

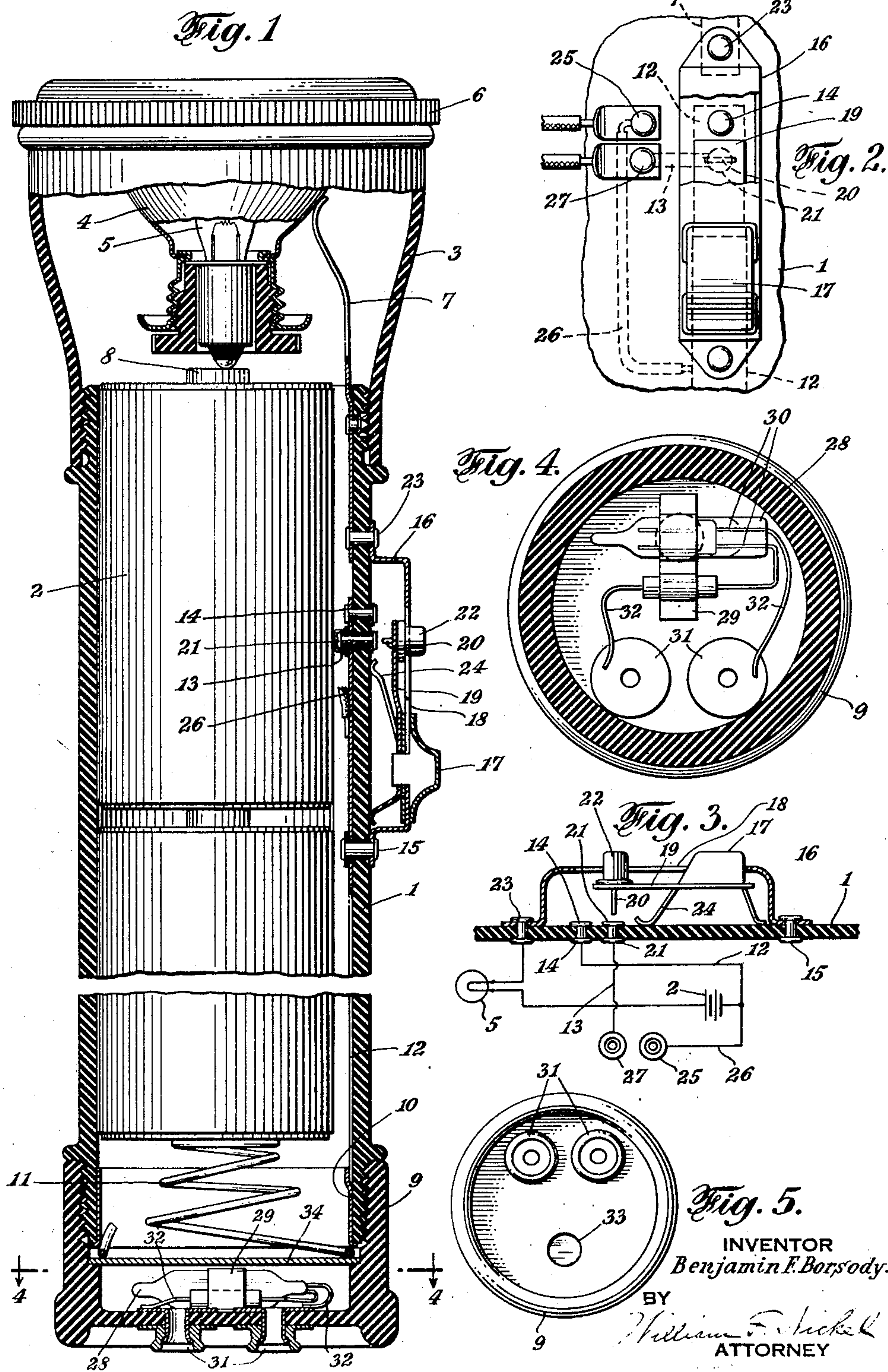
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FLASHLIGHT WITH TESTING ATTACHMENT

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FLASHLIGHT WITH TESTING ATTACHMENT

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1 Claim. (Cl. 175—183)

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This invention is an improvement in electric hand lamps; particularly a portable lamp having a casing containing a light bulb and a source of electric energy and bearing a switch to enable the bulb to be energized or extinguished by operation of the switch to close or open the circuit.

