April 2, 1935. R. L. SMITH 1,996,389

PORTABLE ELECTRIC LIGHTING APPARATUS

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Fig. 1.

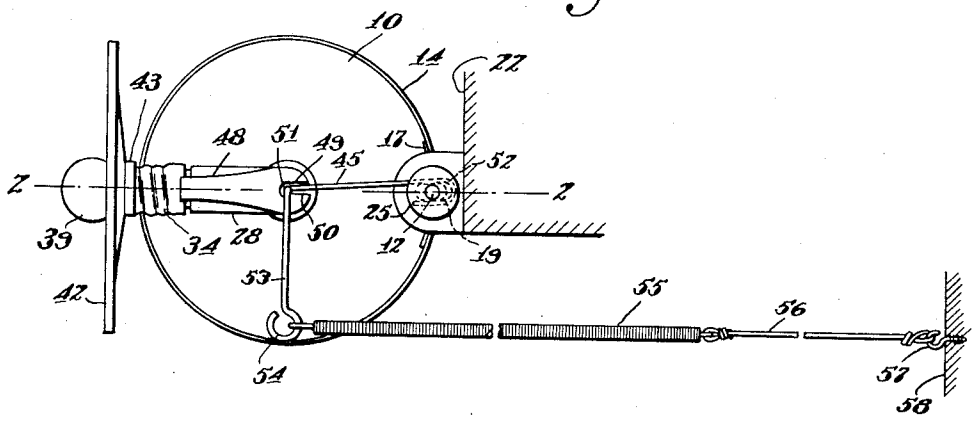
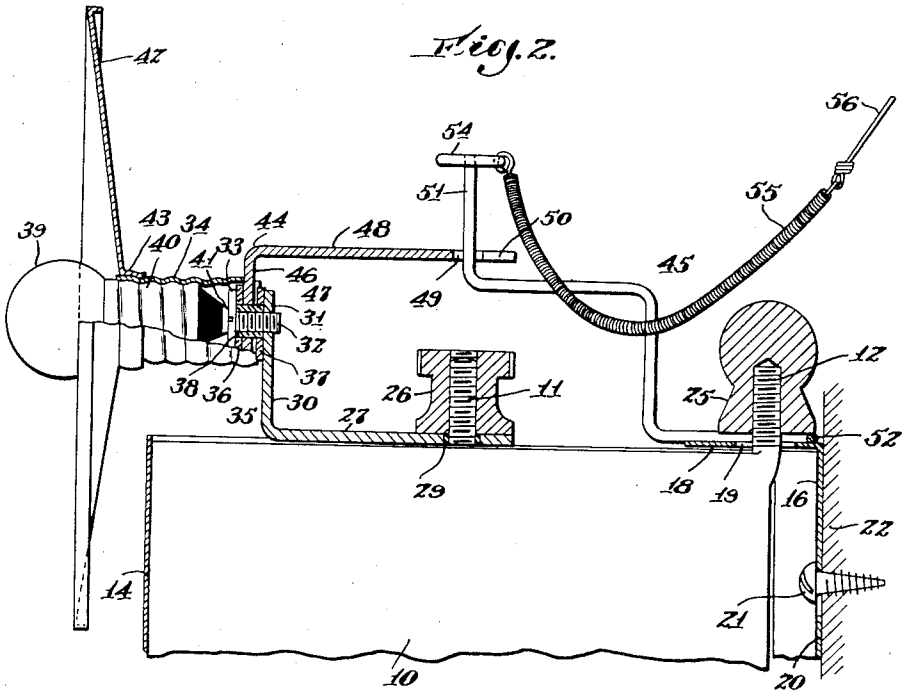


Fig. 2.



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PORTABLE ELECTRIC LIGHTING APPARATUS

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Fig. 3.

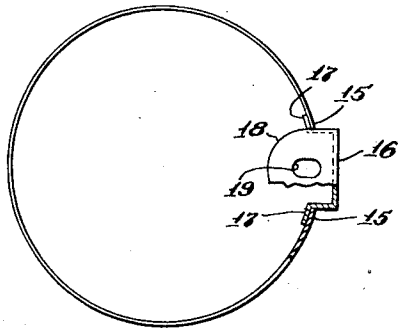


Fig. 4.

