

G. G. BERG.  
ELECTRICALLY CONTROLLED LOCK.  
APPLICATION FILED APR. 6, 1916.

1,262,435.

Patented Apr. 9, 1918.  
2 SHEETS—SHEET 1.

Fig. 1.

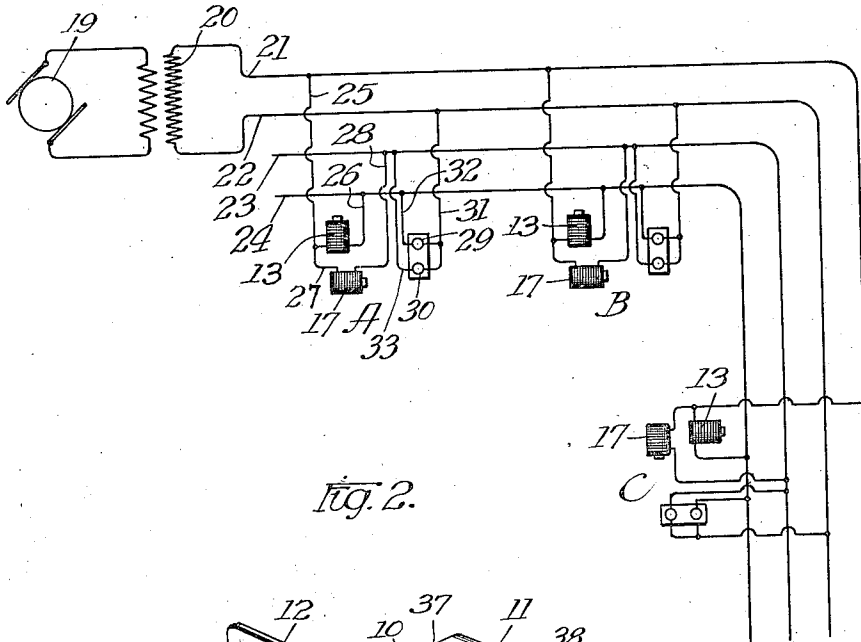
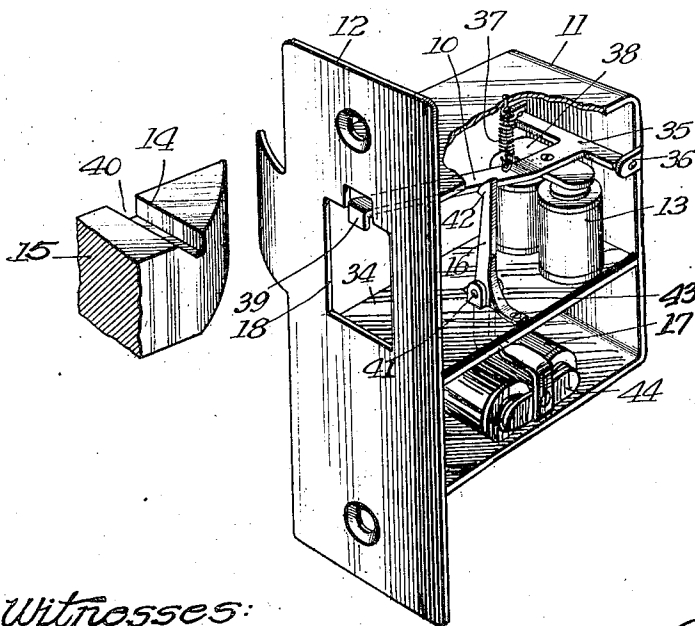


Fig. 2.



