) which employs a plurality of switches positioned longitudinally, there is no need for a transient holding stage. FIG. **24** exemplifies the circuitry involved in a simplified version of the system. For instance, it will be seen that a plurality of leadlines **107A** connects directly from the key identifier to the computer stage **108**. As all of the information passed from the key identifier to the computer is accomplished en masse after the key has been completely inserted, there is no need for the transient holding stage.

In this embodiment, the printer and display units are not included. Additionally, the guard station may be eliminated for an even more simple version.

One of the inherent features attendant the system described in the above is the fact that the mechanical lock becomes virtually pickproof. It may be possible for a keyless individual, desiring entrance, to somehow fool the key identifier to produce a "go" signal to the mechanical portion of the system. At this point the keyless individual would have to rapidly pick the mechanical lock. Since the built-in "delay" would give less than the minimum time necessary to pick a mechanical lock the keyless individual would not have sufficient time before the mechanical section is rendered inoperative again.

In another embodiment of the invention, the closure portion comprises what is termed a barrier section. The barrier section consists of a first closure and a second closure. The first closure may be a revolving door which is released upon receipt of a proper signal from the key identifier. After passing through the first closure the individual desiring entrance is presented with the second closure which is locked with a mechanical lock and may be unlocked with the same key as used in the key identifier.

While there have been shown and described particular embodiments of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and, therefore, it is aimed to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim is:

1. A key identifier system and unlocking arrangement for a closure comprising a key, mechanical lock adapted to be operated by said key, linkage means for physically sensing information present on said key in the form of preselected varying dimensional configurations, electric supply means, electric switch means for converting said information into a plurality of electric pulses, computer means for comparing said plurality of electric pulses with plurality of recorded pulses previously supplied to said computer means, electric responsive means associated with said lock and normally conditioned to prevent unlocking of said closure by operation of said mechanical lock with means of said key lead means for supplying signal from said computer means to said electric responsive means upon proper comparison of said pulses for conditioning said electric responsive means to permit unlocking of said closure.

2. The system of claim **1** wherein the electric responsive means comprises an electromagnet having armature means adapted to prevent operation of said mechanical lock.

3. The system of claim **1** wherein the electric responsive means comprises an electromagnet having means adapted to release said closure whereby to permit the opening of said closure with operation of said mechanical lock by means of said key.

4. The system of claim **1** wherein the key has a plurality of longitudinal surfaces and said varying dimensional configuration are pits in spaced relationship along at least one of said longitudinal surfaces.

5. The system of claim **4** wherein the electric switch means includes a plurality of switch means mounted radially with respect to said key when said key is moved into position for physically sensing information, and said linkage means includes pins adapted to ride on said longitudinal surfaces and into said pits and thereby turn said switch means into an on or off position as said key is moved.

6. The system of claim **5** wherein said linkage means includes a key carrier means interposed between said switch means and that portion of the key having said longitudinal surfaces, said carrier means adapted to be moved past said switch means, said carrier having apertures to permit access of said pins to at least one of the longitudinal surfaces of said key.

7. The system of claim **6** wherein the key carrier means has information present thereon in the form of preselected varying dimensional configurations.

8. The system of claim **1** wherein the series of electric pulses are supplied sequentially.

9. The system of claim **1** wherein the series of electric pulses are supplied as a group.

10. The system of claim **1** wherein delay means is included for maintaining and limiting the duration of said electric responsive means in a positive position thereby obtaining limited but sufficient time to operate said mechanical lock by means of said key.

11. The system of claim **1** wherein printout means is cooperatively associated with said computer means whereby a permanent record of said information on said key is obtained.