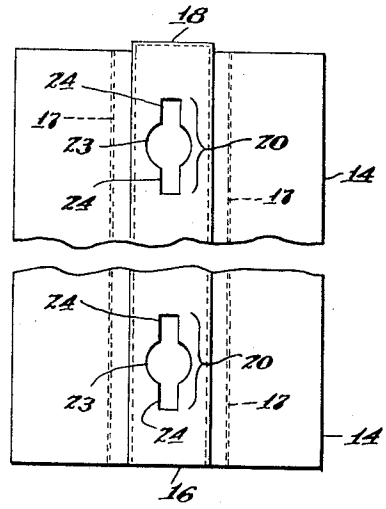
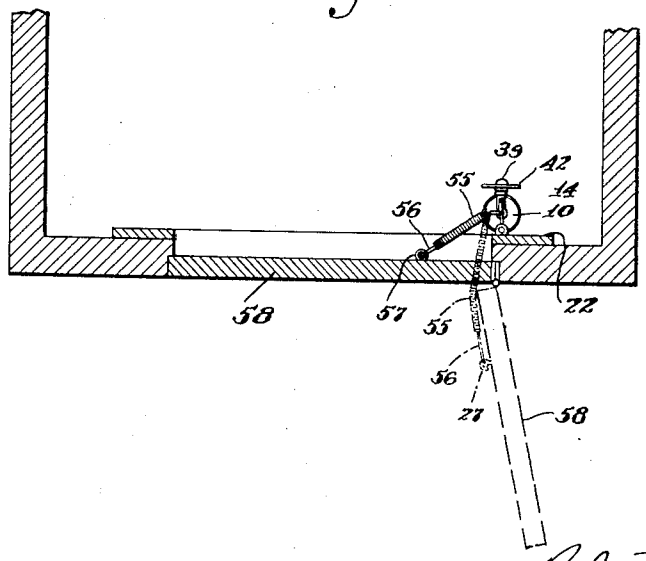


Fig. 5.



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PORTABLE ELECTRIC LIGHTING APPARATUS

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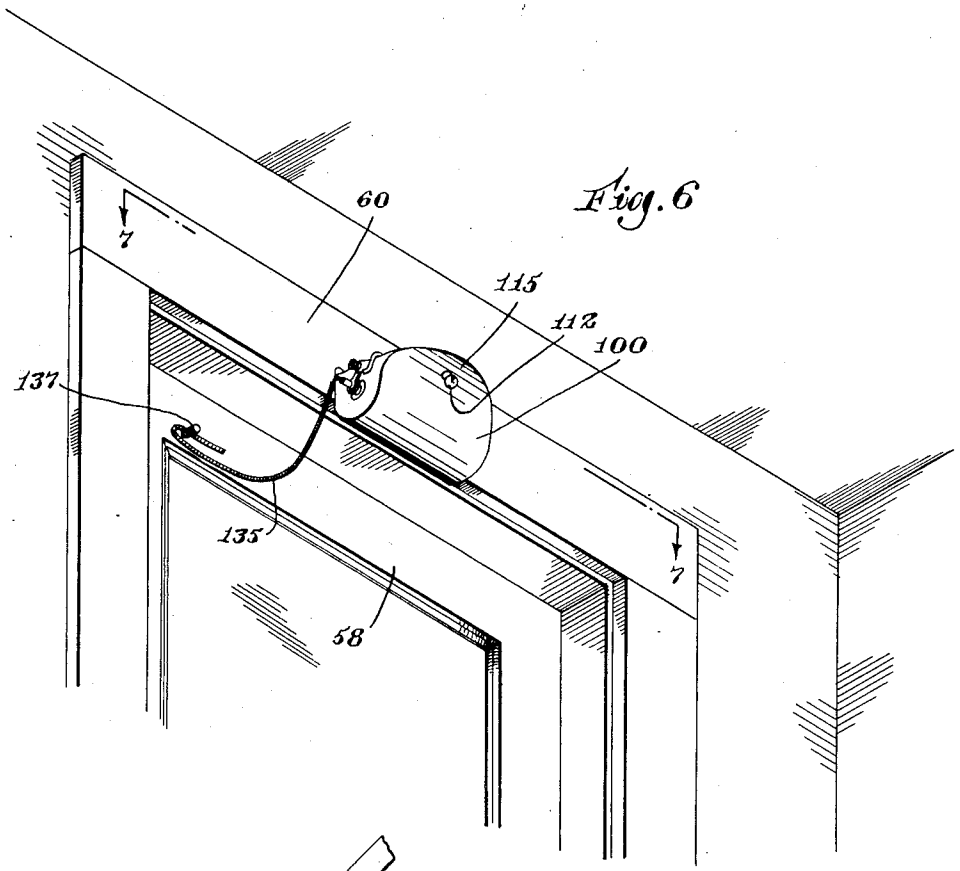