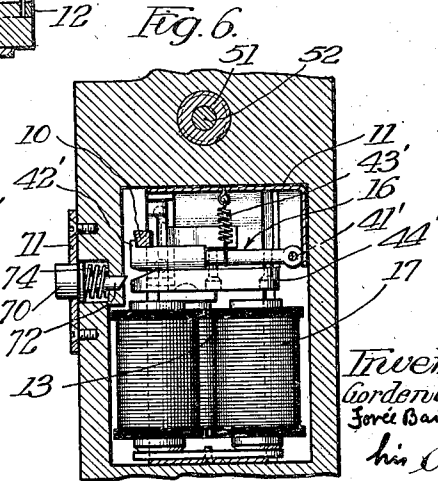
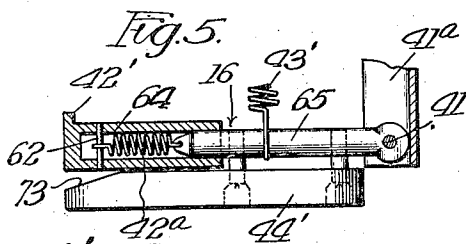
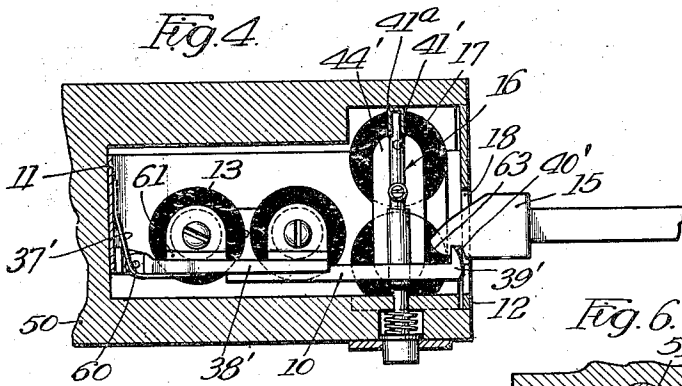
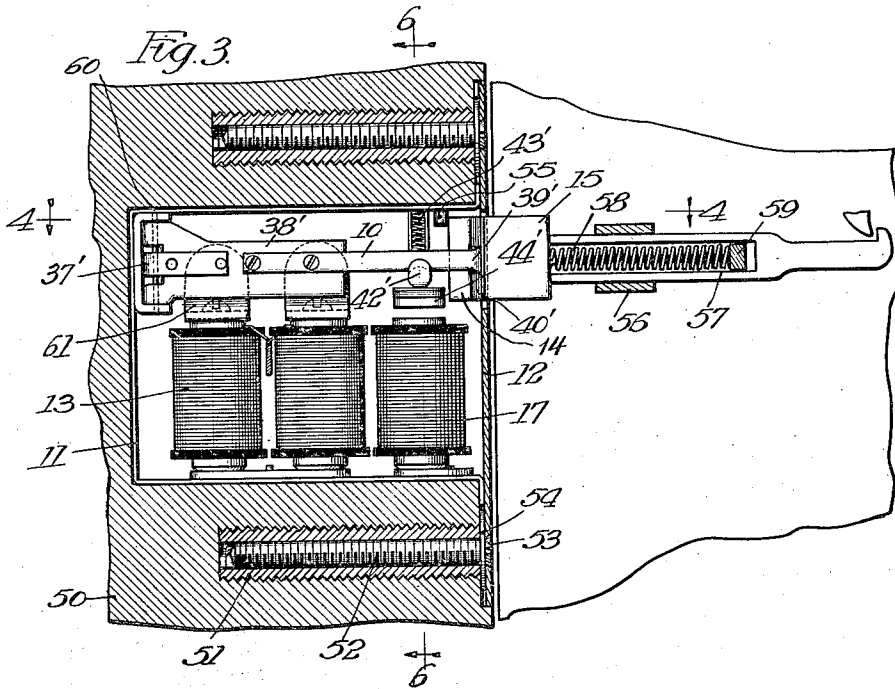
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

GORDEN G. BERG, OF CHICAGO, ILLINOIS.

## ELECTRICALLY-CONTROLLED LOCK.

1,262,435.

Specification of Letters Patent. Patented Apr. 9, 1918.

Application filed April 8, 1916. Serial No. 89,345.

*To all whom it may concern:*

Be it known that I, GORDEN G. BERG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrically-Controlled Locks, of which the following is a specification.

This invention relates to improvements in locks and more particularly to a means for controlling from a remote point the conditioning of a door lock whereby it may be positively latched to prevent its manual operation, or may be released to permit such operation.

