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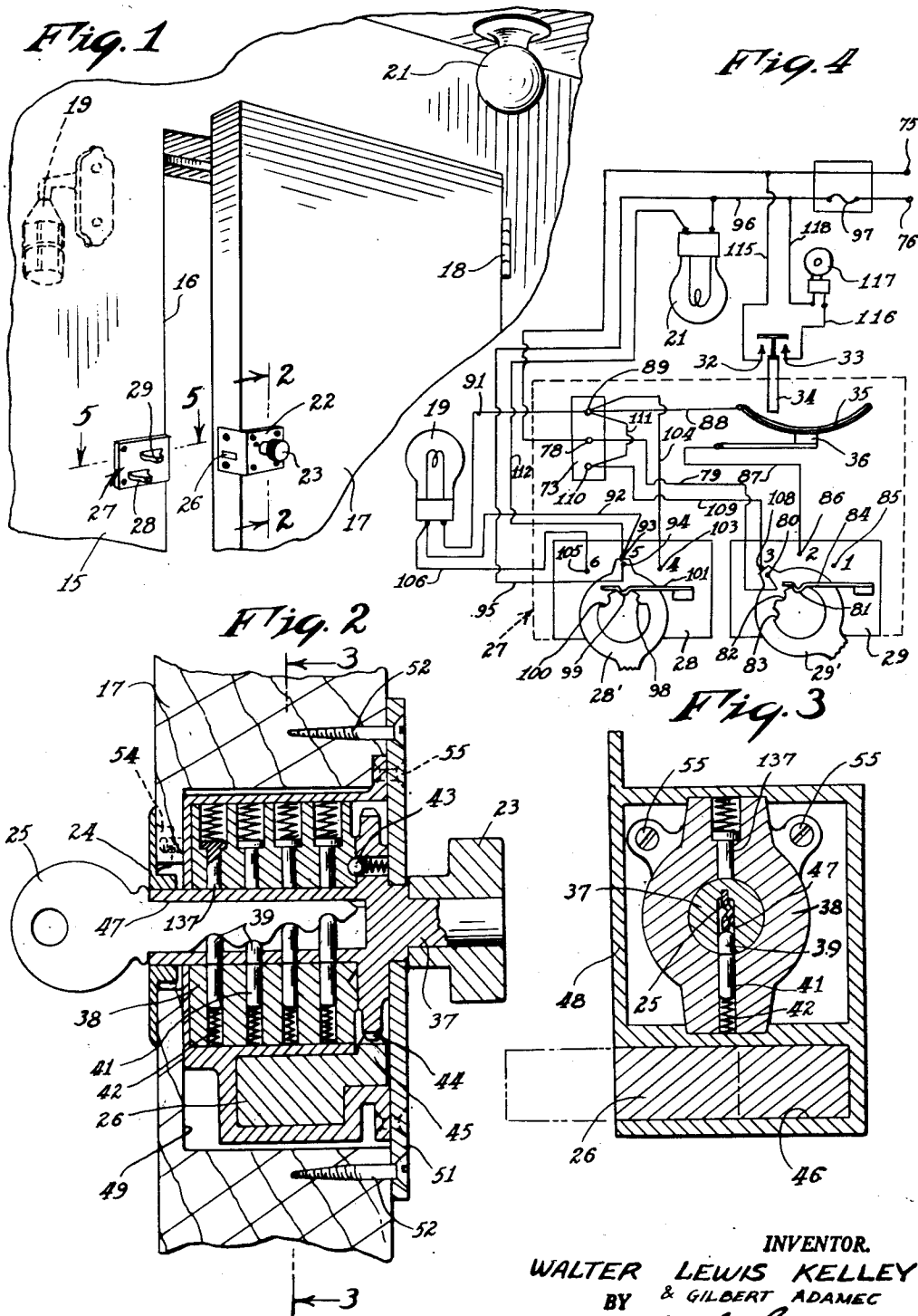
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2,637,801

