

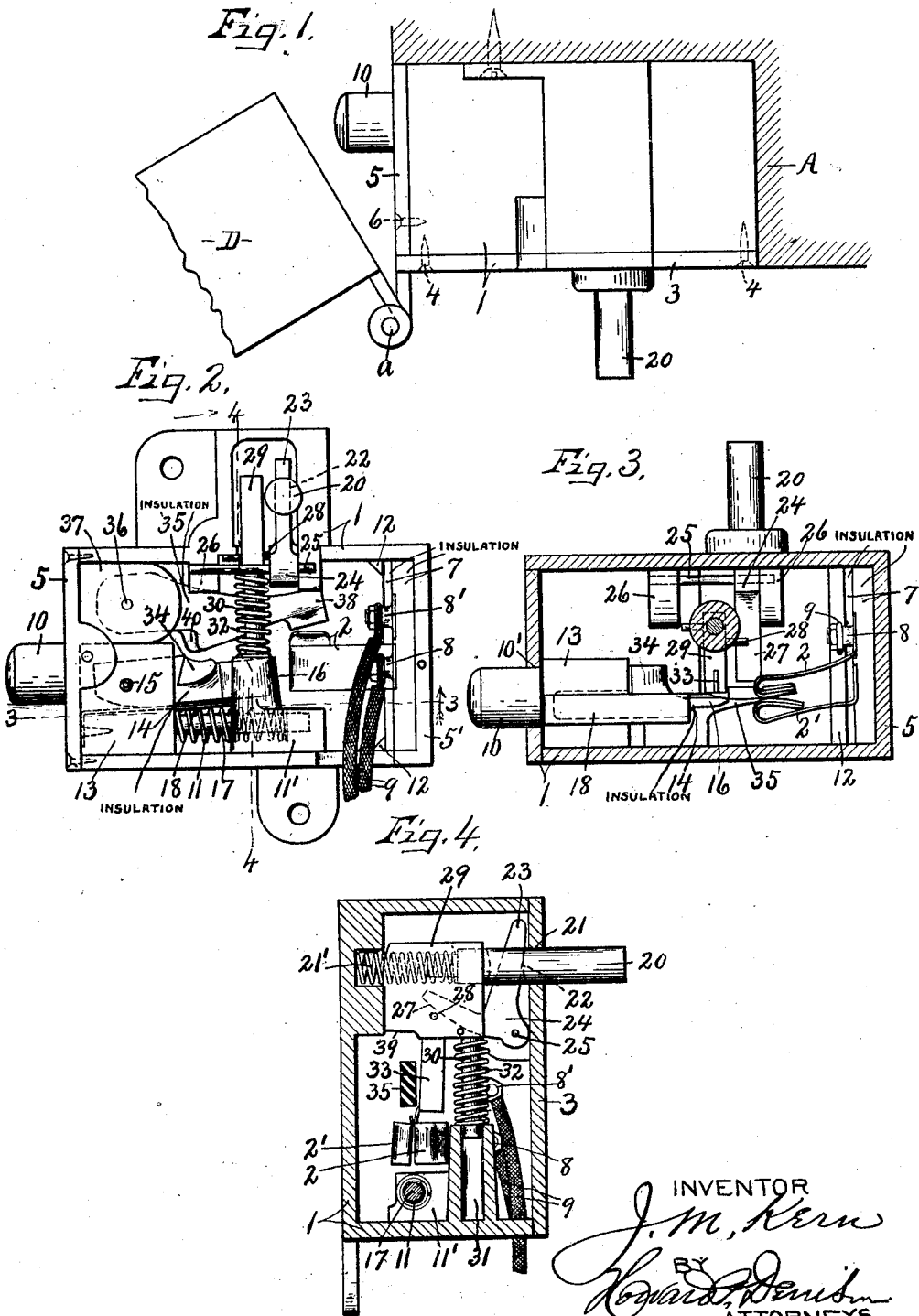
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DOOR CONTROLLED ELECTRIC LIGHTING SWITCH

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DOOR-CONTROLLED ELECTRIC-LIGHTING SWITCH.