There are many instances where it would be of great advantage to be able, from a remote point, to positively disable several locks, so that they cannot be manually unlocked, and at other times to render inoperative the disabling means so that the functions of the locks as to their manual control will not be interfered with.

I am aware that many types of lock release devices are used on apartment doors and in similar places, but it is to an entirely different arrangement that my invention is directed. In the usual form of lock release, such as above referred to, the locking mechanism is normally set to prevent opening of the door and closing a circuit at a remote point disables the lock and permits the door to be opened, the lock being disabled only while the circuit is maintained closed. In my apparatus as applied to the ordinary handle operated door lock (though it obviously may be applied to many and various other locking devices) the handle operation of the lock is normally not interfered with, but should it be desirable to lock the handle actuated bolt so that it cannot be operated by the handle, momentary closure of a circuit latches the bolt preventing its movement until released by a subsequent momentary closure of another circuit, permitting the door lock to be actuated by the handle again.

It is especially in connection with the locks on a plurality of doors entering a single room, as for example a bath room that my invention finds particular usefulness. Quite frequently a bath room connects adjoining bed rooms and thus has two doors, and perhaps a third opening to a hall. With the present arrangement the occupant after entering through one door to insure privacy,

must go to each of the other doors and turn the latches. The advantage of having a button on the inside of the casing of each door so that on entering the door one may press the "lock" button and instantly latch all three doors so that they cannot be opened is obvious. On leaving the room by the same, or any other door, the pressure on a "release" button will disable the latching mechanisms and permit the opening of any of the doors. Whereas there are many and various associations in which this latching device may be used to great advantage, I have cited merely this one instance as illustrative of its application.

The principal object of my invention therefore is to provide means for positively disabling the door lock when in its locked position by the momentary closure of an electric circuit and means for releasing the lock by the momentary closure of another circuit.

Another object of my invention is to provide such an arrangement which may be readily inserted in the casing of a door for cooperation with the usual form of bolt action.

Another object of my invention is the provision of such apparatus in which shrinkage or swelling of the door or settling of the building may be readily and quickly compensated for.

Still other and further objects will become readily apparent to those skilled in the art from a consideration of the following description and drawings wherein—

Figure 1 is a wiring diagram of an installation showing three locks and control stations.

Fig. 2 is a perspective view with parts broken away, showing one form of latch mechanism and its associated bolt.

Fig. 3 is a vertical sectional view through another form of latch mechanism and bolt showing two different methods of compensating for shrinkage, swelling or settling of the door or casing.

Fig. 4 is a horizontal sectional view on the line 4—4 of Fig. 3.

Fig. 5 is an enlarged detail view of one of the latch members and its armature with parts broken away.

Fig. 6 is a vertical sectional view on the line 6—6 of Fig. 3.

In both of the modifications of my invention which I have illustrated, the apparatus

comprises in general a latch 10 pivoted within a frame 11 carried at the rear face of the striker plate 12 and adapted on the actuation thereof as by electromagnets 13 to engage  
 5 with a shoulder 14 formed on the reciprocating bolt 15 carried by a door. The latch 10 is normally spring held in an inoperative position, but when actuated by the magnet 13 is positively moved into engagement with  
 10 the shoulder on the door bolt 15 in which position it is maintained by means of a spring actuated pawl 16. This pawl 16 is in turn capable of being moved into its latch releasing position by means of a magnet 17.  
 15 From the above it will be evident that, considering the door as closed and the bolt 15 as lying within the aperture 18 in the striker plate 12 momentary energization of the magnet 13 will draw the latch member  
 20 10 into engagement with the shoulder 14 in which position it is held by the spring actuated pawl 16. Under these conditions it is impossible for the bolt 15 to be withdrawn, and the door is securely locked in  
 25 this position. When the operator desires to unlatch the bolt, so as to condition it for manual movement, the magnet 17 is energized momentarily moving the pawl 16 out from engagement with the latch 10  
 30 which is resiliently moved into its inoperative position. The door bolt 15 is then free to be turned either by a handle or key.  
 As previously stated this apparatus is particularly adapted for use in connection with  
 35 bath rooms and the like, where two or three doors can be simultaneously latched or unlatched from any one of a corresponding number of points. As indicating a simple wiring system for such an installation I  
 40 have shown in Fig. 1 a source of current at 19 stepped down through the transformer 20, such as is commonly used for door bell operation, to six or eight volts, across the feed wires 21, 22. As illustrating a typical  
 45 installation, I have shown three sets of apparatus A, B and C as mounted on three doors of a room. The feed wires 21, 22 and two control wires 23, 24 lead to each installation. The wiring of each set, A, B  
 50 and C is identical. Magnet 13 is connected by wires 25 and 26 across feed wire 21 and control wire 24, the other magnet 17 being connected by means of wires 27 and 28 across the same feed wire 21 and the opposite control  
 55 wire 23. A pair of push buttons 29 and 30 are both connected at one side by wire 31 to the opposite feed wire 22, the other side of button 29 being connected by wire 32 to control wire 24, and the other  
 60 side of button 30 connected by wire 33 to control wire 23.