An important object of the invention is to provide an electric lamp of the flashlight variety, having the usual design to serve for illuminating purposes; and further equipped with terminals to adapt the lamp for testing other circuits and separate electrical appliances of numerous kinds.

In its preferred form the invention comprises a simple and inexpensive attachment or addition to an otherwise conventional flashlight lamp arranged so as to render the lamp useful as a circuit tester or continuity tester, with its battery supplying current, and its incandescent lamp acting as a current indicator, with no loss or impairment of its capacity for illumination.

The addition comprises two terminals or electrical connector elements of suitable form in or on the flashlight casing, disposed electrically in circuit with the switch; so that by connecting thereto suitable test leads or wires, the lighting or not lighting, or degree of incandescence of the lamp bulb in the casing will reveal whether the circuit or apparatus requiring examination is "open," "closed" or has resistance therein.

The terminals mentioned above are two in number, and are so controlled by the flashlight switch that, when the movable member of the switch is in the "off" position, they are inoperative or disconnected in order to make impossible any accidental shorting; as for example by contact with other metal objects when carried in a tool box. The testing terminals are also so disposed that when said movable member is advanced to its intermediate position, the testing terminals or elements are put into readiness for connection with an external circuit, and the circuit of the lamp in the casing and the circuit or device to be proved can be closed or broken at will.

Another object is to provide a flashlight casing with an accessory independent of the lamp bulb and battery in said casing adapted to test circuits and parts thereof already connected to an external independent source of electric energy.

The advantages and the nature of the improvement are made clear in the following description; and the novel features are set forth in the appended claim. This disclosure, however, is by way of example only, and I may adopt alterations in structural details without going beyond

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the limits of the invention or deviating from the essential construction defined by the general meanings of the terms in which the claim is expressed.

5 On the drawings,

Figure 1 is a section of an ordinary flashlight casing with my invention incorporated therein.

10 Figure 2 is a view showing how the additional circuit terminals are related to the switch terminals of said casing.

Figure 3 is a diagram of the circuit connections for the lamp circuit and the outside circuit.

Figure 4 is a sectional view on the line 4—4 of Figure 1; and

15 Figure 5 is an outside view of the cap for the rear end of the casing.

20 The flashlight has a tubular casing 1 that receives and contains the battery cells 2. At the forward extremity is the cap or hood 3, detachably engaging the casing 1, and containing the reflector member 4 and the lamp bulb 5 mounted in the member 4. The rim of the cap 3 is detachably engaged by a flanged ring 6 by which the lens, not shown, is retained in position. To the inside of the casing near the hood 3 is affixed a conductor strip 7 which makes contact with the member 4; one terminal of the filament in the lamp bulb 5 being in circuit with the parts 4 and 7 and the other connected as usual to the cells 2 by contact of the end of the neck of the lamp with the middle pole 8 of the nearest cell 2.

30 The opposite end of the casing is closed by a detachable cap 9, and in this end is a circular metal lining 10, flush with the edge of the casing 1 or projecting slightly therefrom. In the cap 9 is a metal spring 11 coiled into a conical shape, with the smaller end adapted to press on the bottom of the metal shell of the lower cell 2 and the opposite extremity at the circumference engaged by the edge of the lining 10 when the rear cap 9 is secured on the casing, as by screwing it into place. To the lining 10 a conductor strip 12 in the casing is attached; extending forward towards the strip 7; and connected to a riveted terminal 14. A metal lead 13, that may be embedded in the side of the casing 1, lies adjacent the rivet 14 and is insulated from it, for a purpose to be explained later herein; and the strip 12 is further secured to the casing 1 by an insulated rivet 15 which also fastens the rear end of the switch cover 16 to the casing. This cover is also of metal and contains a movable switch member 17 of metal, part of which projects from the cover and is movable along a slot 18 in the top of same.

