Nov. 28, 1967 C. L. GREEN 3,354,677

DOOR CONTROL SYSTEM

Filed June 1, 1965

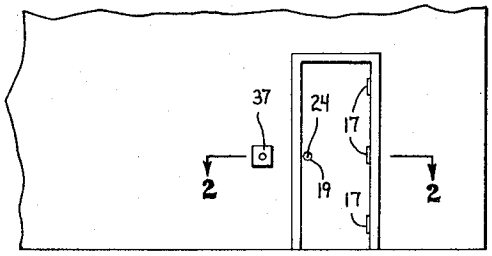


Fig. 1.

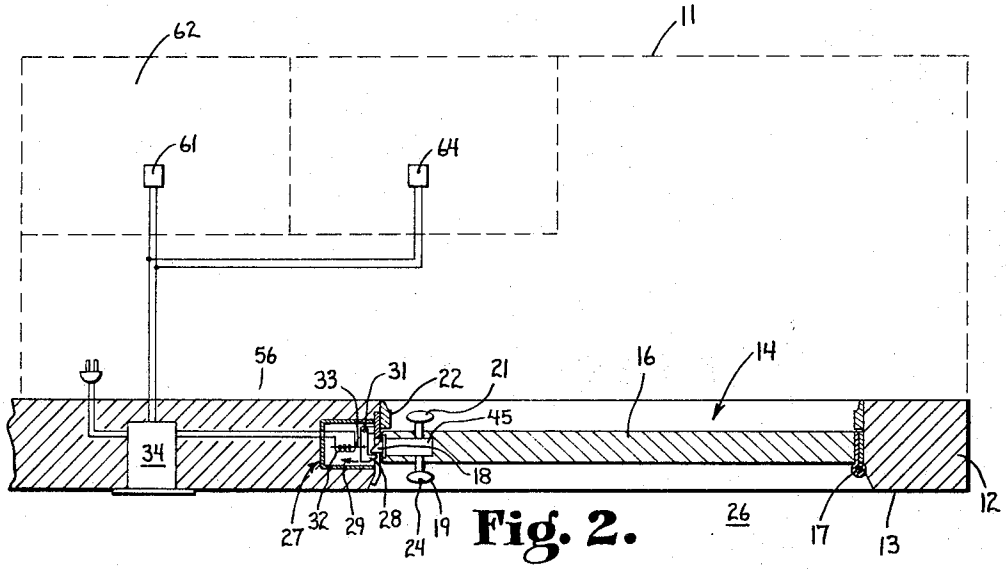


Fig. 2.

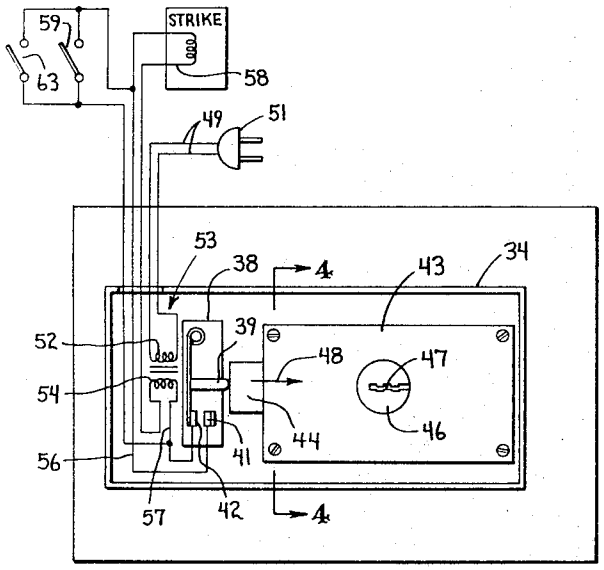


Fig. 3.

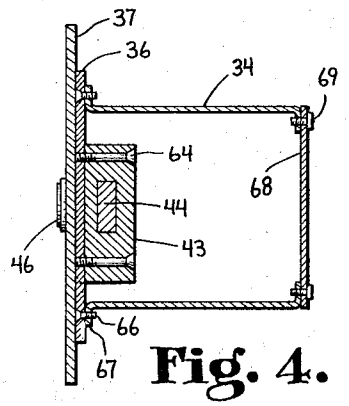


Fig. 4.

INVENTOR.
CLARK L. GREEN

BY
Lockwood, Woodard, Smith & Weikart
Attorneys

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DOOR CONTROL SYSTEM

Clark L. Green, 3156 N. Bancroft, Indianapolis, Ind. 46218

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ABSTRACT OF THE DISCLOSURE

A key-enabled, knob-operated door latch cooperating with a solenoid-operated strike operable by building occupants from remote locations in the building. A separate, wall-mounted lock assembly with keyway accessible to mailman outside building and operable by his key but not the door latch key. A normally-open switch closable by key operation of the separate lock to operate the strike for access to the building by the mailman.

Background of the invention

This invention relates generally to traffic control of entrance doors to apartments, banks, offices, factories, and institutions. It relates more particularly to means whereby an authorized individual or class of individuals is able to gain access to the interior of a building by the use of a lock different from the lock used by others for normal access to the interior of the building.

