

12 EUROPEAN PATENT APPLICATION

21 Application number: 83105906.8

51 Int. Cl.<sup>3</sup>: E 05 B 47/06

22 Date of filing: 16.06.83

30 Priority: 21.06.82 IT 495182 U

43 Date of publication of application:  
25.01.84 Bulletin 84/4

84 Designated Contracting States:  
AT BE CH DE FR GB LI LU NL SE

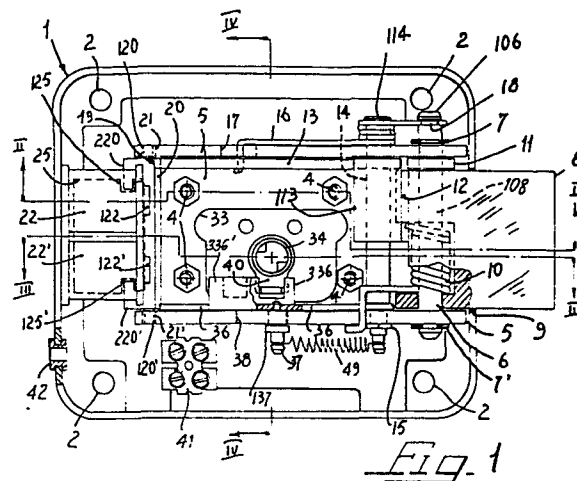
71 Applicant: VIRO INNOCENTI S.p.A.  
Via Garibaldi 4  
I-40069 Zola Predosa(IT)

72 Inventor: Vanelli Coralli, Giorgio  
4, Via M. L. King  
I-40132 Bologna(IT)

74 Representative: Porsia, Dino, Dr. et al,  
c/o Succ. Ing. Fischetti & Weber Via Caffaro 3  
I-16124 Genova(IT)

54 Improved electric lock of the swingable latch type.

57 An electric lock of the swingable latch type, in that the latch (8) is biased by a spring (10) into its door-opening position, but is held into its door-locking position by the suitably shaped projecting portion (12) of an associated member (108) engaged in means (113) at one end of, and integral with lever (13) fulcrumed about pivot (14) parallel to pivot (6) pivotably supporting the latch (8), and biased by a spring (16) in the proper direction for engagement of means (113) with the projecting portion (12) of member (108), and into engagement through the stepped portion (19) formed in its opposite end remote from latch (8) with the top end of a flat lever (20) of ferromagnetic material, provided with lateral appendices (120-120') respectively extending at right angles from the top and bottom end thereof, with their axis being parallel to the pivots (14 and 6), and by which the lever (20) is swingably mounted in circular seats (21-21') at the upper and lower end of the wings of the support member (5), the top end of lever (20) being swung into engagement with the stepped portion (19) of lever (13) by the plungers (122-122') of solenoids (22-22') axially urged by springs (24) toward lever (20), and being drawn out of engagement with the said stepped portion (19) by the activation of solenoids (22-22'), resulting in the plungers (122-122') being drawn into the interior of the respective solenoid (22-22'), whereby the latch (8) is swung into its door-opening position.



VIRO INNOCENTI S.p.A.

Improved electric lock of  
the swingable latch type.

5       The present invention relates to an electric lock  
of the swingable latch type which differs from the locks  
of known kind owing to the fact that it presents a  
simplified construction and particularly a higher degree  
of dependability in its performance.

10       These and other aspects of the lock according to  
the invention will become more clearly apparent in the  
following specification made with reference to the figures  
of the two annexed sheets of drawings, in which:

15       Figure 1 is a front elevational view of the lock  
mechanism with the lock casing cover omitted;

20       Figures 2 and 3 show further details in the  
construction of the lock mechanism, in a section re=  
spectively taken on line II-II and on line III-III of  
figure 1;

Figure 4 is a side view of the complete lock ready to be put in use, with parts in section on line IV-IV of figure 1.