As the wiring connections in each installation are identical, it will be obvious that the closure of the button switch 29 will

cause current to pass from feed wire 22 into  
 control wire 24 from which it passes through  
 each of the magnets 13 at installations A,  
 B and C and back to feed wire 21. On the  
 other hand pressure upon button 30 will  
 connect feed wire 22 in circuit with control  
 70 wire 24 thus placing the magnets 13 of each set in parallel across feed wires 21 and 22.

Referring more particularly to the embodiments of my invention which I have illustrated in the drawings,

Fig. 2 shows a simple form of apparatus in which the casing 11 secured to the rear face of the striker plate 12 has a horizontal partition 34 upon the upper face of which is mounted the magnet 13. The rear end of the latch 10 is formed into a cross bar 35, the ends of which are pivoted in the nubs 36 struck from the sides of the casing and turned at right angles. A spring 37 normally holds the latch in its uppermost  
 80 position as illustrated in Fig. 2, and an armature 38 is secured to the latch in position to overlie the upper end of the magnet 13. The front end of the latch 10 is hooked downwardly, as at 39, for engagement with the horizontal slot 40 formed in the bolt 15. The formation of the slot 40 provides a shoulder 14, heretofore referred to, against which the hooked end 39 of the latch engages.

As it is essential to the operation of my apparatus that the latch after once having been drawn down to locking position by momentary energization of the magnet be held in this position without maintaining a  
 100 flow of current through the magnet, I have provided a vertical pawl 16 which projects upwardly through an opening in the partition 34 and is pivoted as at 41 on lugs struck up from the partition 34. The upper end  
 105 of the pawl 16 is provided with a head 42 which is normally pressed into engagement with the latch 10 by means of a leaf spring 43. As the latch 10 is moved downwardly under the influence of the magnet  
 110 the pawl head 42 is spring pressed into engagement therewith, locking it in its downward position. The lower end of the pawl 16 is provided with an armature 44 adapted for cooperation with the magnet 17. On  
 115 energization of the magnet 17 the armature 44 is drawn to the left swinging the head 42 of the pawl to the right out from engagement with the latch which is thereupon retracted by means of the spring 37 thus free-  
 120 ing the door bolt 15, conditioning it for manual operation.

In Figs. 3 to 6 inclusive I have illustrated a somewhat different embodiment of the invention. In this form I have shown a structure whereby the striker plate 12 is provided with means for mounting it in the door casing 50 so that it may be moved outwardly

or inwardly to compensate for shrinking or swelling of the door or casing. To accomplish this I have provided a pair of hollow wood screws 51, taking into apertures in the frame 50 and internally threaded to receive the screws 52, the outer ends of which are flanged to provide heads 53 overlying the outer face of the striker plate, and having shoulders 54 lying against the inner face of the striker plate. By this arrangement rotation of the screw heads 53 inwardly or outwardly cause the striker plate to move inwardly or outwardly, permitting its ready adjustment with respect to the door.