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This invention relates to a door controlled electric-lighting switch adapted to be used more particularly in connection with cellar, bathroom, attic and other doors leading to unfrequented rooms where electric lights are usually installed. These doors are usually closed and it frequently happens that where the switch is independent of the door, the light in the room to which the door leads is frequently left burning through inadvertence of the user after leaving the room resulting in considerable waste of electric current, and the main object of my present invention is to avoid this waste by making the operation of the switch to open the lighting circuit leading to such room dependent upon the closing of the door, which is less liable to be forgotten by the user than the turning out of the light.

Another object is to provide the same switch box with means operable at will by the occupant of the room for displacing the door operated switch opening means when the door is closed and thereby permitting the switch to close to energize the lamp or lamps in such room and also to permit the last named means to be used for operating another switch opening device so that the light may be turned out even though the door may be open.

Other objects and uses relating to specific parts of the device will be brought out in the following description:

In the drawings:

Figure 1 is a top plan of one form of my door-controlled lighting-switch incorporated in the door casing shown in section and also showing a portion of a door for controlling the operation of the switch.

Figure 2 is an inner face view of the switch-box and mechanism therein with the inner cover plate removed.

Figure 3 is a longitudinal sectional view taken in the plane of line 3—3, Figure 2 looking toward the top of the switch-box.

Figure 4 is a transverse vertical sectional view taken in the plane of line 4—4, Figure 2.

As illustrated, this device comprises a switch-box —1— adapted to be installed in the door casing as —A— for receiving and supporting a pair of switch terminals —2— and —2'— of an electric lighting circuit in which is connected one or more electric lamps adapted to be placed in the room to which the door as —D— leads, said door be-

ing connected by hinge —a— to the door casing —A— for controlling the opening and closing of the switch terminals —2— and —2'— in a manner hereinafter described.

The switch-box —1— is provided with a removable inner cover plate —3— held in place by screws —4— or equivalent fastening means, the switch-box being also provided with a removable end plate —5—, which is also held in place by screws —6—.

The switch terminals —2— and —2'— are mounted upon an insulating block —7— and are electrically connected to binding posts —8— and —8'— which are secured to the block and form continuations of the terminals —2— and —2'— but are insulated from each other by spacing them apart on said block, while the terminals —2— and —2'— are normally spring pressed into electrical contact with each other as shown more clearly in Figure 3, thereby closing the circuit through suitable wires —9— leading to the electric light or lights in the cellar, bathroom, attic or other room where the light is to be controlled by the door.

The end plate —5— of the switch-box is provided with a guide opening —10'— for receiving a push-rod —10—, which normally projects outwardly through and some distance beyond said wall to be engaged and forced inwardly against the action of a compression spring —11— by the closing of the door —D—, said spring serving to return the push rod when the door is open.

The block —7— carrying the spring terminals —2— and —2'— and binding posts —8— and —8'— is inserted between one of the end walls as —5'— and guide ribs —12— at the end of the switch-box opposite the removable end wall —5— and push-rod —10— and may be removed for adjustment or repairs of the terminals when the cover plate —3— is removed.

The terminals —2— and —2'— extend inwardly from the block —7— toward the push rod —10— and their free ends, which normally contact with each other under the spring tension of the terminals, are adapted to be separated to open the switch by a suitable device carried by the push rod —10— when the latter is forced inwardly by the closing of the door —D—.

For this purpose, the inner end of the push rod is provided with an enlargement or head —13— carrying a pawl —14— of insulating material which is pivoted at —15—

to said head and has its inner end —16— wedge-shaped and normally alined with the meeting faces of the terminals —2— and —2'— so that when the push rod is forced inwardly against the action of the spring —11—, its wedge-shaped inner end —16— will be forced between the adjacent faces of the terminals to separate them and thereby to open the switch and de-energize the lighting circuit.

The spring —11— for the push rod —10— is interposed between the inner face of the head —13— and a stationary block —11'— on the lower side of the switch-box, said block being provided with a socket for receiving the inner end of a stem —17— on said head and around which the spring —11— is coiled, the socket serving as a guide for the inner end of the push rod —10—.