DOOR LOCK AND LIGHT CONTROL SWITCH ARRANGEMENT

Filed June 12, 1952

3 Sheets-Sheet 1



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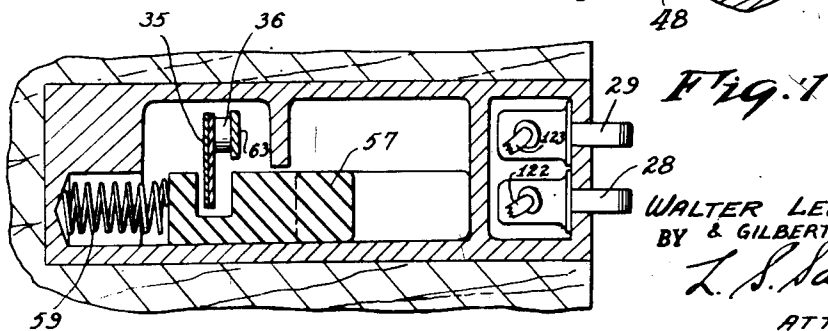
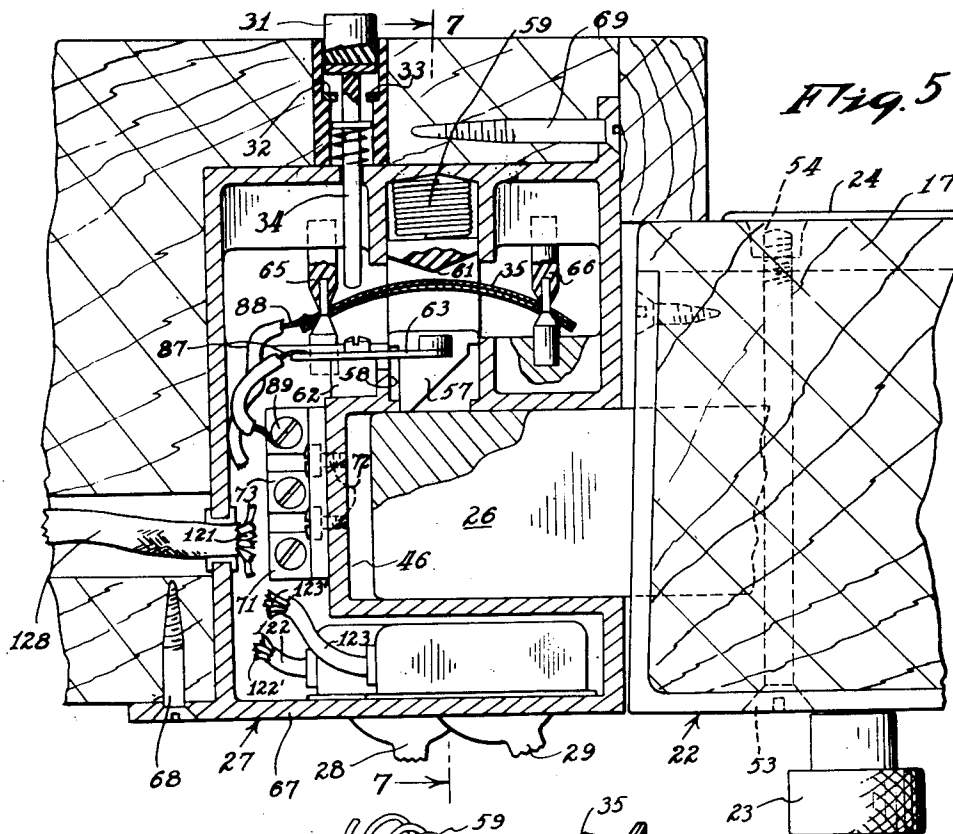
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DOOR LOCK AND LIGHT CONTROL SWITCH ARRANGEMENT