As a further means for adjustment so as to insure the proper cooperation between the latch member 10 and the slot 40' of the bolt 15 I have provided an automatic adjustment of the bolt 15 whereby its head will always enter the opening 18 in the striker plate a predetermined distance. This distance is fixed by means of a pin or abutment 55 carried by the casing 11. The inner end of the bolt 15 is suitably guided as at 56 and slotted, as at 57, to receive a compression spring 58, one end of which abuts against the head 15 of the bolt and the other end of which abuts against a fixed stop 59 within the slot 57. The member 59 is positioned a short distance from the end of the slot 57 so that when the door is opened and the bolt is out of engagement with its stop 57 it is permitted to advance but a short distance beyond the normal position occupied by it when in engagement with the striker plate. With this arrangement the bolt will always advance into the striker plate a fixed distance, that is, providing the door is not shrunk so as to space its edge away from the striker plate a distance greater than the space between the stop or abutment 59 and the end of the slot in the bolt.

Referring now to the latch mechanism, shown in Figs. 3 to 6, it will be noted that the latch 10 instead of being pivoted on a horizontal axis, as in the simpler form shown in Fig. 2, is pivoted on a vertical axis 60 so that the hooked end 39' engages a vertical slot 40' in the bolt 15. This is to permit of a relative vertical movement between the striker plate and the bolt, such as might be caused by settling of the door frame. In the present instance I have illustrated a leaf spring 37' as normally holding the latch 10 out from engagement with the slot 40'. The electromagnets 13 are mounted directly upon the bottom of the casing 11 and carry upstanding ear like extensions 61 of their poles to permit the movement of the latch armature 38' in a horizontal plane. In the present instance it is obvious that the automatic latch detent must

be positioned to hold it from horizontal movement after it has moved into engagement with the slot in the bolt rather than from vertical movement, as in the first instance. For this purpose I have provided a horizontally disposed detent 16 pivoted as at 41' on a projection 41<sup>a</sup> of the casing 11. This detent is normally resiliently held in its uppermost position by means of the coil spring 43', its headed end 42' being adapted to automatically engage the latch 10 and hold it in its bolt latching position. The detent armature 44' is carried below the detent for cooperation with the upper end of the magnet 17. The operation of the improved form, in so far as I have thus far described it, obviously is identical with that of the first described embodiment.

As a further refinement of the invention I have beveled off the forward nose or end of the bolt head 15 and provided for a resilient extension or elongation of the detent 16 so that in case the operator should press a button latching the doors when one of the doors is open and subsequently close that door, it will automatically lock. Obviously with the embodiment shown in Fig. 2, the door cannot be locked if the latch 10 has been depressed while the door was open. It is a possibility that a person entering a room might leave the door through which he enters open, and then after pressing the "lock" button desire to close the door through which he has entered and lock that. This is possible in the modification shown in Figs. 3 to 6, as the forward end of the bolt head 15 is beveled off, so that after the door is closed, the latch being considered in its locked position, the beveled off end when impelled forward by the spring 58 will wedge the hooked end 39' of the latch 10 to one side, this being permitted by the extensible detent 16, and as soon as the hooked end 39' coincides with the slot 40' in the head, the latch will spring into place and perform its function.

As a simple means of providing for the extensibility of the detent 16' I have provided the headed end section 42' with a tubular opening 64 which telescopes over the pin portion 65 which is pivoted, as at 41'. A spring 42<sup>a</sup> is positioned within the tubular opening in the headed portion 42' and connected at one end to the pin 65 and at its opposite end to a pin 62 extending through the head. Obviously the spring 42<sup>a</sup> must exert a greater pull on the head 42' than that exerted by spring 37' when the parts are in latched position.

As a precaution against the possibility of an operator leaving the door through which he enters the room open, pressing the "lock" button and subsequently leaving the room through the opened door and shutting

it after him, thus locking all of the doors without the presence of anyone in the room, I have provided a manually operated lock release which can be positioned in conjunction with one of the locks, for example that leading into the owner's room. This device takes the form of a push button 70 projecting through the plate 71, and carrying on its inner end a rod 72, the extreme inner end of which is beveled off, for cooperation with the beveled end 73 of the armature 44'. The button is normally resiliently held in its outermost position by a spring 74. Pressure on the button 74 causes the beveled end of the pin 72 to engage the beveled end 73 of the armature 44, depressing the same and releasing the latch member 10' permitting the door to be opened.

