

Nov. 3, 1970

T. R. NANCE

3,538,501

ELECTRONIC LOCK HAVING SWITCH CONTROLLED AND GATES

Filed June 13, 1968

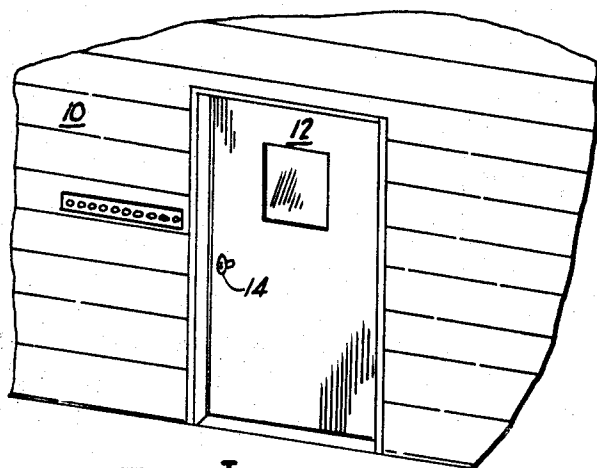


FIG. 1.

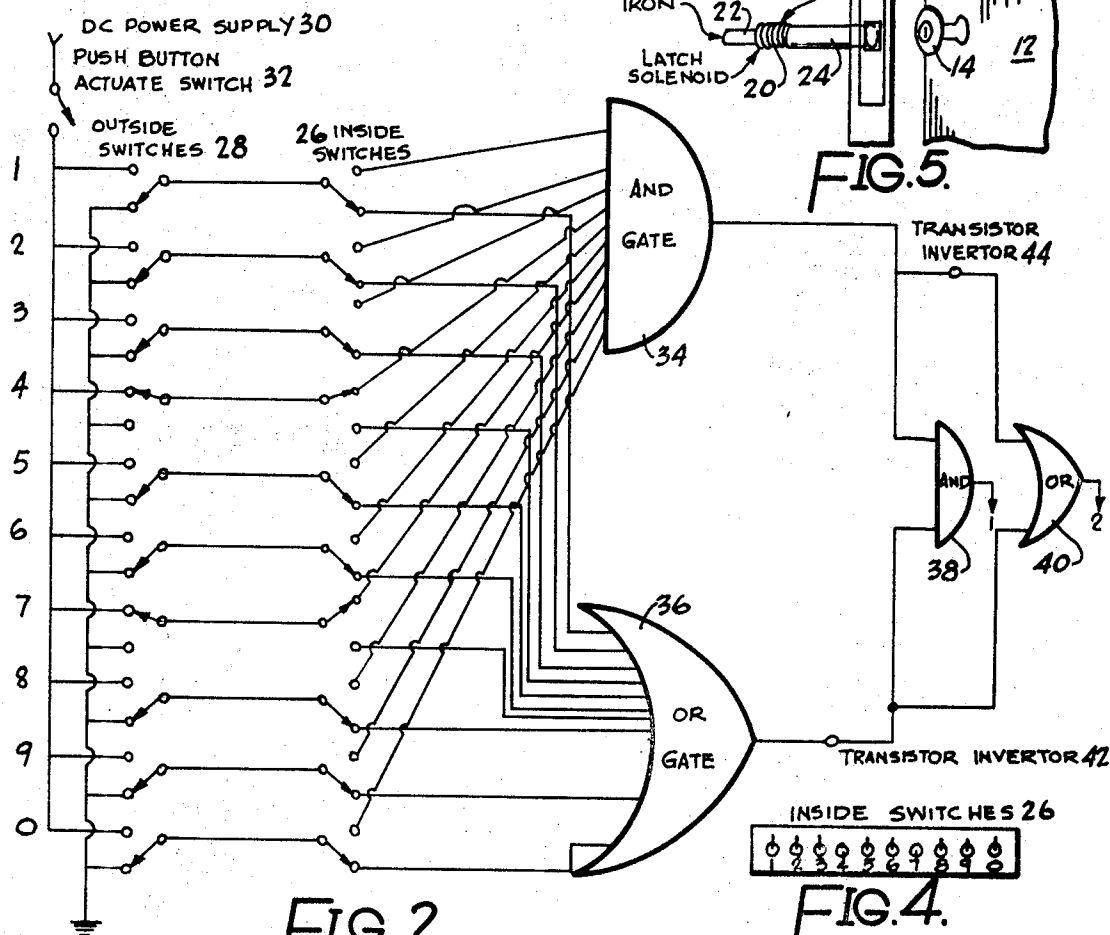


FIG. 2.



FIG. 3.

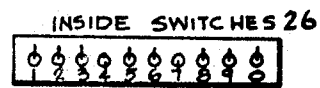


FIG. 4.

INVENTOR.
THOMAS R. NANCE

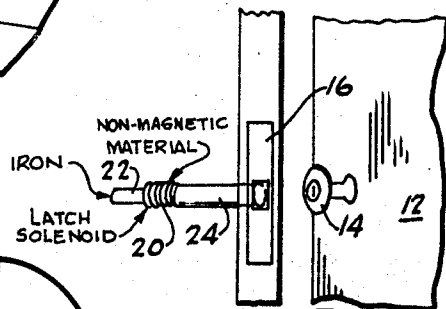


FIG. 5.