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3 Sheets-Sheet 2



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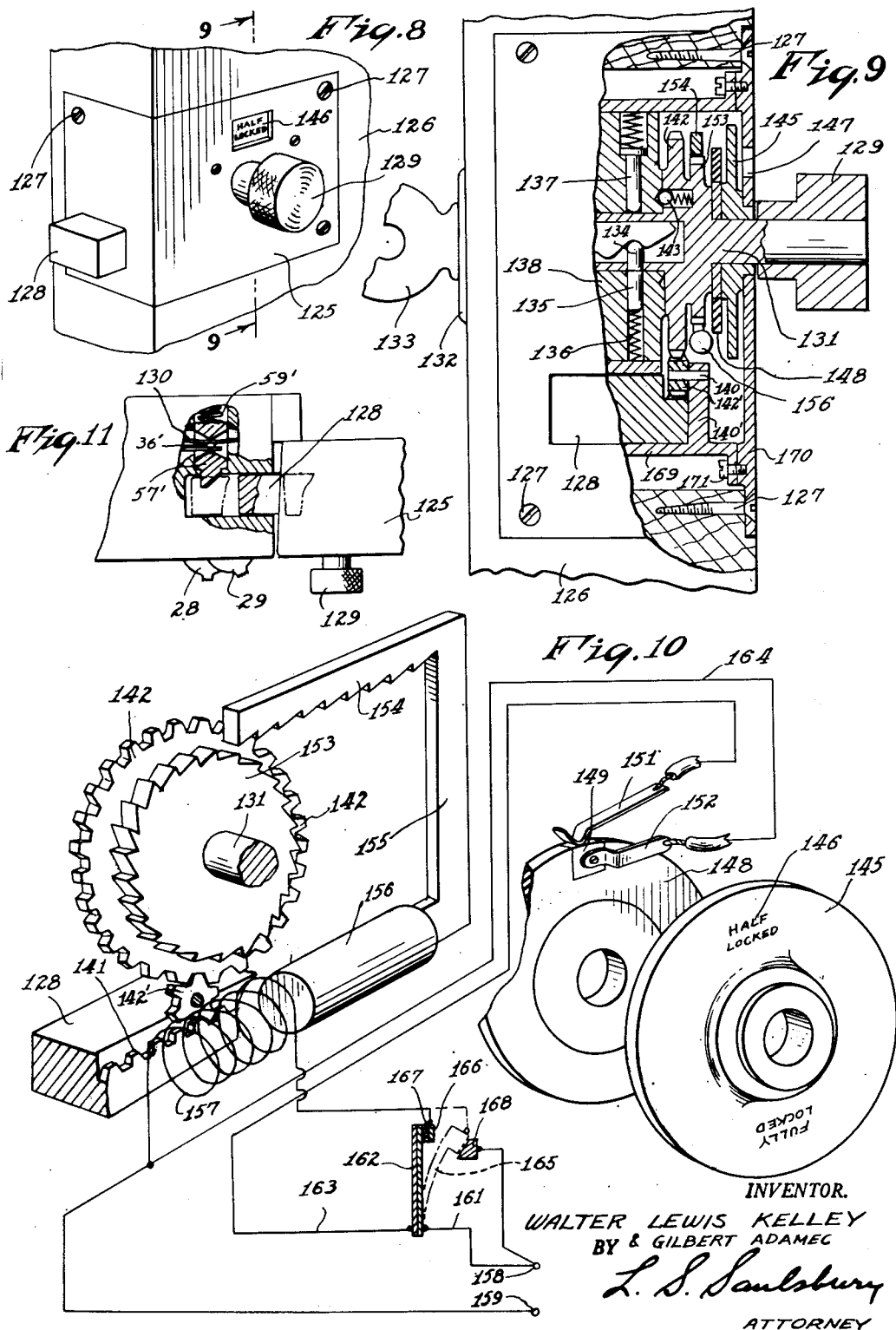
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DOOR LOCK AND LIGHT CONTROL SWITCH ARRANGEMENT

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3 Sheets-Sheet 3



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DOOR LOCK AND LIGHT CONTROL SWITCH
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9 Claims. (Cl. 240—2)

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This invention relates to a door lock and light control switch arrangement.