Whereas I have illustrated and described but two embodiments of my invention it is obvious that various changes might be made therein without departing from the spirit thereof or the scope of the appended claims.

Having described my invention, what I claim is:—

1. The combination with a door lock bolt having a shoulder formed thereon, of a pivotally mounted normally inoperative latch arm having a projection adapted to engage said shoulder when the bolt is in door locking position and hold the same from movement, magnetically actuated means for moving said latch into engagement with the shoulder on the bolt, and releasable means for positively holding the latch in engagement with the bolt.

2. The combination with a door lock bolt having a transverse slot formed therein, of a pivotally mounted normally inoperative latch arm, having a hooked end adapted to engage said slot when the bolt is in door locking position and hold the same from movement, magnetically actuated means for moving said latch into engagement with the slot in the bolt, and releasable means for positively holding the latch in engagement with the bolt.

3. The combination with a door lock bolt having a transverse slot formed therein, of a pivotally mounted latch arm having a hooked end adapted to engage said slot when the bolt is in locking position, resilient means for normally holding said latch arm out of engagement with the bolt, magnetically actuated means for moving said latch into engagement with the slot in the bolt, automatic means for engaging and holding said latch in engagement with the bolt, and magnetically actuated means for moving said automatic means out of engagement with the latch.

4. The combination with a door lock bolt having a transverse slot formed therein, of a pivotally mounted latch arm having a

hooked end adapted to engage the slot when the bolt is in door locking position, a spring for resiliently holding said latch in its inoperative position, an electromagnet adapted on the momentary energization thereof to move the latch into engagement with the slot in the bolt, a pivotally mounted spring pressed arm having a shoulder formed thereon for engagement with the latch to hold the same in its bolt engaging position, and an electromagnet adapted on the momentary energization thereof to move the spring pressed arm out from engagement with the latch.

5. The combination with a door lock bolt having a vertical slot formed in one of its vertical faces, of a pivotally mounted latch arm having a hook end adapted to engage said slot when the bolt is in door locking position, resilient means for normally holding the latch arm out of engagement with the bolt, magnetically actuated means for moving said latch arm into engagement with the bolt, and releasable means for holding the latch in engagement with the slot in the bolt.

6. The combination with a door lock bolt having a transverse slot formed in a vertical face thereof, the slotted vertical face of the bolt from the edge of the slot to its end being beveled, a pivotally mounted latch arm having a hook end adapted for engagement with the slot when the bolt is in door locking position, magnetically actuated means for moving said latch into engagement with the slot in the bolt, and means for resiliently holding the latch in engagement with the slot in the bolt.

7. The combination with a door lock bolt having a transverse slot formed in a vertical face thereof, the slotted vertical face of the bolt from the edge of the slot to its end being beveled, a pivotally mounted latch arm having a hook end adapted for engagement with the slot when the bolt is in door locking position, magnetically actuated means for moving said latch into engagement with the slot in the bolt, means for resiliently holding the latch in engagement with the slot in the bolt and magnetically actuated means for releasing said latch holding means.

8. The combination with a door lock bolt having a transverse slot formed therein, of a pivotally mounted normally inoperative latch arm, having a hooked end adapted to engage said slot when the bolt is in door locking position, magnetically actuated means for moving said latch into engagement with the slot in the bolt, releasable means for holding the latch in engagement with the bolt, resilient means for extending the bolt into door locking position, and a bolt engaging stop associated with the latch-

ing mechanism to insure registry of the latch with the slot.

5 9. The combination with a door lock bolt having a shoulder formed in a vertical face thereof, of a pivotally mounted normally in-  
operative latch arm having a projection adapted to engage said shoulder when the bolt is in door locking position and hold the  
10 same from movement, magnetically actuated means for moving said latch into engage-

ment with the shoulder on the bolt, and releasable means for positively holding the latch in engagement with the bolt.

In testimony whereof I hereunto set my hand in the presence of two subscribing  
witnesses. 15

GORDEN G. BERG.

In the presence of—  
STANLEY W. COOK,  
MARY F. ALLEN.