Fig. 6

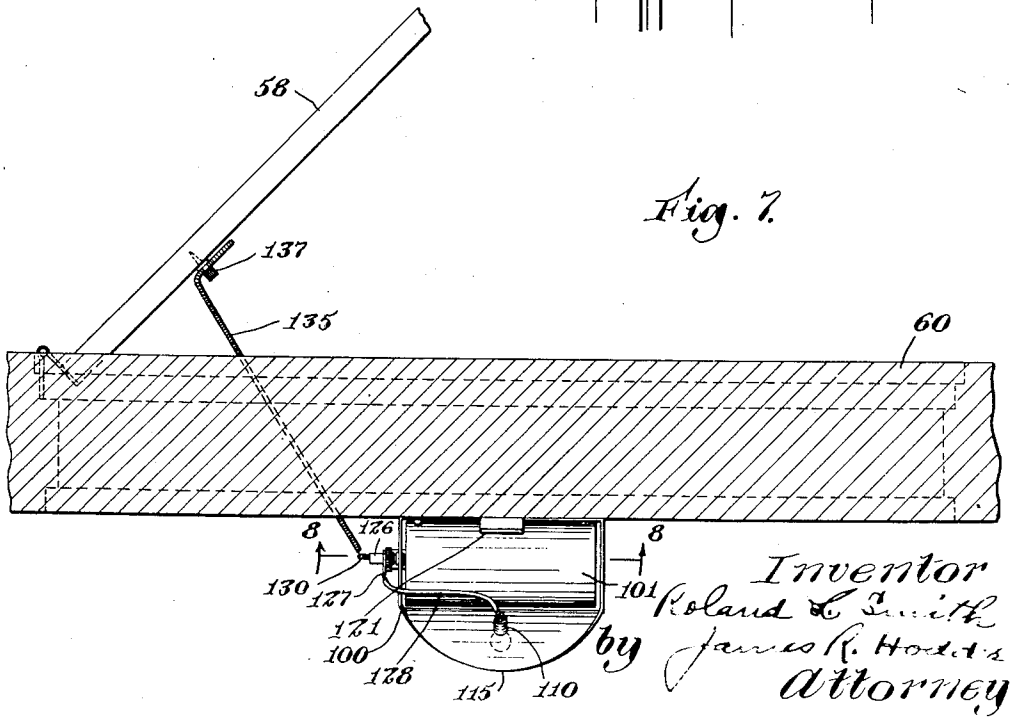

Fig. 7.

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Fig. 8.

