(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 736 623 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.12.2006 Bulletin 2006/52

(21) Application number: **06100397.6**

(22) Date of filing: **16.01.2006**

(51) Int Cl.:
E05B 53/00 *(2006.01)* ***E05B 63/14*** *(2006.01)*
E05B 63/24 *(2006.01)* ***E05B 17/04*** *(2006.01)*

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **09.05.2005 IT RM20050222**

(71) Applicant: **Lardieri, Raffaele**
09013 Carbonia CA (IT)

(72) Inventor: **Lardieri, Raffaele**
09013 Carbonia CA (IT)

(74) Representative: **Leone, Mario et al**
Società Italiana Brevetti S.p.A.
Piazza di Pietra 39
00186 Roma (IT)

(54) Door safety system

(57) A safety system applicable to doors or the like, comprising at least one first box-type element (1a, 1b) placed in correspondence of a door (100); at least one blocking element (2a, 2b) housed in the box-type element (1a, 1b); and means for activating the safety system; wherein the blocking element (2a, 2b) is movable between an opening position (A) in which it is not engaged to the door (100) and a closing position (B) in which it is engaged to the door (100); and the activating means is apt to bring said at least one blocking element (2a, 2b) reciprocatingly in an opening position (A) and in a closing position (B) by means of an actuating element (3) and of elements (40) for connecting the actuating element (3) to the blocking element (2a, 2b).

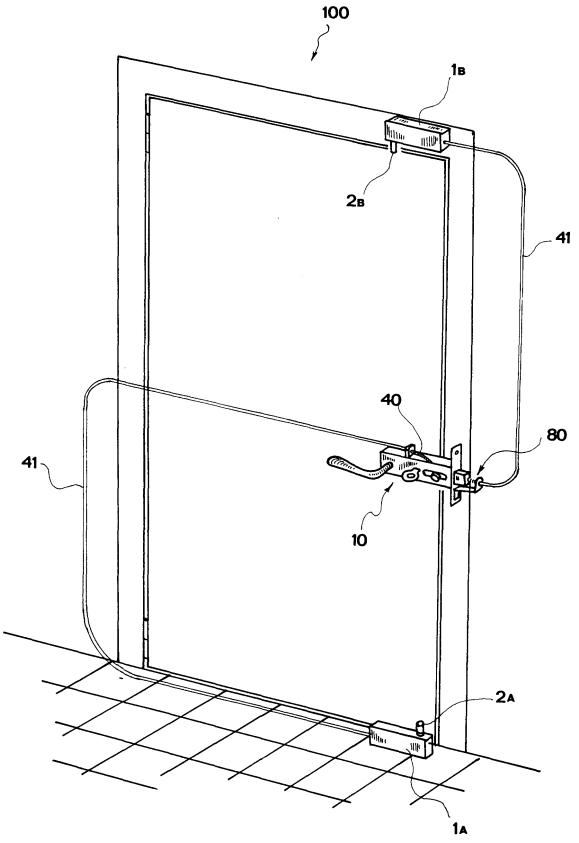

FIG.1

EP 1 736 623 A2

Description

[0001] The present invention refers to a safety system for fixtures in general, and specifically to an anti-burglary safety device for doors and the like.

[0002] Such a structure finds application in the field of the manufacturing of safety casings and anti-burglary devices.

[0003] In the state of the art, armour-plating systems for doors and the like are such as to be not easily applicable to pre-existing structures.

[0004] Accordingly, often replacing the entire fixture is more convenient than armouring it.

[0005] To reinforce a door, the accepted practice comprises internally armouring the door, fitting out at least the leaves thereof with metal sheet cores, providing the subframe with anti-unhinging clamps to attain a sturdy wall-anchoring, as well as utilizing locks with a varying degree of intricacy.

[0006] Incorporating said armour-plating systems into the body of an original door is quite complex; even in case of success, they entail a remarkable load increase (burdening) on the bearing masonry.

[0007] Such a load increase damages the stability of the masonry, ultimately possibly compromising the holding safety of the fixture.

[0008] The known art is not aware of a safety system of simple contrivance applicable, with an easy installation procedure, to a pre-existing fixture, and in particular to a door, so as to provide an effective and inexpensive barrier against lock-picking, forcing and intrusions with burglary in general.

[0009] Hence, object of the present invention is to solve said problems by proposing a safety system applicable to doors or the like as defined in claim 1.

[0010] The safety system applicable to doors or the like according to the present invention constitutes a powerful anti-burglary system.

[0011] The safety system according to the present invention is of easy installation and comfortable use, with no need to carry out complicated operation sequences.

[0012] Thanks to its versatility, the safety system according to the present invention may advantageously and inexpensively be adapted to any typology and configuration of fixture or door, entailing no important modifications to be carried out on the original structure of the fixture or door for its installation.

[0013] The safety system according to the present invention does not hinder the normal operation of the door and can be selectively activated by a user.

[0014] The safety system according to the present invention can advantageously cooperate with a pre-existing lock of a door, or it may be made totally independent therefrom.

[0015] Advantageously, the adoption of a safety system according to the present invention allows to exploit at best any configuration of the masonry in which the fixture is enclosed.

[0016] A safety system according to the present invention is sturdy, void of intricate mechanisms and it can easily be inspected.

[0017] Thus, the ordinary or extraordinary maintenance thereof is made easier.