It is an object of the present invention to provide a door lock and light control switch arrangement wherein upon the ringing of the door bell or upon unlocking the door, a porch light and a vestibule light will be automatically turned on.

It is another object of the invention to provide a door lock and light control switch arrangement which has a thermal delay contact to automatically turn off the lights after the door has been opened and returned to the closed position, and to give the person time to remove his coat and hat and depart from the vestibule or, if upon leaving the household, to give the person time to depart from the porch.

Other objects of the invention are to provide a door lock and light switch control arrangement bearing the above objects in mind, which is of simple construction, inexpensive to manufacture, easy to install on the door and connected with the lights, compact and affords a unitary structure, easy to operate and efficient in use.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a perspective view of a door and its opening with the lock device and light control switch arrangement provided thereon, the lights which are controlled by the switch being shown respectively on the outer and inner sides of the door opening wall;

Fig. 2 is an enlarged vertical sectional view of the lock on the door as given on line 2—2 of Fig. 1;

Fig. 3 is an enlarged sectional view of the lock as viewed on line 3—3 of Fig. 2;

Fig. 4 is a wiring diagram of the control switch device on the side of the opening and of the lamps and bell ringing control;

Fig. 5 is an enlarged longitudinal sectional view of the control switch device as viewed on line 5—5 of Fig. 1;

Fig. 6 is a fragmentary and perspective view of portions of the switch device and of the thermal element with the operating slide therefor;

Fig. 7 is a transverse sectional view of the switch control device as viewed on line 7—7 of Fig. 5;

Fig. 8 is a fragmentary perspective view of a door edge with a lock control of a modified form of the invention fitted therein;

Fig. 9 is an enlarged fragmentary vertical sectional view of the lock latch shown in Fig. 8 and as viewed on line 9—9 thereof;

Fig. 10 is a perspective and skeleton view of

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parts of the lock shown in Fig. 8 and of the wiring used to effect its operation;

Fig. 11 is an illustrative view showing the different positions of the lock latch bolt according to the form of the invention shown in Fig. 8.

Referring now particularly to Figs. 1 to 7, 15 represents a building wall having a door opening 16 therein and a door 17 hinged as indicated at 18 to the side of the door opening 16 and adapted, when closed to fill the door opening 16. On the outer side of the building wall 15 is a porch lamp 19. On the inner side of the wall 15 and on the ceiling of the vestibule, is a light 21. On the door 17 is a lock device 22 having a knob 23 lying on the inner side of the door, a key hole plate 24 lying on the outer side of the door and adapted to receive a key 25. A latch bolt 26 is slidable out of the end of the lock device for co-operation with a switch control device 27 for the outside and inside lights 19 and 21. The switch control device has operating control handles 28 and 29 which can be operated as the person leaves the household whereby to select the lights which are to be used. Cooperating with the switch control device is a bell ringing, push button 31 adapted when pressed to bridge contacts 32 and 33 and through its extension 34 serving to throw a thermal control bimetallic element 35 to an over-center position on contact with the stationary contact 36 in the manner as shown in Fig. 4. Current will traverse the bimetallic element 35 and when it is sufficiently heated it will be returned to its out of contact position shown in Fig. 5.

The knob 23 of the lock device is fixed to an operating member 37 that is rotatable in an annular body member 38 and which carries short elements 39 that are depressible by the key 25 in order to release spring biased elements 41 from the operating member 37 and lying in the annular body 38. The elements 41 are urged toward the operating member 37 by springs 42. A ball detent 43 normally holds the operating member 37 in engagement with the annular body 38, but is releasable as the key 25 is turned so as to permit the operating member 37 to turn relative to the annular body 38 so that its gear teeth 44 acting upon a rack portion 45 of the latch bolt 26 whereby to retract the latch bolt 26 from an opening 46 in the switch control device 27. The operating member 37 has an elongated slot 47 for receiving the key 25. The body 38, the operating member 37 and the bolt 26 are all contained in the housing body 48. This housing body is disposed within an opening 49 cut in the door and is fixed therein by a plate 51 secured by screws 52 to the inner side of the door and to the plate 24 by long screw bolts 53 entering internally threaded boss projections 54 on the inner

side of plate 24. The plate 51 is secured to the housing body 48 by rivets 55.

