

No. 759,814.

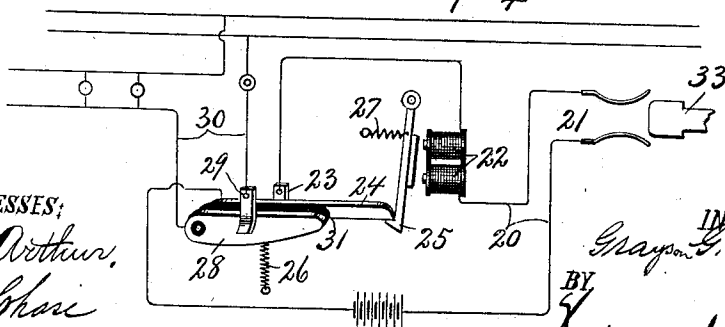
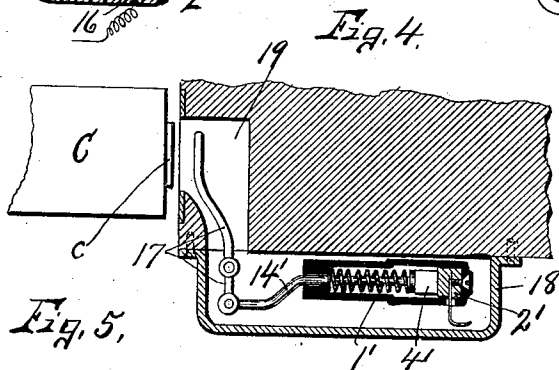
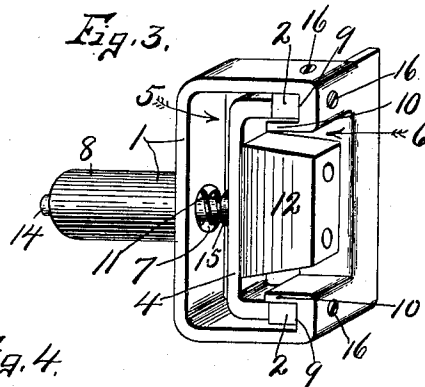
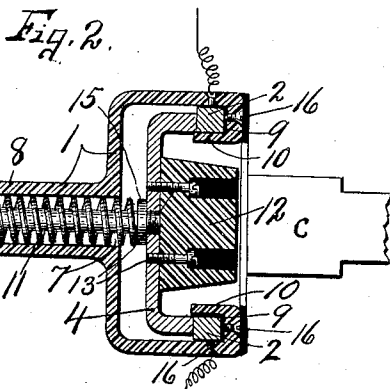
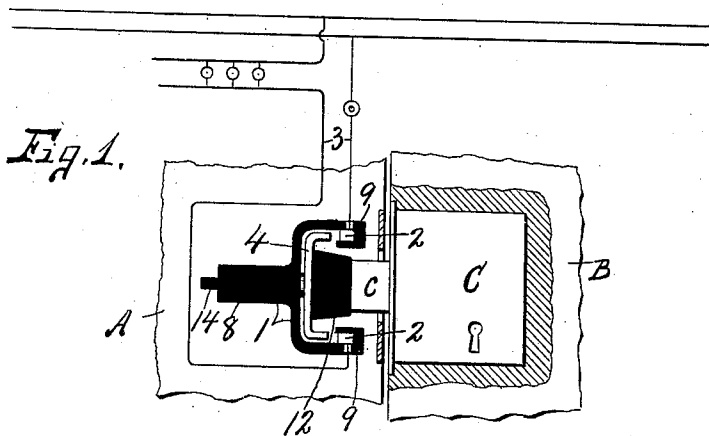
PATENTED MAY 10, 1904.

G. G. KNAPP.

DOOR LOCK ACTUATED CIRCUIT BREAKER.

APPLICATION FILED FEB. 13, 1903.

NO MODEL.



WITNESSES:

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DOOR-LOCK-ACTUATED CIRCUIT-BREAKER.

SPECIFICATION forming part of Letters Patent No. 759,814, dated May 10, 1904.

Application filed February 13, 1903. Serial No. 143,172. (No model.)

To all whom it may concern:

Be it known that I, GRAYSON GUTHRIE KNAPP, of Auburn, in the county of Cayuga, in the State of New York, have invented new and useful Improvements in Door-Lock-Actuated Circuit-Breakers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in bolt-actuated circuit-breakers, and is particularly applicable for use in connection with the locking-bolts of doors in hotels and similar public institutions, whereby the electric-lighting circuit is broken in the act of locking the door when the occupant leaves the room and neglects to break the circuit through the medium of the regular switch provided therefor.