[0018] Further advantages, as well as the features and the operation modes of the present invention will be evident from the following detailed description of two embodiments thereof, as well as of some variants thereof, given by way of example and not for limitative purposes, making reference to the figures of the annexed drawings, wherein:

- figure 1 is a perspective view of a first embodiment of the safety system according to the present invention, applied to a door;
- figure 2 is a perspective view illustrating the cooperation of the safety system of figure 1 with the lock of the door to which it is applied;
- figure 3 is a partially sectional perspective view of a detail of the safety system of figure 1, in correspondence of the lock of the door to which it is applied;
- figure 4 is a perspective view of a detail of figure 2 in which it is highlighted a connection mode between the safety system of figure 1 and the lock of the door to which it is applied;
- figure 5 is a perspective view of a second embodiment of the safety system according to the present invention, applied to a door;
- figure 6 is a perspective view of a mechanism for actuating the safety system of figure 5;
- figure 7 is a partially sectional view illustrating a first element for blocking the safety system according to the present invention, movable between two end configurations, respectively:
  - in solid line, an opening position in which it is not engaged to the door to which the safety system is applied; and
  - in dotted line, a shutting position in which it is engaged to said door;
- figure 8 is a partially sectional view illustrating, with modes analogous to the preceding figure, a second element for blocking the safety system according to the present invention;
- figure 9 is an exploded perspective view depicting the structure of the blocking element of figure 7 and of a respective seat in which it is movable between said shutting and opening positions; and
- figures 10 and 11 are perspective views apt to illustrate an assembling mode of the safety system according to the present invention, in which a removable cover plate makes the installation of the safety system basically invisible.

[0019] To describe the present invention, hereinafter reference will be made to the above-indicated figures.

[0020] A safety system according to the present invention, applicable to doors or fixtures in general, comprises at least one box-type element 1a, 1b placed in correspondence of a door 100, or of a fixture in general, and at least one respective blocking element 2a, 2b apt to be housed into the box-type element 1a, 1b.

[0021] A first and a second embodiment of the present invention, depicted in figure 1 and in figure 5, respectively, provide the presence of a first blocking element 2a and a second blocking element 2b, each housed in a respective box-type element 1a, 1b.

[0022] Each blocking element 2a, 2b is movable between an opening position A in which it is not engaged to the door 100 and a shutting position B in which it is engaged to the door 100.

[0023] In particular, each blocking element 2a, 2b is shifted, until assuming said two end configurations, thanks to means for activating the safety system.

[0024] Said means for activating the safety system comprises an actuating element 3 incorporated in an actuating mechanism 10; 20; and elements 40 for connecting the actuating system 3 to each respective blocking element 2a, 2b.

[0025] The configuration is such that the actuating element 3, by shifting, causes the activation of the safety system via the connecting elements 40, reciprocatingly bringing each blocking element 2a, 2b in the opening position A and the shutting position B.

[0026] In the case at issue, with regard to the embodiments disclosed in figure 1 and in figure 5, the blocking elements 2a, 2b are bolts 2a, 2b and the connecting elements are cables 40.

[0027] The bolts 2a, 2b are partially extractable from seats 5 obtained into the respective box-type element 1a, 1b housing them, and are apt to partially engage to the door 100 when assuming the shutting position B.

[0028] In both depictions given by way of example in figure 1 and in figure 5, it is envisaged the joint operation of a bottom bolt 2a and a top bolt 2b.

[0029] The bottom bolt 2a is housed in a box-type element 1a, preferably enclosed in the floor in correspondence of the doorsill, or anyhow mounted integral with a stationary anchoring portion.

[0030] The top bolt 2b is housed in a box-type element 1b, preferably walled in correspondence of the door lintel, or anyhow mounted integrally to a stationary anchoring portion, even externally to the wall.

[0031] The seats 5 obtained into the box-type elements 1a, 1b, respectively, are substantially tubular, and comprise guides 7 apt to allow the sliding into their hollow of the respective blocking elements 2a, 2b housed therein.

[0032] According to the variant embodiment disclosed in figure 7 and in figure 8, the guides may be obtained with longitudinal guide slits 7 allowing the translation of the blocking elements 2a, 2b.

[0033] The latter are dragged by the respective cables 40 thanks to fastening elements 8 integral with each respective blocking element 2a, 2b.

[0034] Such fastening elements, e.g. rings 8 as illustrated in figures 7 and 8, are apt to slide along the longitudinal guide slits 7, so as to allow the translation of the blocking elements 2a, 2b.

The structure of the box-type elements 1a, 1b results, e.g., from the assembling of an open main body 50 with a cover 60 therefor.

Preferably, the cover 60 incorporates the seat 5 for the respective blocking element 2a, 2b.

[0035] As it can be seen in figures 7, 8 and 9, the seat 5 comprises a stiffening section 61 projecting from the plane of the cover 60 outward so as to strengthen the overall structure of the box-type element and follow the stroke of the blocking element 2a, 2b externally to the box-type element.

[0036] Thanks to this constructive solution, the box-type element 1a, 1b may effectively be buried in the masonry flush with the stiffening section 61 projecting from the cover 60.

[0037] Thus, a firm anchoring is attained.

[0038] In particular, as it is apparent in figures 10 and 11, the box-type element 1a, 1b may be enclosed at a depth such that the stiffening section 61 be flush with the external surface of the enclosing masonry.

[0039] In this case, a plate 62, preferably having a thickness basically equal to the projection of the stiffening section 61 from the box-type element 1a, 1b, may be removably applied on the respective cover 60 of the box-type element 1a, 1b.