In certain buildings, such as apartment buildings, it is desirable to enable the entrance of certain individuals. For example, it is desirable to enable the mailman of the United States Post Office to enter the building for mail deliveries, and yet exclude all other persons, except occupants of the building and those whom the occupants wish to admit, when made aware of their presence at the entrance door. One possible way to do this would be to provide the mailman with a key to the lock on the entrance door. However certain policies, regulations, or other considerations, prevent the mailman from accepting a key to the usual door lock. Another possibility would be to employ an electrically operated door strike so that when the mailman arrives at the building, and makes his presence at the entrance door known to an occupant inside the building, the occupant can operate the door strike to release the door and allow the mailman to enter. A hazard present in this type of arrangement is that an occupant will be deluded by an imposter, who then gains access to the building.

It is therefore a general object of the present invention to provide means whereby authorized individuals or classes of individuals can gain access to the interior of locked buildings, without the necessity of identification by occupants thereof, and without being required to use the conventional entrance door lock.

A further object is to provide a means whereby a separate lock of conventional construction but owned and operable exclusively by an authorized organization or its employees or agents, enables entry.

Described briefly, in a typical embodiment of the present invention, an entrance door to an apartment building is provided with a front door knob with a key operated lock therein whereby the door can be opened by persons possessing the key therefor. An electrically operated door lock strike is also employed so that occupants of individual apartments in the building can, by remote control, operate the strike and release the latch to allow entrance by individuals whom they know and recognize. According to the present invention, the strike is also operable by a key operated lock mounted in the building wall near the door. This lock can be operated by a key from outside the building, but cannot be operated in any other manner.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

FIG. 1 is a front elevational view showing a building entrance incorporating the present invention.

FIG. 2 is a much enlarged sectional view therethrough taken along the line 2—2 in FIG. 1 and viewed in the direction of the arrows.

FIG. 3 is a still further enlargement of the lock control box as seen from the rear, including a cover plate.

FIG. 4 is a section therethrough taken along the line 4—4 in FIG. 3 and viewed in the direction of the arrows.

Referring to the drawings in detail, the building designated generally by the dotted outline 11 has an outside wall 12, the outer surface 13 of which may be of any suitable building material such as bricks, blocks, or wood or metal siding material. A door opening is provided in the wall at 14 and has a door 16 swingably mounted in the opening by means of the hinges 17 mounted to the door jamb. At the swinging edge of the door is a latch 18 operable by the outside knob 19 when the door is unlocked and by the inside knob 21 at any time, such latch operating knob assemblies being well known and of conventional construction. A door stop 22 is provided to permit swinging of the door outwardly only, although the present invention can be practiced with doors which are capable of swinging either or both ways. The knob 19 has a key way 24 therein, the slot for which opens outwardly to the outdoor space 26 in front of the building and outside the wall 12.

An electrically operated latch strike assembly 27 is provided, and this may be of conventional construction. The strike 28 is normally in the position shown, but may be pulled in the direction of the arrow 29 about the pivot 31 by energization of the solenoid winding 32, the armature 33 being connected to the strike. By so doing, the strike 28 is moved out of the position where it can prevent the door from being opened outwardly, whereupon the door may be opened without retracting the latch 18. This, too, is a conventional type of construction. However, according to the present invention a box 34 is mounted in the wall and has a mounting plate 36 thereon and a face plate 37 thereon, the face plate having an outer face of an attractive material properly blending with the exterior decor. Inside this box is a normally open switch 38 having an operating plunger 39, and having a pair of contactors 41 and 42 therein. Although the switch unit itself, which may be of conventional construction such as furnished by the Micro Switch Company, has the contact 42 biased in a direction tending to close it with contact 41, a lock assembly 43 is also provided in the box according to this invention and has a deadbolt 44 therein holding the plunger 39 in a position keeping the contactors 41 and 42 separated.

Although the lock 43 may be of conventional construction, and have a cylinder 46 therein with a key-way and key-slot 47 facing outwardly in the same direction as the slot 24 in the door knob, a feature of the present invention is the fact that the key which is used and which will operate the lock 43 is different from the key for the door knob lock and will not operate that lock. Likewise the key which will operate the door knob lock 45 will not operate the lock 43. The appropriate key, when inserted in lock 43 will serve to rotate the cylinder 46 and move the deadbolt in the direction of the arrow 48 to allow the switch contactors 41 and 42 to close.

Referring further to FIG. 3, the electrical input to the door control system may be applied to the box 34 through

the input lines 49 which may be connected to a 110 volt supply, for example. Although a plug 51 for this purpose is shown, the connection may be directly through a fuse box or otherwise. This supply input energizes the primary coil 52 of the transformer 53, which steps down the voltage to the secondary coil 54 to a level which is typically employed in electric door strikes. One lead 56 from the secondary winding is connected directly to one end of the lock strike solenoid winding, whereas the other lead 57 from the secondary winding 54 may be connected through one of three sets of switch contacts, in the illustrated embodiment. The first set of contacts has already been mentioned, they being contactors 41 and 42 which, when closed, supply current through the lead 58 to the other end of the lock strike solenoid. Another switch 59 is shown in parallel with contactors 41 and 42 and may be located in a box number 61 in a room 62 of the building remote from the front door. By closing this switch 59, the strike is energized to release the door. Another switch 63 may be located in a block 64 in another room of the building, and may be manually operated or could be operated by a telephone control or some other means. Switch 59 is push button operated.