5           As shown in the figures, the lock mechanism is included in a suitably ribbed casing 1 provided with bores 2 for insertion of screws 3 used for installing the lock. At the interior of casing 1 a U-shaped support frame 5 is placed with its longitudinal axis on the centerline  
10 of the casing, and is fastened to the bottom thereof by means of screws 4. All the mechanical components of the lock are fitted onto the said support frame 5. At one end of the wings of support frame 5 a pivot 6 arranged parallel to the endwall and to the adjoining sidewall of casing 1  
15 is immovably mounted, and is held in place by circlips 7, 7'. Between the wings of support 5 a swingable latch 8 of suitable known shape and projecting out of slot 9 in casing 1, is pivotably mounted onto pivot 6 received in a swelling extension or web 108 connected with latch 8 and  
20 provided with a recessed intermediate portion for housing a cylindrical helical torsion spring 10. By the torsion spring 10 the latch 8 is urged into the position shown with dash lines in figure 2. The spring 10 is wound round that portion of pivot 6 clear of latch 8, and is anchored  
25 by one end to latch 8 and by the other end to one of the wings of support frame 5. Numeral 11 denotes a distance washer fitted on pivot 6. The swelling extension or web 108 provided for latch 8 presents in cross-section the profile of a circle sector, arranged co-axially to pivot 6,  
30 and has its upper end formed with a step or catch member 12.

When the latch 8 is in its door-locking position shown with solid lines in figure 2, the catch member 12 is overlappingly engaged by the lower side of a U-shaped straddle member or dog 113 which by its wings is pivotably mounted onto a pivot 14 supported in the wings of support frame 5 and in parallel relation with pivot 6. Pivot 14 is held in place by a circlip 15 applied to the tapered lower end of this pivot.

10           The dog 113 is made of one piece with a flat lever 13 arranged behind the upper wing of support frame 5 and urged in the outward direction relatively to casing 1 by a torsion spring 16 wound round the upper end of pivot 14 projecting out of support frame 5. Through an opening 17  
15           formed in the adjoining wing of support frame 5, one end of torsion spring 16 is anchored to the intermediate part of said lever 13, while its other end is anchored to an extension 106 of pivot 6, in which an annular recess 18 is provided for this purpose. The inward end of lever 13,  
20           remote from latch 8, is formed with a step 19, and when the lock mechanism is in the door-fastening condition, this step 19 is engaged by a flat lever 20 made of ferromagnetic material. By its opposite lateral appendices 120-120', the axis of which is parallel to the axis of  
25           pivots 14 and 6, the lever 20 is swingably mounted in the circular seats 21-21' provided in either wings of support frame 5. Two solenoids 22-22' having like operating features, are positioned beside lever 20 and are secured at 23 to the adjacent wall of casing 1. The plungers  
30           122-122' of solenoids 22-22' are axially urged by springs

24 in the direction of lever 20, so as to keep the said lever in the position for holding the latch 8 in the door-locking position. The activation of solenoids 22-22' results in the plungers 122-122' being drawn into the interior of the respective solenoid 22,22', whereby the lever 20 is electromagnetically drawn out of engagement with the step 19 in lever 13. Consequently, the latch 8 being under the prevalent bias of spring 10, swings into its door-opening position shown with dash lines in figure 2, and the lever 13 moves into the position shown with dash-and-dot lines in figure 2. The lock mechanism will be automatically returned into its door fastening condition, in which it holds the latch clamped, whenever the latch 8 is swung into door-locking engagement with the selvage (not shown) fixedly secured in the door frame. Now the step or catch member 12 in the latch swelling extension or web 108 is again moved into engagement with the lower side of dog 113 straddling it, and the lever 13 again swings in the outward direction, so that the lever 20 can swing into abutment with the underside of step 19 at the end of lever 13.

By examining figures 1, 2 and 3, it appears that the lever 20 has its top and bottom portions formed with hook-shaped facing extensions 220,220', respectively, so that it presents in cross-section a double-L profile. The extensions 220,220' are loosely fitted in, and cooperate with the sideward notches 125,125' in a metal platelet 25 bearing on the end wall of casing 1 and which is held in place by the body of solenoids 22-22', that however allow

the unhindered movement of said platelet 25. Platelet 25 constitutes a ballast of a suitable weight, which prevents the swinging of lever 20 into its door-opening position any time the lock will be subjected to rather strong shocks or stresses with a component in the direction of arrow F shown in Figure 2. In fact, the dynamic stress which in such a case might act on the plungers of solenoids 22-22', would be exerted on ballast 25 in the same direction as on the lock, whereby any undesired component thereof causing the lever 20 to swing into its door-opening position, will be avoided.