[0040] The plate 62 is provided with a hole apt to house the stiffening section 61.

[0041] Thus, it is restored the continuity of the masonry surface in which the box-type element 1a, 1b is enclosed.

[0042] By suitably shaping and colouring the plate 62, optionally made of the same material lining the floor and ceiling in the case of the box-type element 1a, 1b, respectively, the installation of the safety system according to the present invention is made basically invisible, even when the door 100 is in the open configuration.

[0043] The plate 62 may be designed so as to be advantageously removable, thereby allowing an easy access to the inside of the box-type elements 1a, 1b, that can be opened, e.g., by unscrewing the cover 60.

[0044] Such an option of facilitated access is particularly useful, e.g., to prepare a ready maintenance.

[0045] A plurality of grommets 9 apt to foster the guided sliding of the cables 40 may be incorporated to the cover 60, or to a wall of the main body 50.

[0046] The cables 40 are in charge of driving stresses to the blocking elements 2a, 2b so that the shifting of the latter is carried out.

[0047] For the driving of said forces to occur in the most effective way, the cables 40 are preferably inserted into basically semi-rigid guide sheaths 41.

[0048] Said guide sheaths 41 are connected to box-type elements 1a, 1b via disassemblable connecting means 42, e.g. screwed to nuts welded on the box-type elements.

[0049] Analogously, said guide sheaths 41 are connected to the actuating mechanism 10; 20 via disassemblable connecting means 43, 44.

[0050] The mechanism for actuating the safety system according to the present invention may be placed near the door 100 and the actuating element 3 can be selectively activated by a user, e.g. by inserting a key 70 or by an electronic command emitted by a remote unit and addressed to a control unit of the actuating mechanism.

[0051] For both of the embodiments of figures 1 and 5, the actuating element 3 concomitantly produces opposite stresses onto the connecting elements 40, so that they concomitantly bring in a shutting position B or in an opening position A the blocking elements 2a, 2b.

[0052] With regard to the first embodiment of the safety system according to the present invention, generally depicted in figure 1, the actuating mechanism is a lock 10 of the door 100 and the actuating element is a bolt 3 of the lock 10.

[0053] A cable portion 40a connects the bottom bolt 2a to the bolt 3.

[0054] Said cable portion 40a is inserted into a guide sheath 41, a first end thereof being, e.g., connected by screwing to a nut welded to the box-type element 1a; and a second end thereof being connected to a support strip 11 mounted onto the lock 10.

[0055] One end of the cable portion 40a is made integral with the bolt 3.

[0056] In particular, said end of the cable portion 40a may be secured to a pin 90 whose body incorporates a threaded seat 91 according to the longitudinal axis α-α.

[0057] Said pin 90, suitably modified, e.g., by the addition of a tapping screw-shaped tip 92, is sunk into the bolt 3.

[0058] Said end of the cable portion 40a may be reeved through a transversal hole 94, obtained sideways in the body of the pin 90 and apt to intersect said threaded seat 91, so as to be pinched and held thereat by means of a pinch bolt 93 screwable in said threaded seat 91.

[0059] Moreover, the bolt 3, in its opening and shutting stroke, is apt to cooperate with a spring device 80.

[0060] Such a spring device 80 may e.g. comprise a support strip 81, fastened to the section of the leaf of the door 100 at a useful height in correspondence of the bolt 3, apt to provide a support and a sliding guide for the reciprocating shifting of an abutting element 82.

[0061] Such an abutting element 82 comprises a head intended to remain into contact with the bolt 3, whereas at the opposite end thereof a second cable portion 40b is fastened.

[0062] Coaxial to the abutting element 82 a return spring 83 is mounted, having weight and length calibrated so that the abutting element 82 follows the bolt 3 in its stroke and constantly keeps into contact therewith.

[0063] The configuration is such that, when the bolt 3 is slid into a shutting seat owing to the turns given by a user, the first cable portion 40a is pulled and it tightens, bringing the bottom bolt 2a in shutting position B.

[0064] Concomitantly, the second cable portion 4b is pushed and, aided by the advantageous contribution of the force of gravity, causes the release of the top bolt 2b in shutting position B.

[0065] Vice versa, when the bolt 3 is extracted from the shutting seat and brought back in the position engaged prior to the shutting turns, the top 2a and bottom 2b bolts are brought in an opening position A.

[0066] A second embodiment of the safety system according to the present invention provides that the actuating mechanism 20 be independent from the lock of the door 100, and be instead contained into a casing 21, preferably arranged near the door, e.g. in the masonry.

[0067] In figure 5 it is depicted a preferred variant of the actuating mechanism 20 for such a second embodiment, in which the actuating element positioned in the casing 21 is a rack 3 meshing with a sprocket 72.

[0068] The sprocket 72 is integral with a cylinder 71 pivotally inserted in the structure of the actuating mechanism 20, said cylinder being in particular capable of pivoting with respect to the casing 21.

[0069] A user's inserting of a key into the cylinder 71 and its turning produces a pivoting of the sprocket 72, to which there corresponds a proportional translation of the rack 3.

[0070] A first cable portion 40'a, connected to the bottom bolt 2a, is fastened to a first end of the rack 3.

[0071] A second cable portion 40'b, connected to the top bolt 2b, is fastened to a second end of the rack 3.

[0072] When a user turns the key anticlockwise, the first cable portion 40'a is pulled and it tightens, dragging the bottom bolt 2a topwise in shutting position B, whereas the second cable portion 40'b is subjected to a pull and it slides, followed and supported by the semi-rigid guides 41 in which it is inserted, until the top bolt 2b is released in shutting position B.