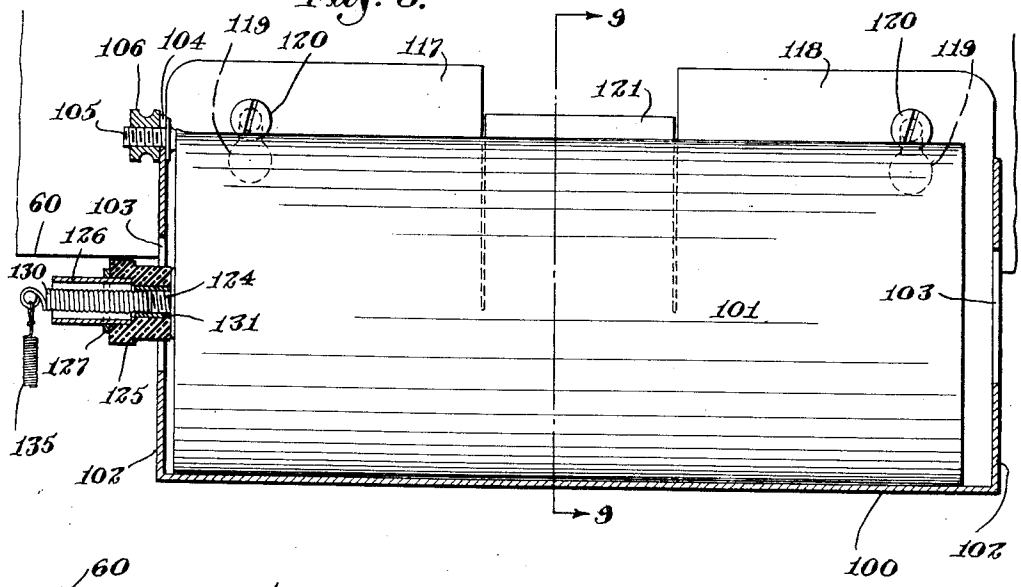

Fig. 10.

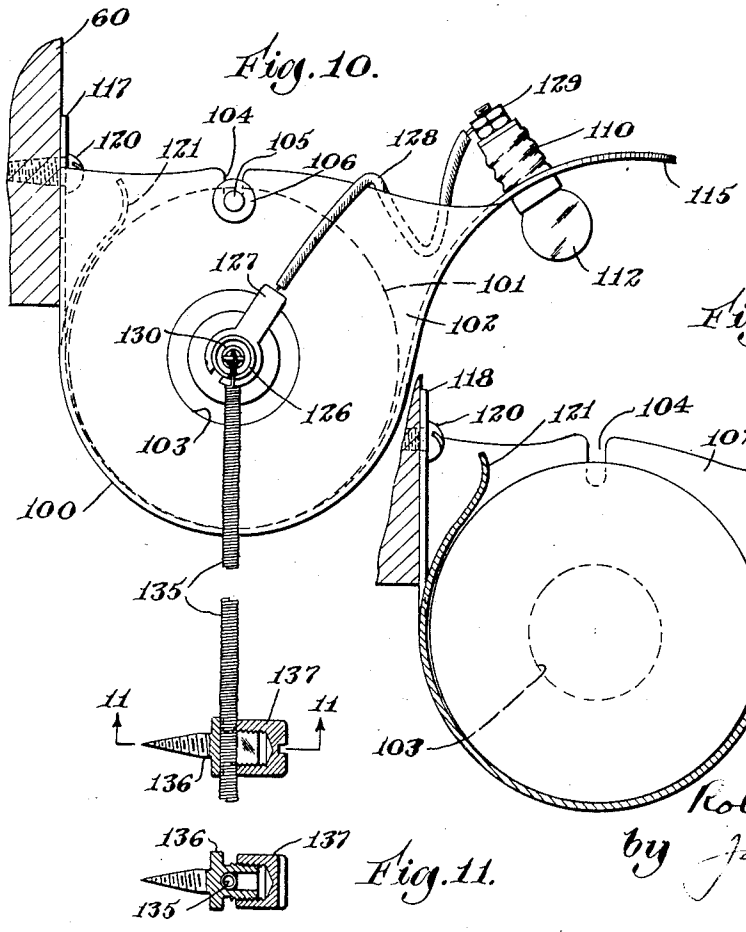

Fig. 9.

Fig. 11.

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Patented Apr. 2, 1935

1,996,389

UNITED STATES PATENT OFFICE

1,996,389

PORTABLE ELECTRIC LIGHTING APPARATUS

Roland L. Smith, Belmont, Mass.

Application April 29, 1931, Serial No. 531,419

2 Claims. (Cl. 240—10.61)

My present invention is a portable electric lighting apparatus, and is a continuation, in part, of my prior application Ser. No. 324,508, filed December 7, 1928, on "Electric lighting apparatus".

Important objects of the invention are to provide an apparatus, consisting of a holder, casing, or the like adapted to receive, preferably by switching or spring action, a portable dry cell battery, such as the usual "Eveready" flashlight battery, or radio battery. Preferably my holder is so constructed and arranged as to permit positioning of the battery interchangeably, for convenience, to both terminals, either at one end or the other of the holder, and to permit instant and ready removal and replacement, or renewing by another battery after a dry cell has burned out. On the holder I provide a lamp socket adapted to be readily connected to one terminal of the battery, and to the other battery terminal I interpose a novel and simple acting switch so that the lamp socket and electric lamp fitted thereto on the holder may have the circuit completed on a predetermined action of the switch.