The electrically operated lock mechanism according to the invention can be also operated by means of a suitably coded key. As shown in figure 4, the casing 1 is provided for this purpose with a cover 26 onto which the unit 27 of a key-controlled safety lock is fixedly mounted. By means of screws 28 the cover 26 is secured to casing 1, and by means of screws 29 the safety lock unit 27 is secured to said cover 26. With the interposition of a distance piece 31, a key-controlled safety lock unit 32 is secured by means of screws 30 to the external side of the endwall of casing 1, and is arranged opposite to, and into alignment with the safety lock unit 27. The bottom of support 5 is provided with an opening 33 (see figure 1) permitting to fit in the screws 30 and exposing a sufficiently large portion of the backwall of casing 1. In the said exposed portion of the casing endwall there is rotatably mounted a bushing 34 (figure 3). The internal wall of bushing 34 is suitably shaped, so as to be adapted

for cooperating with one end of a small drive bar 35 which by its opposite end is connected to the rotary cylinder of the safety lock unit 32.

5           As shown in figures 1 and 3, a flat bar 36 is arranged near the inner side of the bottom wing of support 5 and is slidable in the longitudinal direction. The bifurcated end 136 of the flat bar 36 is engaged by pivot 14, and its opposite rounded end 236 cooperates with the upper portion of lever 20. A pin 37 is secured to the  
10 intermediate side portion of the flat bar 36, and is passed through a slot 38 formed in the adjoining bottom wing of support 5, so as to project downwardly therefrom. The downward end of pin 37 is anchored to one end of  
15 extension spring 49, which by its opposite end is anchored to pivot 14. Fitted on pin 37 is a sleeve collar 137 cooperating with the outer side of the bottom wing of support 5, and serving as guide member for the flat bar 36. Because of the presence of said collar 137, the slot  
20 38 is provided at one end with an expanded portion 138 of a size which is sufficiently wide for receiving the sleeve collar 137. At its intermediate edge portion, the longitudinally slidable bar 36 is provided with two parallel, inwardly extending wings 336-336'. The wings 336-336' have  
25 an opening 39-39' formed therein, in which there is engaged the inward end of the L-shaped levers 40-40', respectively keyed onto the rotary barrel of the safety lock unit 27 and onto the bushing 34. When either of the safety lock units 27 or 32 is operated, the longitudinally  
30 slidable bar 36 will be shifted toward lever 20, so as to

cause the said lever to swing into the position for opening the door. Fastened to the endwall of casing 1 is a terminal block 41 to which the terminals of solenoids 22-22' are connected. The terminals of the cable supplying  
5 electric energy to the electric lock of the invention, to be inserted into the casing through bush 42, will be also connected to said terminal block 41.

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CLAIMS

1. An electric lock of the swingable latch type, characterized by the fact that the latch (8) is biased by  
5 a spring (10) into its door-opening position, but is held into its door-locking position by the suitably shaped projecting portion (12) of an associated member (108) engaged in means (113) at one end of, and integral with lever (13) fulcrumed about pivot (14) parallel to pivot  
10 (6) pivotably supporting the latch (8), and biased by a spring (16) in the proper direction for engagement of means (113) with the projecting portion (12) of member (108), and into engagement through the stepped portion (19) formed in its opposite end remote from latch (8) with  
15 the top end of a flat lever (20) of ferromagnetic material, provided with lateral appendices (120-120') respectively extending at right angles from the top and bottom end thereof, with their axis being parallel to the pivots (14 and 6), and by which the lever (20) is swingably  
20 mounted in circular seats (21-21') at the upper and lower end of the wings of the support member (5), the top end of lever (20) being swung into engagement with the stepped portion (19) of lever (13) by the plungers (122-122') of solenoids (22-22') axially urged by springs (24) toward  
25 lever (20), and being drawn out of engagement with the said stepped portion (19) by the activation of solenoids (22-22'), resulting in the plungers (122-122') being drawn into the interior of the respective solenoid (22-22'), whereby the latch (8) is swung into its door-opening  
30 position.

2. An electric lock of the swingable latch type according to claim 1, characterized by the fact that the lever (20) is formed with opposed hook-shaped extensions (220-220') loosely fitted in, and cooperating with the  
5 sideward notches (125-125') in a metal platelet (25) placed under, and held in place by solenoids (22-22') so as to allow its unhindered movement, the said platelet (25) being provided in order to neutralize any dynamic stresses which might cause the said lever (20) to swing  
10 out of engagement with the stepped portion (19) in lever (13), which promotes the swinging of latch (8) into its door-opening position.

3. An electric lock of the swingable latch type  
15 according to claims 1 and 2, characterized by the fact that all the mechanical components thereof are mounted onto a U-shaped frame secured to the inner side of the endwall of the lock casing (1).

20 4. An electric lock of the swingable latch type, characterized by the fact that a safety lock (27-32) is also provided, whereby the electric lock can be also controlled by means of a suitably coded key.

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