An operating slide member 57 is slidable in an opening 58 lying transverse to the opening 46 of the latch bolt and is adapted to be pushed outwardly of the opening 46 by the latch bolt 26 and against the action of compression spring 59. Upon release of the latch bolt 26, the slide 57 is urged by the compression spring 59 into the opening 46 and pointed end portion 61 will engage the bimetallic element 35 to throw it over-center for engagement with the contact 36 and to close the circuit for the lamps 19 and 21 in a manner to be presently described.

The contact 36 is fixed to a block 62 by means of its spring bar arm 63 and a screw 64.

The outer ends of the bimetallic element 35 are supported on insulated posts 65 and 66 secured to the housing body and laterally spaced from each other to support the ends of the bimetallic element.

The several parts of the switch control device are carried in a casing 67 which is secured within an opening in the building wall 15 by screws 68 and 69 and so that the opening 46 thereof places the end of the latch bolt 26 of the lock device 22 when the door 16 is closed in order that the latch bolt 26 may enter the opening 46.

A terminal block 71 is secured to the inner side of the housing 67 by screws 72 and has screws 73 for the securement of wires having a common connection.

Referring now particularly to the wiring diagram shown in Fig. 4, the selector switch 29 has three positions including contacts. In the position "1" both lights 19 and 21 are kept off, and the device is left incapacitated. On movement of the operating member 29' to position "2," the lock bolt 26 will automatically operate upon the door being opened and the lock bolt released from the opening 46 in the switch control device whereby both lights will be automatically operated. With the operating member 29' in the position "3" as shown in Fig. 4, both lights will be kept on regardless of the position of the lock bolt. As operating member 29' of switch 29 is turned to position "4" only the ceiling lamp 21 is lighted when the lock bolt is released from the switch control device. With the operating element in the position "5," as shown in Fig. 5, both the ceiling light and the wall, or porch, light will be turned on as the lock bolt is released from the switch control device. With the member 29' in the position "6" the porch light only will light up.

The switch control device is connected to an electric source as indicated by terminals 75 and 76. The wire 77 leads from terminal 75 and is connected to a terminal 78 on terminal block 73. From this terminal 78 there extends a wire 79 which connects with a contact 80 on the operating member 29'. Operating member 29' has a series of notches 81, 82 and 83 which are engaged by a holding pawl 84 so as to retain the operating member 29 in its adjusted position. With the operating member 29' moved to the position "1" the switch control device will be made inoperative, as the contact 80 on the movable element 29' merely engages a dead contact 85. On the contact 80 of the operating member 29' engaging with contact 86 when in position "2" current may pass through wire 87 to contact 36. The lock bolt 26 will have been released, compression spring 59 and slide 57 will have moved the bimetallic element 35 over-center for contact with the contact terminal 36. This same result may

have happened by pressing the bell push button 31 and the engagement of extension 34 with the bimetallic element 35 in the manner illustrated in Fig. 5.

The current will then pass from contact 36 through bimetallic element 35 to heat the same, wire 88, terminal 89 on block 73, wire 91, electric lamp 19, wire 92, contact 93 of the selector switch 28, contact 94 of the electric switch operating arm 28', wire 95, ceiling lamp 21, supply wire 96, fuse 97 and electric source terminal 76. It will thus be seen that by means of this circuit and by the setting of the operating members 29' and 28' to positions "2" and "5" both lights are turned on automatically either as the door bell is pushed or the lock bolt of the door lock device is released from the opening 46 in the switch control device 27.