The primary object of these improvements is to reduce the liability of accidental short circuits to a minimum and also to prevent the occurrence of arcs between the terminals, which might tend to destroy the efficient working of the device.

Another object is to obviate any liability of shunting any portion of the circuit to the locking-bolt or any other part of the lock with which the occupant of the room may come in contact.

Further objects will appear in the subsequent description.

Referring to the drawings, Figure 1 is an elevation of my improved circuit-breaker and a door-lock, the electric-lighting circuit being shown diagrammatically and the locking-bolt being shown in its elevated position as operating the circuit-breaker to break the lighting-circuit. Fig. 2 is an enlarged sectional view of the device seen in Fig. 1, the bolt being in its unlocked position and the contact-bar electrically connecting the terminals of the lighting-circuit to close said circuit. Fig. 3 is a perspective view of my invention. Fig. 4 is a horizontal sectional view of a slightly-modified form of my invention, in which an intermediary lever is employed to transmit motion from the locking-bolt to the contact-bar. Fig. 5 is a diagrammatic view of a further modified means for break-

ing the lighting-circuit through the medium of the locking-bolt.

Similar reference characters indicate corresponding parts in all the views.

In the drawings Figs. 1, 2, and 3 I have shown the preferred form of my invention, which consists of a frame 1, of insulating material, in which is partially embedded separated terminals 2 of an electric-lighting circuit 3. These terminals are normally connected by a sliding contact-bar 4, of electric conducting material, so that the lighting-circuit is normally closed through the terminals and bar. The frame 2 is constructed in the form of a rectangular box or casing, with one side and a portion of one of its end walls removed for forming, respectively, an interior chamber 5 and an end opening 6. The vertical wall of this frame opposite the end opening 6 is provided with an aperture 7, which is surrounded by an inwardly-projecting hollow boss 8, of insulating material, and preferably forming a part of the frame 1. This frame 1 is adapted to be concealed within the casing A of a door B, so that the opening 6 will register with the locking-bolt *c* of a door-lock C. The terminals 2 are formed of electric conducting material, as brass or equivalent metal, and are embedded in recesses 9 in the frame 1, above and beneath the opening 6, being partially incased by the frame 1, which frame is provided with inturned flanges 10, forming the upper and lower end walls of the opening 6 and lapping upon the adjacent faces of the terminals to prevent any possibility of short circuits between the terminals, particularly when the locking-bolt is in its locked position and within the opening 6. By thus insulating the adjacent faces of the terminals 2 there is less liability of the electric current being shunted or short-circuited through the lock-frame, and therefore prevents any possibility of shock to the operator in the manipulation of the key. The inner faces of the terminals are bare and are adapted to be contacted by the bar 4 for electrically connecting said terminals and closing the light-circuit 3.

The bar 4 is formed of electric conducting material, such as brass or equivalent metal, and

is reciprocally movable in the opening 5 into and out of contact with the terminals 2 by means of the locking-bolt *c* and a spring 11. It is evident, therefore, that this bar extends 5 above and beneath the upper and lower walls of the opening 6, and in order to prevent direct contact of the locking-bolt with the bar I provide an abutment 12, of insulating material, which is secured to the outer face of 10 said bar by means of the clamping-screws 13 and projects into the opening 6 in the path of movement of the locking-bolt *c*.

Centrally secured to the bar 4 and projecting inwardly therefrom is a stem 14, of insulating material, which extends through the 15 boss 8, and its outer end is guided in a bearing 8', which in this instance consists of a bushing of insulating material secured within the inner end of the boss 8.

The spring 11 surrounds the stem 14 within 20 the boss 8, one end of said spring abutting against a collar 15 of the insulating material adjacent to the bar 4, and its other end abuts against the inner face of the bearing or bushing 8', said spring serving to force and to hold 25 the bar 4 into contact with the terminals 2 for normally maintaining a closed circuit when the locking-bolt is withdrawn.

Although the terminals 2 are embedded in 30 the recess 9 of the frame 1, they are additionally held in position by screws 16 and are adapted to receive the ends of the wires of the lighting-circuit 3, one of these screws serving to hold the wire in electric contact with 35 the terminals.

In the operation of the device just described, assuming that the occupant of the room in which the electric lights are located leaves the room and neglects to throw the switch to 40 break the lighting-circuit, then when the key is turned in the lock C to move the bolt *c* to its locking position said bolt engages with the outer face of the insulating-block 12, and thereby slides the bar 4 and parts connected 45 thereto inwardly out of contact with the terminals 2, thus breaking the lighting-circuit, in which position the bar is held until the door is again unlocked, whereupon the spring 11 automatically returns the bar 4 into normal position in contact with the terminals 2 50 and closes said circuit.