It, therefore, follows that when the door is closed, the push rod —10— will be forced inwardly to open the switch terminals —2— and —2'— and that when the door is open, the push rod will be forced outwardly by the spring —11— to permit the terminals to close one against the other.

The object in pivoting the pawl —14— at —15— to the head —13— is to permit its free end to be forced from between the terminals —2— and —2'— in a manner hereinafter described when the door is closed and thereby to allow the terminals to close one against the other for energizing the lighting circuit in case the light should be required in the room when the door is closed, as for example, when the user is in the cellar or other room in which the light is located.

A flat retracting spring —18— is secured at one end to the end wall —5— of the switch-box and has its free end bearing against the lower edge of the pawl —14— to restore the latter to its normal position when the push rod —10— is released by the opening of the door.

Suitable means is provided whereby the opening and closing of the terminals —2— and —2'— may be controlled at the will of the operator independently of the door-operated push rod —10—, said means comprising a secondary push rod —20— which is reciprocally movable in a guide opening —21— in the front wall —3— of the switch-box at right angles to the direction of movement to the push rod —10—, said secondary push rod being movable inwardly against the action of a compression spring —21'— and is provided with a transverse slot —22— just inside of the front wall —3— for receiving one arm —23— of a bell crank lever —24— which is pivoted at —25— to a suitable boss —26— on the inside of the front wall —3— and has its other arm —27— adapted to engage a pin —28— on the adjacent side of a movable block —29—.

This block —29— is slidable transversely

of the direction of movement of the push rod —20— and is provided with a guide stem —30— movable in a socket —31— on the lower wall of the switch-box.

A coil spring —32— surrounds the intermediate portion of the stem —30— between the sliding block —29— and lower wall of the switch box for yieldingly holding the sliding block in its normal position.

This block —29— is provided with a downwardly projecting arm —33— which is adapted to engage a laterally projecting lug —34— on the pawl —14— for tripping said pawl from between the terminals —2— and —2'— when the push rod —10— is forced inwardly by the closing of the door and the secondary push rod —20— is forced inwardly to cause the bell crank lever —24— to operate the sliding block —29— and its arm —33— against the lug —34—.

That is, the arm —33— is disposed in the plane of movement of the lug —34— but is normally held out of the path of movement of said lug by the spring —32— but when the door is closed and the plunger —10— and lug —34— are moved inwardly to cause the pawl —14— to open the switch terminals —2— and —2'—, said lug will be brought directly under or in the path of movement of the arm —33— at which time, the lighting circuit will be de-energized and if the operator desires to energize said circuit while in the room in which the light is located, it is simply necessary to push the rod —20— inwardly against the action of its compression spring —21'— thereby causing the downward movement of the sliding arm —29— against the action of the spring —32— through the medium of the bell crank lever —24— by which operation, the arm —33— will engage the underlying lug —34— to force the pawl —14— from between the terminals —2— and —2'— and allow the latter to close one against the other for energizing the circuit, under which conditions, the pawl —14— will be forced against the lower edge of the terminals by the spring —18— but not between them.

Now, in case the door should be opened while the terminals are thus closed one against the other, the push rod —10— would be returned to its normal position by the retracting spring —11— while the pawl —14— will also be returned to its normal position in alinement with the terminals by the flat spring —18— leaving the terminals still closed.

Suitable means is provided whereby the terminals may be separated to break the lighting circuit when the door is open, and for this purpose is provided an additional pawl —35— of insulating material pivoted at one end at —36— to a block —37— on the interior of the switch-box and having its other end provided with a blade —38—

registering with the meeting faces of the terminals —2— and —2'— at one side thereof for entrance between said terminals to separate the same and thereby to break the lighting circuit.

In order that the pawl —35— may be operated by the push rod —20—, the intermediate portion is disposed in the path of movement of a shoulder —39— on the inner edge of the sliding block —29— whereby when said block is operated by the inward movement of the plunger —20— through the medium of the bell crank lever —24—, the shoulder —39— will engage the upper edge of the pawl —35— to rock its free end downwardly upon its pivot —36— and thereby cause said free end to enter between and separate the terminals —2— and —2'— for breaking the lighting circuit independently of the door operated push rod —10—.