My invention is of very great importance and usefulness either as a portable electric lighting device or to have the holder affixed at any convenient place in a house, such for example as a closet door, a cellar door, garages, vestibules, telephone booths, etc. where electric current is either not available or not installed.

An important feature of the present invention is the provision of a novel type of switch between one terminal and the electric lamp socket, whereby a universal adjustability of the holder, and a cord, spring, or means to operate the light at predetermined positions and intervals is obtained. My novel switch comprises a current conducting member, having an opening therein or therethrough, preferably round, through which opening a movable spring member is led and arranged so that the spring member, while normally in spaced relation to the sides of the opening and hence of the contact, may be duplicated in any direction throughout a complete circle of 360° and make contact with the enclosing fixed portion at any point, thus completing the circuit and lighting the lamp.

A further important feature in the present invention is that the means to operate the switch is preferably united to a movable member, such for example as the swinging door of a closet, cellar, telephone booth, or the like, while the holder is attached to a fixed part at any convenient point, and the means to operate the same, such as a cord, spring, or the like may be laid at any desired or convenient angle, and with provision that a door may be partly open before closing the switch and lighting the lamp.

As above explained, also the facility for closing the switch from any angle, whereby the central movable member will contact with the encircling fixed portion and permit contact and current conducting action at any point around the entire 360° of the encircling fixed member is of considerable importance.

Furthermore, by having the operating cord or spring arranged with a predetermined amount of slack so that the door will open substantially before the switch is closed I eliminate the objections heretofore found with such automatic devices which turned on the light the instant that the door was partly opened, thus often permitting the light to remain on when the door was ajar, and the fact that the light was on would not, otherwise, be noticeable. When a portable battery is employed, such accidental leaving of the switch on would very quickly run down the battery and render the device useless. Whereas, by my invention, the battery is not brought into service until the movable part, such as the door, is in a predetermined open position, or, in the case of a telephone booth, with the door completely closed.

A still further important feature and object of my present apparatus is the facility with which the same may be adjusted to operate at exactly the predetermined position of the door or opening member desired.

Other advantages and novel features and combinations of my device will be hereinafter more fully pointed out and claimed.

In the drawings I have illustrated two modifications of my apparatus.

In the drawings,

Fig. 1 is a plan view of the lighting apparatus embodying the invention and as illustrated in my said prior application, of which this is a continuation in part;

Fig. 2 is a sectional view on an enlarged scale on the line 2—2 of Fig. 1;

Fig. 3 is a plan of the same, partly in horizontal section, of the battery mounting;

Fig. 4 is an elevation of the battery mounting, viewed from the side, attached to the support;

Fig. 5 is a plan, partly in horizontal section, illustrating the application of this apparatus to a door;

Fig. 6 is a view in perspective showing a modi-

fication of my holding apparatus in position as mounted at the top of a door;

Fig. 7 is a cross-sectional view on the line 7—7 of Fig. 6;

Fig. 8 is a horizontal view, partly in cross-section, of a modification;

Fig. 9 is a cross-sectional view on the line 9—9 of Fig. 8;

Fig. 10 is an end view of the apparatus showing same attached to a door jamb, and

Fig. 11 is a cross-sectional view of the adjustable holding and tensioning device on the line 11—11 of Fig. 10.

Referring to the drawings, and to the embodiment of the invention which is illustrated in Figs. 1 to 5 inclusive, there is shown a lighting apparatus comprising a battery (see Fig. 2), wherein a well-known six-inch dry cell 10, having a central threaded terminal 11 and a lateral threaded terminal 12. The latter is received in an appropriate mounting, such as a casing 13 (see Fig. 3), comprising a cylindrical metallic shell 14, having two margins 15, which are spaced to receive between them a channel member 16, having outwardly directed flanges 17 overlapping the inner faces of said margins, and suitably secured thereto as by spot welding.