In Fig. 4 of the drawings I have shown a slightly-modified form of lock-actuated circuit-breaker, consisting of an insulating-frame 55 1', terminals 2' of the lighting-circuit, a contact-bar 4', electrically connecting the terminals and normally closing the circuit, said contact-bar being provided with a stem 14', of insulating material, which in turn is connected to one arm of a lever 17. This device is 60 mounted in an inclosing case 18, which is adapted to be secured to the exposed face of the door-casing, said casing being provided

with an opening 18, through which the other 65 arm of the lever 17 projects and is disposed in the path of the locking-bolt *c* of the lock C, so that when the locking-bolt is moved to its locking position the lever 17 is rocked inwardly and operates to draw the bar 4' out of contact with the terminals 2', thus break- 70 ing the lighting-circuit, the essential feature of difference between this construction and the preferred form shown in Figs. 1 to 3, inclusive, consisting in the interposition of the lever 17 between the locking-bolt and stem of 75 the bar 4'. In other words, in the first instance the contact-bar is pushed out of engagement with the terminals, and in the second instance it is pulled out of contact with the terminals. 80

In Fig. 5 I have shown diagrammatically a further modified means of breaking the circuit, consisting of a battery-circuit 20, which includes therein a pair of terminals 21, an electro- 85 magnet 22, and a second pair of terminals 23 and 24, the terminal 24 being pivoted at one end and is movable into and out of contact with the terminal 23 for making and breaking the battery-circuit. These terminals 23 and 24 are normally held in contact with each other by 90 a pawl 25, which is provided with an armature 26 in proximity to the magnets 22, whereby when the battery-circuit is closed through the magnets the pawl 25 is drawn out of holding engagement with the terminal 24, where- 95 upon said terminal 24 is drawn out of contact with the terminal 23 by means of a spring 26, thus breaking the battery-circuit, the pawl 25 being returned to its normal position by the spring 27 or equivalent means. Mounted upon 100 the same pivot with the terminal 24 is a second terminal 28, which is normally in contact with an additional terminal 29, the terminals 28 and 29 being connected in a lighting-circuit 30, and the terminal 28 is insulated from the 105 terminal 24 by an insulating-strip 31. The terminals 21 are normally separated, and therefore the battery-circuit is broken while the lighting-circuit is closed. In this instance a locking-bolt 33 is movable into contact with 110 the terminals 21 when the bolt is in its locking position, which operation closes the battery-circuit, and thus energizes the magnets 22 to trip the pawl 25 and release the terminals 24 and 28, and the spring 26 then oper- 115 ates to draw both terminals 24 and 28 out of contact with their respective terminals 23 and 29, thus not only breaking the battery-circuit, but also breaking the electric-lighting circuit 30, and when the occupant of the room 120 unlocks the bolt 33 and enters his room it is simply necessary to return the terminals 24 and 28 to their normal positions into holding engagement with the pawl 25 in order to re-establish the lighting-circuit. 125

Having thus described my invention, what

I claim, and desire to secure by Letters Patent, is—

1. In combination with the sliding bolt of a door-lock, a casing having its front end open
5 and having an aperture in its rear end, with a hollow boss connected to the casing in line with said aperture, inturned flanges formed on said front end of the casing with contacts engaging between the same and the adjacent
10 walls of the casing, a sliding contact-bar for engagement with said contacts, a stem on said bar operating through said boss, with a spring surrounding said stem, an insulating-block secured to said sliding contact and adapted for
15 engagement with the door-bolt, said terminals being in circuit.

2. In combination with the sliding bolt of a door-lock, a casing having a U-shaped spring-pressed sliding contact mounted therein, ter-

minals in the casing for engagement with the
20 arms of the sliding contact said terminals being in circuit, an insulating-block mounted on said contact, and adapted for engagement with the bolt.

3. In combination with the bolt of a door-
25 lock, a casing, a spring-actuated stem therein, with a contact connected to said stem, said contact carrying an insulating-block intermediate its ends, and arms on said contact of less length than said block, and terminals in the casing in
30 circuit and for engagement with the arms.

In witness whereof I have hereunto set my hand this 9th day of February, 1903.

GRAYSON GUTHRIE KNAPP.

Witnesses:

G. P. LONGSTREET,
RALPH R. KEELER.