[0073] Vice versa, when the key is turned clockwise, the bottom 2a and top 2b bolt come to opening position A.

[0074] Evidently, the activating means may be contrived so as to activate the safety system according to the present invention from the inside of a given room as well as from the outside thereof, in case a user wishes to lock him/herself in said room, or, leaving it unattended, wishes to make sure that no one may enter therein in his/her absence, respectively.

[0075] For this purpose, in figure 6 it is exemplified a user's option to activate the safety system by inserting and turning a key in a seat in the mechanism 20 that is accessible from the inside of a room or from the outside thereof, respectively.

[0076] The actuating mechanism 20 will be modified so as to ensure the correct operation of the safety system, regardless of when it is activated from the inside or from the outside of a room, like, e.g., an apartment.

[0077] The present invention has hereto been described according to a preferred embodiment thereof, given by way of example and without limitative purposes.

[0078] To the above-described safety systems for

doors and the like, a person skilled in the art, in order to satisfy further and contingent claims, may effect several further modifications and variants, all however falling within the protective scope of the present invention, as defined by the appended claims.

Claims

1. A safety system applicable to doors or the like, comprising:

• at least one first box-type element (1a, 1b) placed in correspondence of a door (100);
• at least one blocking element (2a, 2b) housed in said box-type element (1a, 1b), movable between an opening position (A) in which it is not engaged to said door (100) and a shutting position (B) in which it is engaged to said door (100); and
• means for activating said safety system, comprising:

- an actuating element (3) incorporated in an actuating mechanism (10; 20);
- elements (40) for connecting said actuating element (3) to said blocking element (2a, 2b),

the configuration being such that said actuating element (3) causes the activation of said safety system via said connecting elements (40) bringing said at least one blocking element (2a, 2b) in said opening position (A) and in said shutting position (B).

2. The safety system according to claim 1, comprising a first blocking element (2a) and a second blocking element (2b), each housed in a respective box-type element (1a, 1b), apt to engage to a first and a second portion, respectively, of said door (100).

3. The safety system according to claim 2, wherein said actuating element (3) concomitantly produces opposite stresses on said connecting elements (40), so that they concomitantly bring in a shutting position (B) or in an opening position (A) the blocking elements (2a, 2b).

4. The safety system according to claim 1 or 2, wherein said blocking element is a bolt (2a, 2b) partially extractable from a seat (5) obtained in said box-type element (1a, 1b) and apt to partially engage to said door (100) when it assumes said closing position (B).

5. The safety system according to one of the claims 1 to 4, wherein said connecting elements are cables (40).

6. The safety system according to the preceding claim, wherein said cables (40) are inserted into basically semi-rigid guide sheaths (41).

7. The safety system according to the preceding claim, wherein said guide sheaths (41) are connected to said box-type elements (1a, 1b) and to said actuating mechanism (10; 20) via disassemblable connecting means (42; 43; 44).

8. The safety system according to claim 4, wherein said seat (5) obtained in said box-type element (1a, 1b) is substantially tubular and comprises guides (7) for the shifting of the respective blocking element (2a, 2b) housed therein.

9. The safety system according to claim 8, wherein said guides are longitudinal guide slits (7) for the translation of said blocking element (2a, 2b).

10. The safety system according to claim 9, comprising elements (8) for fastening each of said blocking elements (2a, 2b) to said connecting elements (40), said fastening elements (8) being integral with each respective blocking element (2a, 2b) and apt to slide along said longitudinal guide slits (7), so as to allow the translation of said blocking element (2a, 2b).

11. The safety system according to one of the preceding claim, wherein said box-type elements (1a, 1b) comprise an open main body (50) and a cover (60) for said main body (50), said cover (60) incorporating said seat (5) for said blocking element (2a, 2b).

12. The safety system according to the preceding claim, wherein said cover (60) or said open main body (50) incorporates a plurality of grommets (9) to foster the guided sliding of said connecting elements (40).

13. The safety system according to one of the preceding claims, wherein said actuating mechanism (10; 20) is placed near said door (100); and wherein said actuating element (3) may be activated by inserting a key.

14. The safety system according to any one of the preceding claims, wherein said actuating mechanism is a lock (10) of said door (100) and said actuating element is a bolt (3) of said lock (10) apt to cooperate with a spring device (80) to bring said blocking element (2b) from said opening position (A) to said closing position (B) and vice versa.

15. The safety system according to any one of the preceding claims, comprising a control unit of the actuating mechanism (10;20) in communication with a remote unit for activating said safety system by the transmission of electronic commands.