The operating member 28' has notches 98, 99 and 100 with which a pawl arm 101 cooperates. If the operating member 28' of the selector switch device 28 is turned to position "4," the pawl 101 will enter notch 100 and contact 94 will engage contact 103 so that current is taken from the terminal 99 of the terminal block 73 by wire 104 leading to contact 103. Since contact 94 engages contact 103 current will pass through wire 95 to lamp 21 in the ceiling so that only the ceiling lamp will be lighted.

If the operating member 28' is moved so that the pawl 101 enters notch 98 and to position "6," contact 94 will engage 105 so that current will pass through wire 106 connected between the lamp 19 and the contact 105. Current will thereby pass through the wire 95 directly to the wire 96, fuse 97 and electric source terminal 76. By moving the operating member 29' to position "3" both lights are turned on without regard to the position of the lock bolt. Current will leave electric source terminal 75, pass through wire 77, terminal 78 of terminal block 73, wire 79, contact 108, contact 99 on the operating member 29', wire 109, terminal 110 of terminal block 73, wire 111, terminal 89, wire 91, lamp 19, wire 92, wire 112, lamp 21, wire 96, fuse 97 and terminal 76. It will thus be seen that by moving the operating member 29' to position "3" that both lights are turned on while the door may still be closed and the bolt of the lock engaging the opening 46 of the switch control device 27. The bimetallic element 35 is no longer in the circuit when the operating member 29' is in position "3."

Referring particularly to Figs. 4 and 5, contact 32 of the push button device 31 will receive current when the contacts 32 and 33 are bridged by means of a wire 115 so that current will flow to contact 33, wire 116, bell buzzer 117, wire 118 to wire 96, fuse 97 and terminal 76.

A cable 118 has wires 121 which extend to the parts within the switch control device 27 and also extend through the building wall to the lamp devices 19 and 21 and the electric source. Other cables 122 and 123 lead respective from switches 29.

These cables 122 and 123 have respectively wires indicated generally at 122' and 123', Fig. 5, and are the several wires that connect with the respective switches in the manner shown in Fig. 4.

Referring now particularly to the form of the invention shown in Figs. 8 to 11, according to this form of the invention the lock device indicated generally at 125 is fixed to a door 126 in the manner shown in Fig. 8 and is made secure thereto by screws 127. A bolt 128 is slidable

from the lock device 125. The handle knob 129 is accessible from the other side of the door so as to rotate operating member 131. On the other side of the door there is a plate 132 having a key opening for key 133 which will engage with small slide elements 134 in the manner above described. The elements 134 serve to depress the elements 135 against the action of their springs 136 so as to free the operating member 131 and in order that it can be turned by its knob 129.

Slide members 137 opposing the slides 135 are similarly arranged in annular body member 138 to permit the key removal after a half turn of the operating member 131 by the key 133. The bolt 128 has a rack formation 141 that is engaged by a large gear 142. This large gear has a ball detent 143 serving to normally hold the operating member 131 against turning movement relative to the annular member 138.

This lock device 125 through its bolt 128 cooperates with the switch control device above described. Fixed to the operating member 131 is a disc 145 having an indication 146 thereon which can be observed through a window 147. If it is desired to maintain the lights in an "on" position after the door is unlocked, the knob 129 is so turned that the "half locked" indication appears in the window 147.

The latch bolt 128 will assume the position shown in Fig. 11 and slide 57' will be lowered under the action of spring 59' to bring spring contact 130 into contact with the contact element 36'. The lights will remain on. While the bowed contact element is shown in the downwardly bowed position and in contact with the contact element 36', it will be understood that when the latch 128 is moved under the slide 57' that the load contact spring 130 will be elevated to assume an upwardly bowed position. The upward movement of the slide will be against the action of the coil spring 59'.

The operating member 131 has an insulated disc 148 with a metal conductor insert in the periphery thereof, as indicated at 149, Fig. 10. Two spring contact fingers 151 and 152 may engage this insert 149 when the operating member is in the "half locked" position.