The pawl —35— is provided on its lower edge with a shoulder —40— adapted to project into the path of movement of the inner upper edge of the head —13— of the push rod —10— when the inner end of the pawl —35— is forced between the terminals —2— and —2'— and the push rod —20— is at its extreme outward movement and it, therefore, follows that if the door is closed to force the push rod —10— inwardly, the inner upper end of the head —13— will engage the shoulder —40— and thereby lift and hold the free end —38— of the pawl —35— out of engagement with the meeting faces of the terminals —2— and —2'—, while the same inward movement of the push rod —10— will cause the inner end —16— of the pawl —14— to enter between the terminals to break the lighting circuit. If it is desired to light the lamps while the door is closed and the operator is in the room to which the door leads, it is simply necessary to push the rod —20— inwardly, thereby causing the arm —33— on the sliding block —29— to displace the pawl —14— from between the terminals and allowing the latter to close for energizing the lighting circuit after which the blocks —29— may be returned by the spring —32— leaving the wedges —16— and —33— at opposite sides of the closed terminals.

The arm —33— is preferably made of spring metal so that in case the push rod —10— should be forced inwardly while the push rod —20— is at its innermost position, the shoulder —34— would simply engage and deflect the free end of said spring arm —33— against its own tension without liability of breaking or impairing any of the parts.

What I claim is:—

1. In a door-controlled electric light switch, a pair of spring-terminals normally tensioned to contact with each other for closing an electric lighting circuit, a push-rod

carrying a pivoted pawl and adapted to be operated by the closing of a door to force the pawl between the terminals and thereby to break the lighting circuit, a spring for operating the push rod and pawl to permit the closing of the terminals when the door is opened, an additional push rod operable at will transversely of the movement of the first-named push-rod, and means actuated by the second-named push rod for separating said terminals and thereby breaking the circuit when the pawl of the first-named push rod is withdrawn from between the terminals by the opening of the door.

2. In a door-controlled electric lighting switch, a pair of spring terminals of an electric lighting switch tensioned to normally contact one with the other, a push rod adapted to be operated in one direction by the closing of a door, a spring for returning the push rod, a pawl pivoted to the push rod and movable therewith between the terminals when the door is closed for separating said terminals and thereby breaking the lighting circuit, an additional push rod movable transversely of the movement of the first-named push rod, means actuated by the movement of the second-named push rod in one direction for displacing said pawl from between the terminals and thereby allowing the terminals to contact with each other for closing the lighting circuit when the door is closed and a spring for returning the pawl to its normal position when the first-named push rod is permitted to be returned by its spring when the door is opened.

3. In a door-controlled electric lighting switch, a pair of spring terminals of an electric lighting circuit normally tensioned with each other for closing said circuit, separate pivoted pawls each movable to and from a position between the terminals for separating the same and thereby breaking the lighting circuit, a door operated push rod for forcing one of said pawls between the terminals, means including a separate push rod operable at will for forcing the other pawl between the terminals when the door-operated pawl is returned and a spring for returning the door-operated push rod and pawl actuated thereby.

4. In a door-controlled electric lighting switch, normally closed self-closing contacts of an electric lighting circuit, a pivoted pawl movable to and from a position between the contacts for separating the same and thereby breaking the lighting circuit, means including a push rod operable at will for forcing said pawl between the contacts, a separate push rod operable in one direction by the closing of the door, means actuated by the second-named push rod when operated by the closing of the door for tripping the pawl from between the contacts and means

actuated by the second-named push rod when actuated by the closing of the door for separating said contacts.

5 In a door-controlled electric light switch, a pair of spring terminals normally tensioned to contact with each other for closing an electric lighting circuit, a push rod having a pawl adapted to be operated by the closing of a door to force the pawl between the terminals and thereby to break the
10 lighting circuit, a spring for operating the push rod and pawl to permit the closing of the terminals when the door is opened, and a movable member operable at will for separating said terminals and thereby breaking
15 the circuit when the pawl of said push rod is withdrawn from between the terminals by the opening of the door.

In witness whereof I have hereunto set my hand this 29th day of May 1922.

JOSEPH M. KERN.