1

3,538,501

ELECTRONIC LOCK HAVING SWITCH CONTROLLED AND GATES

Thomas R. Nance, 3003 Avenida Codorniz,
Santa Fe, N. Mex. 87501

Filed June 13, 1968, Ser. No. 736,843

Int. Cl. H04q 3/02

U.S. Cl. 340-164

5 Claims

ABSTRACT OF THE DISCLOSURE

An electronic system for locking and unlocking locks utilizing a first set of manually set switches to determine a code or combination and a second set of switches which must be set in accordance with the code before the lock is unlocked. The system functions automatically but the code can be selected or changed quickly and easily as desired.

SUMMARY OF THE INVENTION

A first plurality of manually controllable two position switches at a first location, as for example inside a house, are individually placed in either position as desired to determine the code.

A second and like plurality of like switches are disposed at a second location for example secured to the outside of the house adjacent a door having a lock controlled by my system.

The switches are suitably connected in circuit with a power supply and one or more electronic gates with means such as a solenoid control on the door lock to unlock the door only when the second or outside switches are set to the proper code. The lock can also be unlocked in conventional manner by a key if desired.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a fragmentary view of a building using my system;

FIG. 2 is a block diagram of my system;

FIG. 3 is a view of the outside switches;

FIG. 4 is a view of the inside switches; and

FIG. 5 shows a detail view of the lock.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to FIGS. 1-5, a house 10 has a door 12 with a conventional key operated lock in door knob 14. Associated with the door is a latch plate 16 with a hole in which a plunger 24 can be inserted flush or removed. A latch solenoid 20 has an iron armature 22 operating non magnetic bar 24. When the solenoid is energized, armature 22 pushes bar or plunger flush with the hole allowing the door to be opened.

This type of installation allows the door to be operated conventionally without need for running wires inside the door.

A first plurality of manually operable two position switches 26, in this example ten switches are disposed within the house and can be individually preset to one or the other position to define or select the code.

A second and like plurality of switches 28 is disposed on an outside wall of the house adjacent the door. Each

2

of switches 26 and 28 is associated with a different one of digits zero through nine as shown. Each switch 28 associated with a selected digit is connected in series with the corresponding switch 26 associated with the same digit.

A power supply 30 is connected through a push button actuate switch 32 to each of the series connected switches as well as to the gates described below.

The outputs of all switches 26 are connected in parallel to the input of an exclusive "and" gate 34 and to the input of an exclusive "or" gate 36.

The output of gate 36 is fed to one input of "and" gate 38 as well as to one input of an "or" gate 40 through an inverter 42. The output of gate 34 is fed to another input of gate 38 as well as through inverter 44 to another input of gate 40. The output of gate 38 appears at 1 while the output of gate 40 appears at 2.

The 1 output can be used to operate the lock and appears only when the switches 28 are each set in like manner to the corresponding switches 26. Gate 34 produces a binary one only when the switches are so set and produces a binary zero if one or more switches are improperly set.

Gate 36 produces a binary zero when all switches are properly set and a binary one if one or more switches are improperly set. Gate 38 produces the 1 output only when the correct condition is indicated by a binary one from gate 34 and a binary one from inverter 42 which is only produced by a binary zero at gate 36.

The 2 output can be used to energize a relay and actuate an alarm. The 2 output is only produced by gate 40 when it receives a binary one from inverter 44 (i.e. a binary zero from gate 34) or a binary zero from inverter 42 (i.e. a binary one from gate 36).

While I have described my invention with particular reference to the drawings, such is not to be considered as limiting its actual scope.

Having thus described this invention, what is asserted as new is:

1. An electronic system for energizing and deenergizing a solenoid for unlocking and locking a lock, said system comprising

a first plurality of two position switches disposed at a first location, the positions of said switches being manually adjustable to set a code;

a second and like plurality of like switches disposed at a second location accessible by a user, each second station switch being connected in series with a corresponding first station switch;

a power supply connected to all second station switches; an exclusive "and" gate coupled to said supply and connected at its input to all first station switches, said gate producing a first signal only when the user places the second station switches in the same positions as the corresponding coded first station switches;

and means coupled to the output of the "and" gate to actuate the solenoid and unblock the lock only when the first signal is produced.

2. A system as set forth in claim 1 further including an exclusive "or" gate coupled to said supply and connected at its input to all of said first station switches, said "or" gate producing a second signal when one or more of the second station switches are improperly set, whereby said second signal can be used to sound an alarm.

3. A system as set forth in claim 1 adapted for use in a building having an outside door with said lock, said first plurality of switches being located inside the building, said second plurality of switches being disposed at a location accessible from outside of the building.

4. A system as set forth in claim 1 further including a switch for turning the system on or off as desired.

5. A system as set forth in claim 1 wherein the solenoid controls a plunger which can be moved in and out of a latching hole of a conventional key operated lock.

10

References Cited

UNITED STATES PATENTS

2,095,688 10/1937 Ballentine ----- 340—164

HAROLD I. PITTS, Primary Examiner

U.S. Cl. X.R.

340—147, 149