On the operating member 131 is a ratchet gear 153 which is operated by a pawl arm 154 on a U-shaped member 155. On the lower leg of the member 155 and running parallel with the ratchet portion 154, is a magnetic core 156. A solenoid coil 157 is provided for receiving the core 156 and when energized the core will be drawn toward the coil and the ratchet pawl arm 154 will rotate the ratchet gear 153 and turn the operating member 131 so that the bolt 128 by the action of the gear 142, idler gear 142', will cause gear rack teeth 141 and the bolt 128 to be moved. The bolt 128 will be moved to its "fully locked" position. The idler gear 142' is journaled on a pin 140 that is supported on an upwardly extending portion 140' of the casing.

Electric source terminals 158 and 159 supply current to the coil 157 when the contact fingers 151 and 152 bridge the insert 149 on the insulated disc 148.

When the fingers 151 and 152 carry current, current will pass from terminal 158 by wire 161 to thermal element 162 which is formed of two metal parts in the usual manner, wire 163, finger 151, insert 149 on the insulating plate 148, finger 152, wire 164 and terminal 159. At this time, the bolt 128 is in the "half locked" position as shown in Fig. 11, the bimetallic ele-

ment 162 will start to be heated by the current passing through the same and after a time the bimetallic element 162 will bend to assume the dotted line position indicated at 165. A contact 166 which is insulated by an insulating member 167 from the bimetallic parts will be carried to a contact 168 so that immediately coil 157 will be energized and the core 156 will be pulled through the coil 157 and the ratchet portion 154 will have acted upon ratchet plate 153 to turn operating member 131 and the bolt 128 to its fully locked position.

The bolt 128 will elevate the slide 57' to cause the bowed contact 130 to be lifted from contact 36'. The light circuit which is controlled by the switch control device 27 will thereby be broken.

All of the parts of the lock device shown in Figs. 8 to 11 are contained in a housing 169 which is attached to a plate 170 by screws 171. The plate 170 is in turn secured to the door by long wood screws 127.

It should now be apparent that there has been provided a combined door lock and light control switch arrangement whereby upon the turning of the lock, either the porch light or the ceiling light in the vestibule or both can be turned on and after a predetermined time the lights will be turned off automatically by thermostatic or bimetallic means. It will also be apparent that by the mere ringing of the bell a light will be turned on and that this same light after a predetermined time will be automatically extinguished.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. A combined door lock and light control switch arrangement comprising a door lock having an operating member and a latch bolt adapted to be operated by the operating member, said door lock device adapted to be mounted in the edge of the door, a light control switch device comprising means for receiving the latch bolt of the door lock device, a selector switch adjustable to effect the lighting of either one or the other of two lights or both lights, other switch means connected with the selector switch and responsive to the operation of the latch bolt of the lock device within the switch control device and serving to turn on and off the lights.

2. A combined door lock and light control switch arrangement adapted to control lights adjacent the door comprising a door lock device having an operating member and a latch bolt operated thereby, a switch control device comprising selector switch means adapted to effect the turning on of either one light or the other or both lights according to the position that the switch means has been set and other switch means connected to other switch means and responsive to the operation of the latch bolt to turn on the light or lights, said other switch means including a thermo element operable after a predetermined time interval to interrupt the light or lights.

3. A combined door lock and light control switch arrangement comprising a door lock having an operating member and a latch bolt adapted to be operated by the operating member, said door lock device adapted to be mounted in the edge of the door, a light control switch device

comprising means for receiving the latch bolt of the door lock device, a selector switch adjustable to effect the lighting of either one or the other of two lights or both lights, other switch means connected with the selector switch and responsive to the operation of the latch bolt of the lock device within the switch control device and serving to turn on and off the lights, and another switch means associated with said selector switch device and with said latch bolt responsive switch means operable to capacitate or incapacitate the switch control device or to render it effective for automatic operation.