The channel member has an inwardly extending projection 18, provided with an opening 19 to receive the lateral terminal 12 of the battery. The channel member is provided with appropriate lateral openings, herein "keyhole" slots 20 (see Fig. 4) to receive fastening elements, such as wood screws 21 (see Fig. 2) inserted in an appropriate support, such as a door casing 22 (see Fig. 5). Referring again to Fig. 4, each of these slots has a circular portion 23 for the insertion of the screw head, and a reduced portion or portions 24 elongated vertically to receive the shank of the screw. In cases where the casing is always to be mounted with the battery terminals upright, the upper reduced portion 24 will suffice, but in cases where the battery is to be mounted in an inverted position, the second reduced portion 24 extending in the opposite direction is employed. The casing is entirely open at one end, herein the bottom, for the insertion of the battery. The upper end likewise is open, though the opening is partially covered by the projection 18, for the insertion of the terminal 12 (see Fig. 2). A nut 25, threaded onto the terminal 12, serves to support the battery in the casing.

A nut 26, threaded onto the central terminal 11, secures to the latter an appropriate lamp support and current conductor, herein an L-shaped bracket 27 having a horizontal portion 28 provided with an opening 29 to receive the terminal, said bracket having a vertical portion 30 provided with a threaded opening 31 to receive a screw 32, having a head 33. The screw head is received within a lamp socket comprising a threaded metallic shell 34, provided at one end with an inwardly directed flange 35, which is clamped by the screw. The lamp socket is suitably insulated from the lamp support, as by insulating washers 36 and 37 and an insulating sleeve 38 about the shank of the screw 32.

The lamp socket receives an incandescent electric lamp 39, having a threaded base 40 screwed into the socket 34, said base constituting one of the lamp terminals. The lamp base has a central terminal 41, insulated from the terminal 40 and contacting with the head 33 of the screw 32. There is associated with the lamp a reflector 42 having a threaded boss 43 screwed onto the threaded shell 34 of the lamp socket.

A circuit from the battery terminals to the lamp terminals may be made and broken by a switch now to be described, reference being had at first to Fig. 2. As illustrated, the switch comprises two switch members 44 and 45, one adapted to be brought into contact with the other. The switch member 44 herein comprises an L-shaped piece having a vertical portion 46, which is conveniently supported by the bracket 27, but insulated therefrom by extending through an opening 47 in the lamp socket shell 34 into the latter, where it is interposed between the insulating washer 36 and the inwardly directed flange 35 of the shell.

Thus the switch member is insulated from the supporting bracket 27, and from the screw 32, but has electrical contact with the shell 34. The switch member 44 has a horizontal arm 48, provided with an opening 49 and a slot 50 leading therefrom to the end of the arm for the introduction of a vertically disposed portion 51 of the switch member 45 into the opening 49. The contact portion of the switch member 45 normally occupies a central position in the opening 49, and the construction of the switch member is such that the switch has a normal bias to an open position, i. e., it tends to resist movement of the contact portion 51 toward either side of the perimeter of the opening 49. To this end, the switch member 45 in the present example, is a piece of spring wire having a loop or eye 52 disposed about the lateral terminal 12, and rigidly clamped against the upper face of the projection 18 by the nut 25. When, therefore, pressure is brought to bear laterally in either direction against the contact portion 51 to bring it into engagement with either side of the opening 49, the switch is closed and a circuit is completed from the battery terminals to the lamp terminals.

As shown in Fig. 1, the switch member 45 is provided with a laterally extending arm 53 having an eye 54 for the convenient attachment of one end of an actuating member, herein a closely wound helical spring 55, whose other end is connected as by a wire 56, and a screw eye or hook 57 to a door 58, the arrangement being such that when the door is closed, there is a suitable slack in the connection between the switch member and the door. Because of this slack, the door can be opened to a considerable extent without causing completion of the lamp circuit, but when the door is opened to a greater extent, the lamp circuit is completed.

The advantage of this is that when there is sufficient light from other sources to illuminate the closet or other space, the user can open the door without completing the lamp circuit. But when there is insufficient light from other sources, the user can open the door farther, and thus cause the completion of the lamp circuit.