The construction of the present invention makes it possible for the post office department, for example, to furnish the lock 43, which would be owned by the post office and the keys to which would be retained exclusively in the possession of the post office. Thus the postman could gain access to the building interior by employing his key for operating the deadbolt to close the switch contacts 41 and 42 and release the strike. Naturally for this purpose the distance between the key slot 47 and the door should be within convenient reach of an average adult.

Normally the box 34 with the mounting face 36 thereon and face plate 37 affixed thereto would be secured to the wall by cementing the face plate to the exterior surface of the wall. In this manner there is no way to gain access to the lock or switch arrangement without destroying the face plate. Positive assurance is thereby provided that unnoticed tampering cannot take place.

If for any reason the unit must be removed, the face plate can be destroyed to remove the box from the wall and the post office lock can be removed therefrom by simply releasing the screws 64 and dismounting the lock from the mounting plate 36. The box 34 may be secured to the mounting plate by means of screws 66 in the ears 67 and a rear cover 68 can also be mounted to the box by screws 69, although a one-piece box can be employed, if desired.

It will be recognized that it is not essential that the knob have a key-slot therein, so long as the latch is somehow operable by the keys or key which the normal occupants or occupant of the building have in their possession. A key operated latch, even without a knob could be employed, if the door did swing inwardly, rather than outwardly. The key could then be turned and the door pushed inwardly. Again, an important feature is that the key used for the latch operation be different from that used for the operation of lock 43, and that the key useful in the one lock is not useful in the other lock. It should be recognized, of course, that other means for operating the lock or releasing the strike or latch could be employed such as combination locks.

While the invention has been disclosed and described in some detail in the drawings and foregoing description, they are to be considered as illustrative and not restrictive in character, as other modifications may readily suggest themselves to persons skilled in this art and within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. In a building structure, the combination comprising:

a building wall having a first opening therein;

a door hingedly mounted in said opening and swingable between an open position and a closed position closing said opening;

a stop on said wall, said stop permitting said door to swing in one direction only from its closed position;

a knob operated latch at the swinging edge of said door;

an electrically operable strike in said wall at the edge of said opening, said latch being normally received in said strike and engaged thereby, preventing said door from opening;

a first key operated lock connected between said latch and said knob and having a key-slot therein and operable when locked to prevent unlatching of said door by said knob, said first lock being operable to an unlocked condition by a first key to enable unlatching of said door by operation of said knob;

solenoid means in said strike and operable, when energized, to disengage said latch and release said door to swing open;

a receptacle in said wall;

a second key operated lock in said receptacle and having a key-slot therein facing outwardly from said wall in the same direction as the key-slot in said first lock;

a deadbolt in said second lock;

a source of electrical energy;

a first normally-open electrical switch in a circuit with said source and said solenoid means, said switch being normally held open by said deadbolt, said second lock being operable to unlocked condition by a second key inoperative in said first lock, said second lock, when operated to an unlocked condition moving said deadbolt to a second position enabling closure of said first switch, said first switch thereupon closing to make said circuit and energize said solenoid means to release said door to swing open;

a second normally-open switch connected in parallel with said first switch, said second switch having operating means inside the building structure, and said key-slots opening on the outside of said building,

said first key being inoperative in said second lock,

and said second lock being secured in said building wall and operable only by a key inserted in the key-slot thereof and only from outside the building.

2. In a building structure, the combination comprising:

a building wall having a first opening therein;

a door mounted in said opening and swingable between an open position and a closed position closing said opening;

a latch at the swinging edge of said door;

an electrically operable strike in said wall at the edge of said opening, said latch being normally received in said strike and engaged thereby, preventing said door from opening;

a first key operated lock connected to said latch and having a key-slot and key-way therein and operable when locked to prevent unlatching of said door by said knob, said first lock being operable to an unlocked condition by a first key to operate said latch and enable opening of said door;

solenoid means in said strike and operable, when energized, to disengage said latch and release said door to swing open;

a receptacle in said wall;

a second key operated lock in said receptacle and having a key-way and key-slot therein facing outwardly from said wall in the same direction as the key-slot in said first lock;

a deadbolt in said second lock;

a source of electrical energy;

a first normally-open electrical switch in a circuit with said source and said solenoid means, said switch being normally held open by said deadbolt, said second lock being operable to unlocked condition by a second key inoperative in said first lock, said second

lock, when operated to an unlocked condition moving said deadbolt to a second position enabling closure of said first switch, said first switch thereupon closing to make said circuit and energize said solenoid means to release said door to swing open;

a second normally-open switch connected in parallel with said first switch, said second switch having operating means inside the building structure, and said key-slots opening on the outside of said building,

said first key being inoperative in said second lock,

and said second lock being secured in said building wall and operable only by a key inserted in the key-slot thereof and only from outside the building.

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BOBBY R. GAY, *Primary Examiner.*