4. A combined door lock and light control switch arrangement comprising a door lock having an operating member and a latch bolt adapted to be operated by the operating member, said door lock device adapted to be mounted in the edge of the door, a light control switch device comprising means for receiving the latch bolt of the door lock device, a selector switch adjustable to effect the lighting of either one or the other of two lights or both lights, other switch means connected with the selector switch and responsive to the operation of the latch bolt of the lock device within the switch control device and serving to turn on and off the lights, and a bell ringing switch device associated with said other switch means responsive to the operation of the latch bolt whereby to effect the actuation of said other switch means independently of the latch bolt, whereby the lights can be turned on either by the bell ringing switch device or by the latch bolt switch means.

5. A door lock and light control switch arrangement adapted to control lights adjacent a door opening comprising a selector switch means serving to select one light or the other light or both lights, a door lock device having an operating member and a latch bolt adapted to be operated by the operating member, said control switch further having a manually operable switch serving to turn on or off the lights or to set the lights for any automatic operation, and other switch means associated with said selector and manually operated switch and responsive to the actuation of said lock bolt to turn on said light or lights, said latch bolt responsive to switch means including a thermal element operable at a predetermined interval to turn off said light or lights.

6. A combined door lock and light control switch arrangement as defined in claim 5 and door bell switch means operable on said thermal element of said other switch means to actuate the same independently of the latch bolt whereby said light or lights may be turned on by the bell ringing device and independently of the latch bolt.

7. A door lock and light control switch arrangement adapted for use with lights near door openings comprising a lock device having an operating member and a latch bolt operated by the same, a light switch control device comprising a casing having an opening adapted to receive the latch bolt of the lock device, opening extending laterally from said latch bolt opening, a slide in said laterally extending opening having a portion adapted to project into the latch bolt opening upon the withdrawal of the latch bolt, compression spring means for operating said slide and urging the same toward the latch bolt opening, a thermal element extending transversely through said slide, said slide having an opening for accommodating said thermal

element, a switch contact, said slide being operable upon said thermal element to cause the same to engage said switch contact as the latch bolt is withdrawn from the latch bolt opening, and electric circuit means connected with said thermal element and said contact and adapted for connection with said lights, whereby upon release of said latch bolt the thermal element will be engaged with said contact and after a predetermined time will break away from said contact to interrupt the light circuit.

8. A door lock and light control switch arrangement adapted for use with lights near door openings comprising a lock device having an operating member and a latch bolt operated by the same, a light switch control device comprising a casing having an opening adapted to receive the latch bolt of the lock device, opening extending laterally from said latch bolt opening, a slide in said laterally extending opening having a portion adapted to project into the latch bolt opening upon the withdrawal of the latch bolt, compression spring means for operating said slide and urging the same toward the latch bolt opening, a thermal element extending transversely through said slide, said slide having an opening for accommodating said thermal element, a switch contact, said slide being operable upon said thermal element to cause the same to engage said switch contact as the latch bolt is withdrawn from the latch bolt opening, and electric current means connected with said thermal element and said contact and adapted for connection with said lights, whereby upon release of said latch bolt the thermal element will be engaged with said contact and after a predetermined time will break away from said contact to interrupt the light circuit, and a push button bell ringing switch associated with said casing and having an extension projection therethrough adapted as it is pressed to engage said thermal element to cause the same to be flexed and to engage with said contact whereby the light circuit may be closed either by the bell ringing button or by said spring operated slide and the release of said bolt latch.

9. A door lock and light control switch arrangement adapted to turn off and on lights adjacent a door opening comprising a door lock device having an operating member and a latch bolt operated thereby, said operating member having a hand knob by which the operating member can be turned manually and indicating means for indicating the position of said operating member, whereby said operating member can be set to a "half locked" position, and thermal-electric means having a thermal element, a solenoid, contact elements adapted to be bridged by adjustment of the operating member and a slide member operable by said solenoid and engageable with said operating member to turn the same independently through the knob to force the latch bolt to a fully locked position and responsive to the actuation of the thermal element, and a light control switch device having an opening for receiving said latch bolt and switch means operable upon the release of said latch bolt to turn on said lights and upon actuation of the latch bolt by the thermo-electric means to turn off said lights.

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