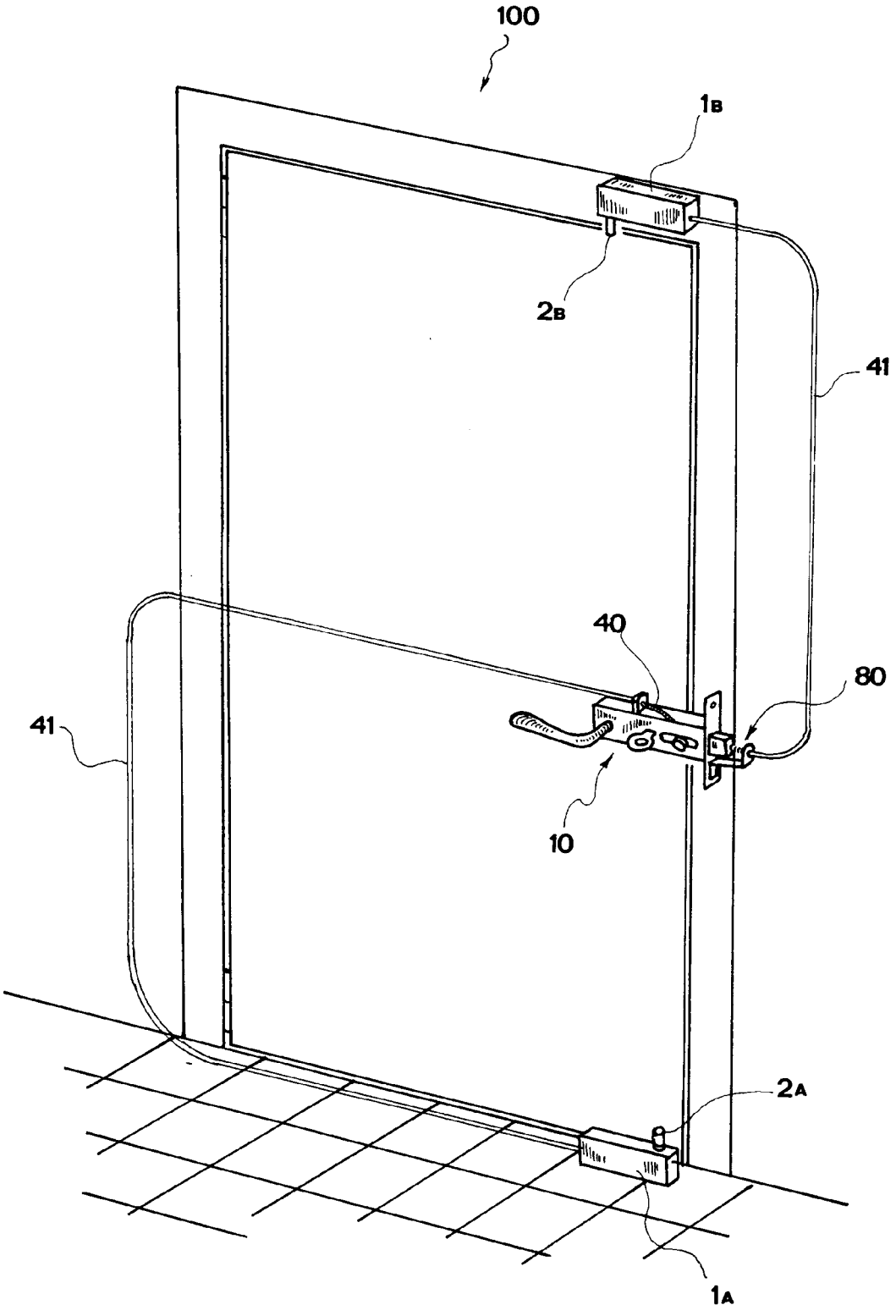

FIG.1

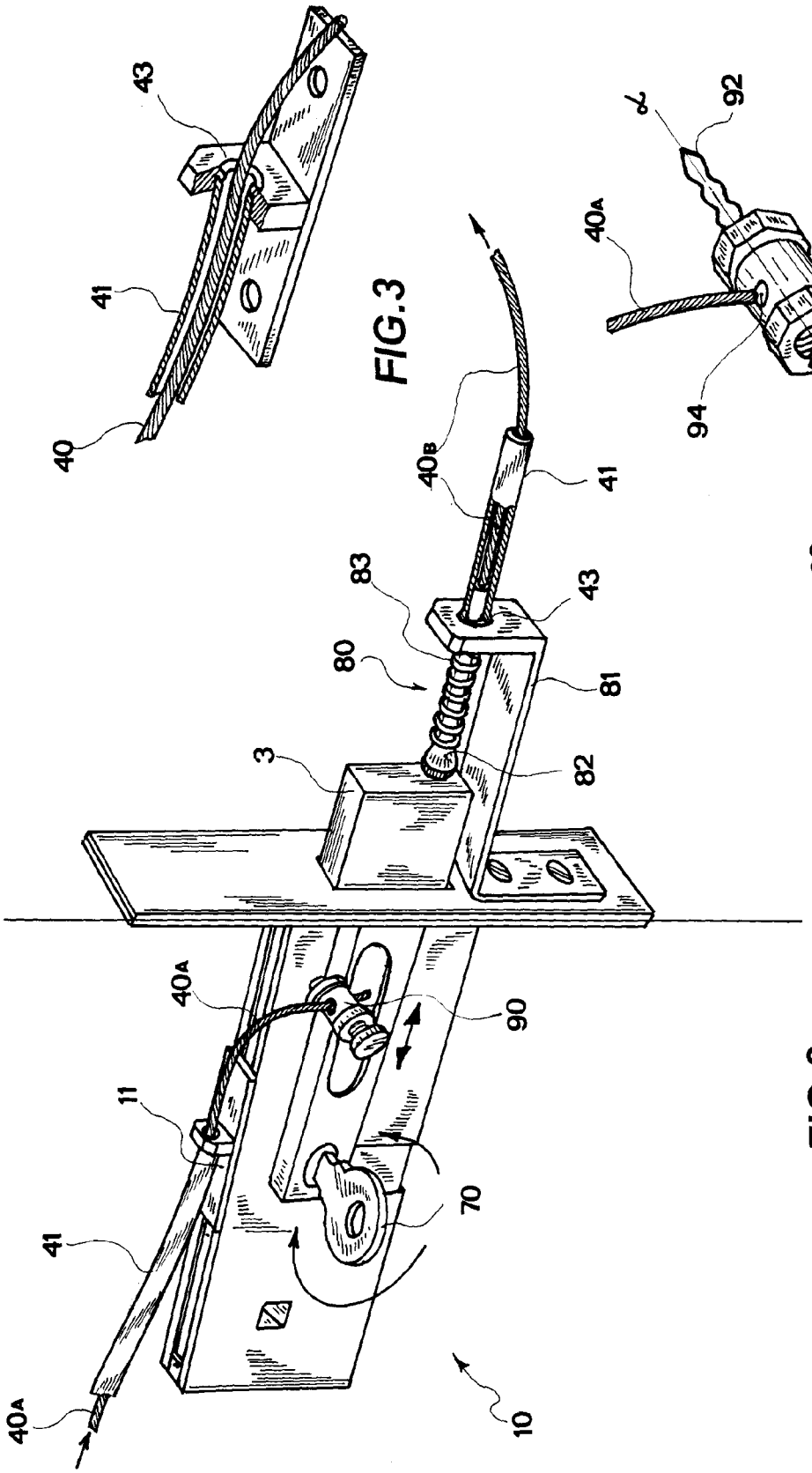

FIG.2

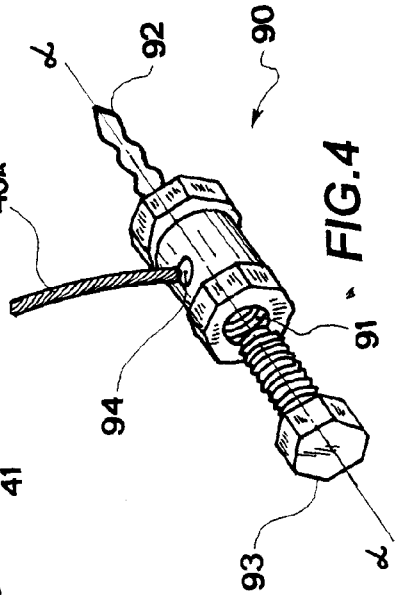