Referring to the modification illustrated in Figs. 6 to 11 inclusive, in this form of the invention I have devised a novel form of holder 100, which is attached to the fixed part 60 of the door jamb, either at the side or, preferably, above as shown in convenient position to connect the switch with the door 58. The holder 100 is preferably trough-shaped to receive the removable and renewable battery 101, the same having ends 102, each provided with a central opening 103 to receive a concentric terminal of the battery at either end, the same being so that the battery may be reversed in the holder. Immediately above the

central recess 103 and in each end also is a notch 104, in which the other terminal 105 of the battery 101 is fitted, a thumb screw 106 threaded thereon serving to hold and clamp the battery terminal 105 to the holder 100 at this point, thus utilizing the holder as one current conducting means from the battery to the lamp socket 110 holding the electric lamp 112. This lamp, or a plurality of lamps, may be positioned at any place desired on the holder but preferably I flare out the sides of the holder opposite that to which it is to be attached to the fixed part of the door jamb, as shown at 115, thus giving a better downwardly illuminating action within the closet, hall, stairway, or the like. In order to attach the holder to the portion 60, I extend the back of same in a vertical position, as shown at 117 and 118, with appropriate recesses 119 formed therein which may fit over attaching screws 120.

Preferably, also I form a portion of the holder 100 between the vertical sections 117 and 118 with an inwardly extending spring-clamping portion 121 to engage and hold the battery 101 when the same is fitted therein. The battery may be thus "snapped" in by spring clip 121, or assembled therein, or will be held snugly in position in addition to the thumb nut 106.

Around the central terminal 124 of the battery 101, I attach suitable insulating material 125 and, as shown in this modification, form a tubular member 126 carrying the usual type of spring clip terminal 127 connected by wire 128 to the base of the socket 110 at 129 by the usual clamping nuts.

The surrounding member 126 is the fixed portion of my novel switch, and the movable portion 130 extends outwardly through the member 126, and normally spaced from the sides thereof, being attached to the central terminal 124 by a ferrule 131 or in any other suitable manner. To operate the switch it is only necessary to incline or move the member 130, which may contact with the edge of the fixed encircling member 126 at any point throughout 360° of the same. Thus the switch is closed and the lamp 112 lighted. The switch 130 may be moved by hand, if desired, but where it is to be attached to the door, I secure a cord or spring 135, as shown, of suitable length to be attached to the adjusting and holding screw 136, a nut 137 being threaded on top of the adjusting screw and holding the end of the spring or cord 135 in adjusted position, as desired.

As clearly illustrated in Figs. 10 and 11, this clamping of the operating cord 130 can be quickly and easily effected and a considerable degree of slack in the operating cord or spring 135 can be provided to effect the operation of my novel switch when the door 58 is swung in any predetermined open position, as best shown in Fig. 7. The cap 137 can be loosened slightly and the elastic cord or spring 135 drawn therethrough, with the door 58 in the desired partly opened position, until the central switch member 130 contacts with the encircling portion 126 at any point and closes the switch and lights the lamp, thereupon the thumb nut 136 is tightened and the subsequent operations will be automatic.

Various modifications may be made within the scope of my present invention. Thus the lamp may be positioned at any desired place. The switch may also be variously positioned, either at the end, as shown, or at the bottom of the apparatus, or otherwise. The battery may be connected in any desired way, and the holding apparatus may be a slight metal framework instead of the trough-like receptacle, herein shown, as the present preferred form.

I claim:

1. In a lighting apparatus, the combination of a battery having two threaded terminals, a current-conducting bracket provided with an opening which receives one of said terminals, a nut threaded onto such terminal and securing said bracket onto such terminal, said bracket being provided with a threaded opening, a clamping and current-conducting screw screwed into said threaded opening, a lamp socket comprising a current-conducting shell insulated from said bracket and from said screw and secured by the latter to the former, a switch member secured by said screw to said bracket and electrically connected with said shell but insulated from said screw and from said bracket, a switch member adapted to make contact with the first mentioned member, and a nut threaded onto the second terminal and securing the second mentioned switch member to the latter.

2. In a lighting apparatus, the combination of a battery having two terminals, a lamp socket and a switch member supported by one of said terminals and insulated therefrom, said member being provided with an opening, and a switch member secured to the other terminal and having a contact portion received in and normally spaced from the sides of said opening, and a resiliently yieldable portion which normally maintains said contact portion in such spaced relationship with the sides of said opening.

ROLAND L. SMITH.