FIG.4

FIG.3

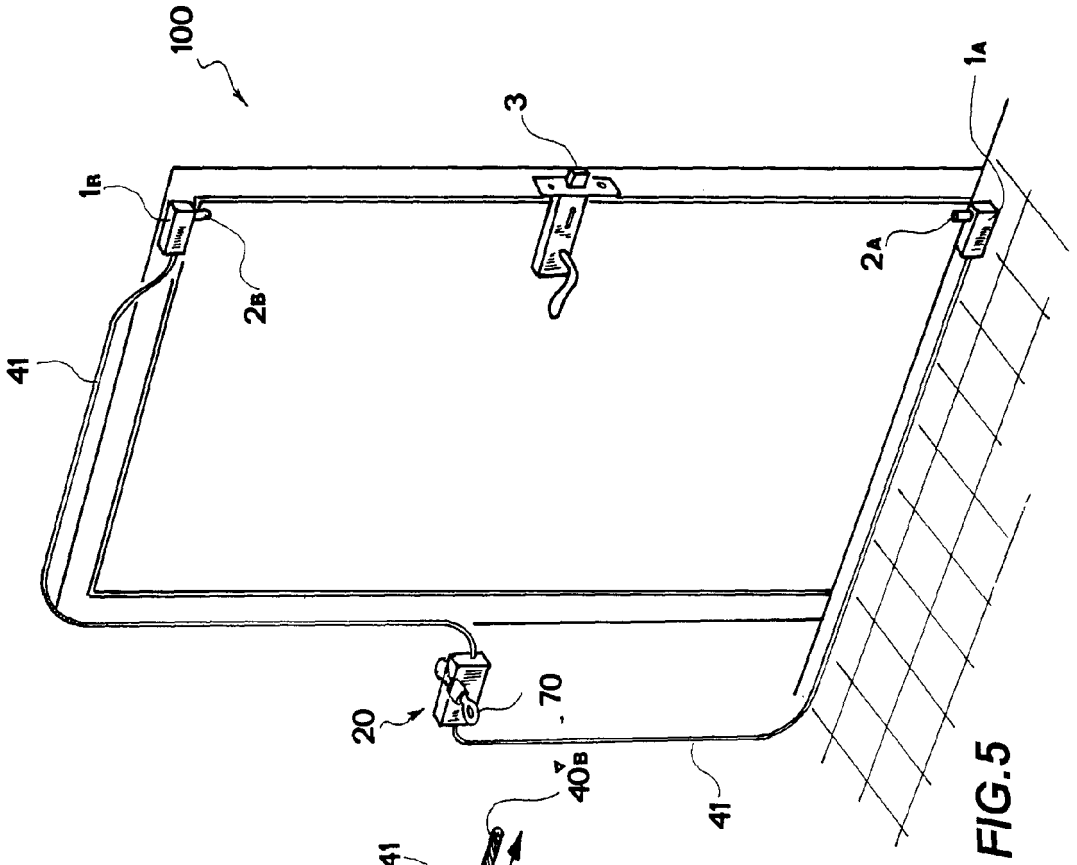

FIG.5

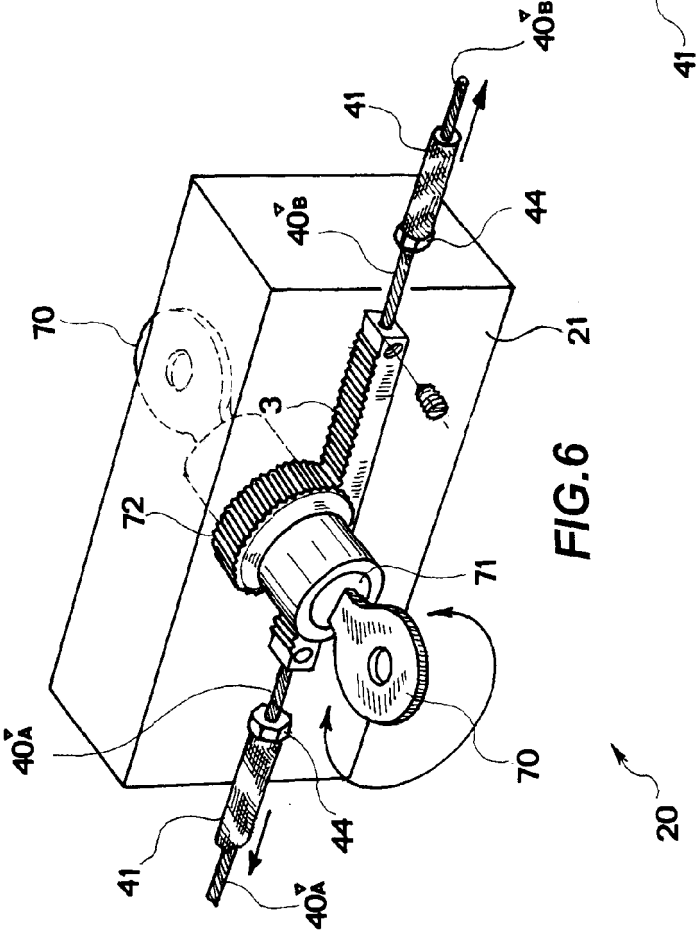

FIG.6

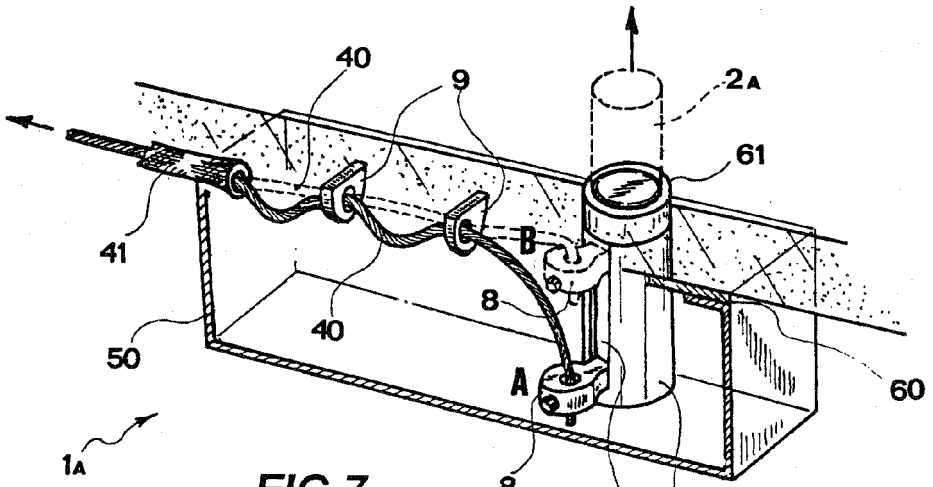

FIG.7

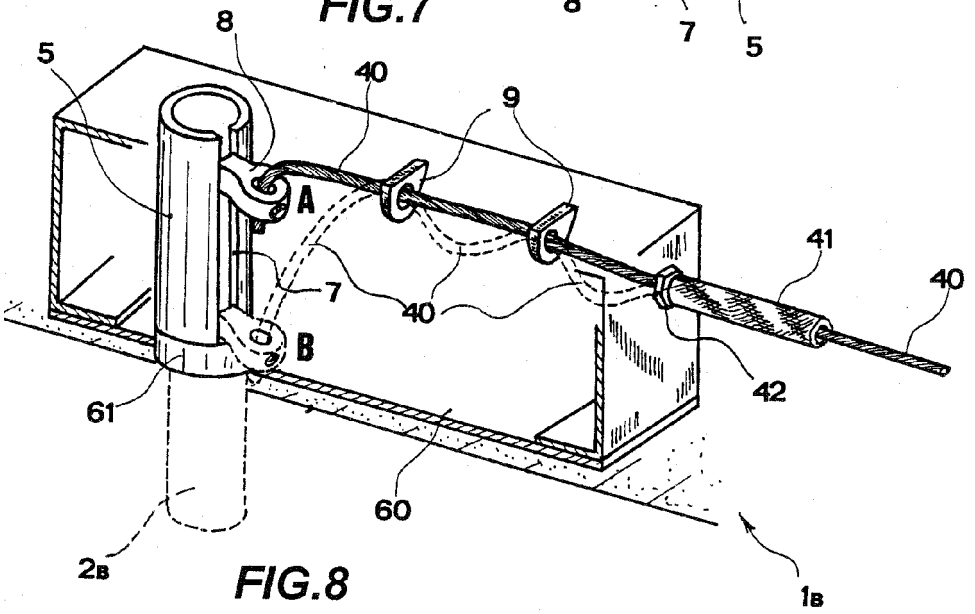

FIG.8

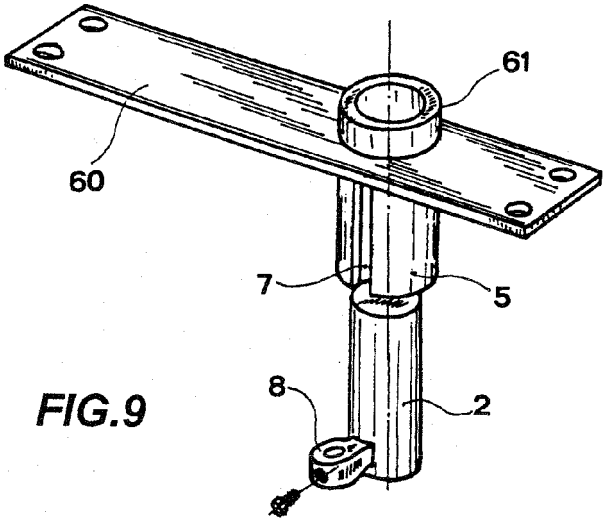

FIG.9

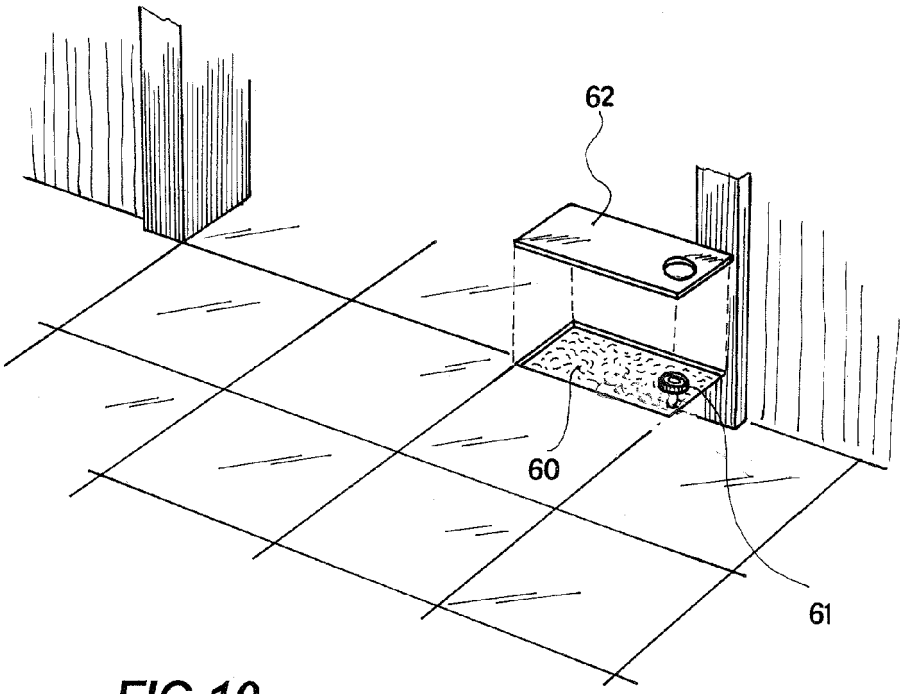

FIG.10

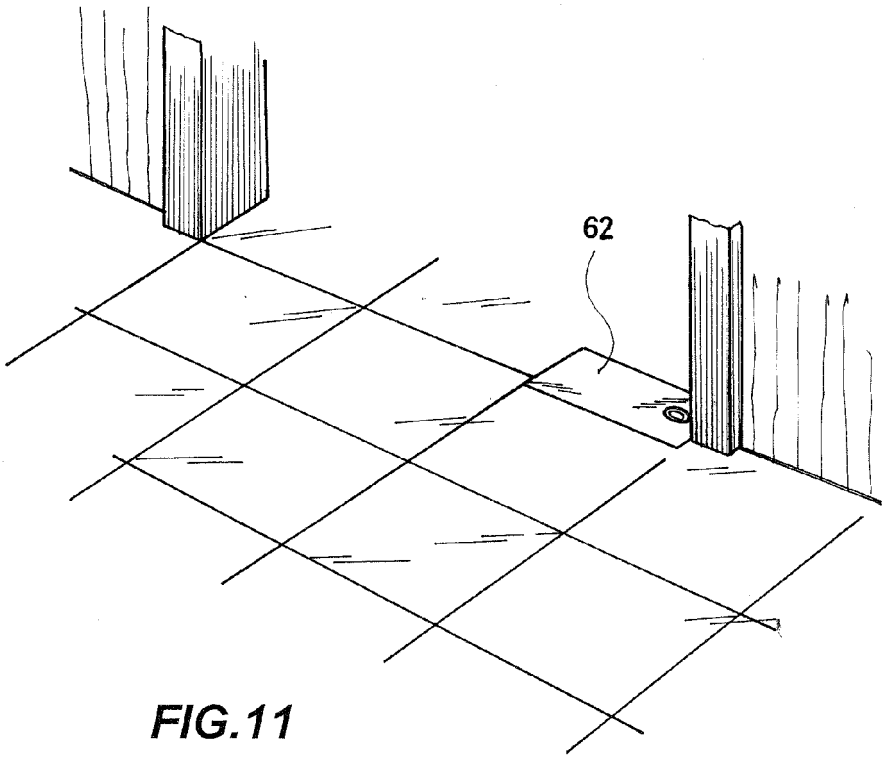

FIG.11