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The movable switch member has the form of an inverted U, the arms of which rest on the casing 1; the part projecting through the slot 18 being narrow, so that the cover retains the member 17. Affixed to the member 17 is a resilient metal spring 19 having a projection 20 just above a metal rivet or terminal 21 affixed to the casing 1; both terminals 14 and 21 being under the cover 16. In the top of the cover is a depressible button 22 resting on the arm 19. The strip 7 is attached to the casing 1 by a rivet 23 which is in contact with the front end of the cover 16 and in circuit therewith. Both rivets 14 and 21 go through the strip 12, but the rivet 21 is insulated from this strip.

As illustrated in Figure 3, the circuit is open, but if the member 17 is pushed forward with the hand, so that the terminal or projection 20 is directly above the rivet terminal 14, pressure on the button 22 will close the circuit through the lamp. By release of the button 22, the circuit is broken. If the member 17 is pushed forward far enough for the forward leg 24 to engage the rivet 14, the circuit is closed and remains closed till the member 17 is retracted.

For testing, the rivet 21 is joined to a terminal 27 affixed to the casing 1 outside of the cover 17 by the conductor 13. Adjacent the terminal or element 27 is a second terminal 25 connected to the shell of the rear battery cell 2 by way of conductor 26, joined to the strip 12.

The terminals or connector elements 25 and 27 may have the form of spring clips adapted to grip the ends of wires under them; or they may be ordinary binding posts with fastener nuts thereon; or metal parts such as are used in snap button fasteners; the extremities of the wires W to be joined thereto being properly shaped.

When the sliding member 17 is retracted to extreme position as shown in Figure 3, then both the flashlight light button 22, and the testing terminals 25 and 27 are ineffective and no accidental short-circuiting is possible. But when the member 17 is pushed to the intermediate position, then the finger 20 is over the rivet 14. Pressure on the button 22 now will close the circuit for the lamp. Also, with the leg 24 making contact with rivet 21, tester terminals 25 and 27 are so united to the lamp and the batteries, that the bulb will illuminate, unless the device bridged across the elements 25 and 27 is damaged or defective. The circuit is from the right end of the battery in Figure 3 to terminal 25 through the device tested to the terminal 27, then by way of conductor 13 to rivet 21, the leg 24, member 17, switch cover 16, conductor 7, and lamp 5 to the other pole of the battery; button 22 not being depressed at this time. But the button 22 can be pressed in at any time to show that the bulb 5 is in working condition. Thus one can test fuses, lamp filaments, electron tube filaments and heaters, switch plugs and sockets; also wiring can be examined, shorted or broken down condensers can be tried and the faults located, and other appliances can be investigated for breaks, short circuits and grounds.

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In the rear cap 9 is a neon tube 28 held in place by a fixed band 29 fastened to the cap. The electrodes 30 of this tube are joined to eyelet rivets 31 by conductors 32 in the cap, so that terminals can be plugged in at the eyelets 31 and connected to the tube. In the bottom of the cap is a sight opening 33. This tube 28 costs but little, will roughly measure voltages, distinguish between alternating and direct current, disclose the hot side of the line from the grounded side, test fuses in place, check plate voltages in radio circuits, test engine spark plugs, and test for radio frequency energy. The invention thus adapts a flashlight to serve many purposes; and the entire plan requires a merely nominal outlay and very little structural alteration of the hand lamp casing. The bulb can always be illuminated to examine any device or circuit and assist the testing operation.

When the device is used to test anything connected to the outside terminals 25 and 27, the lamp bulb 5 will also indicate if there is too much resistance in such circuit, as well as revealing any damage or defect, by failing to light up. The cap 9 may have a shoulder therein above the neon tube 28 to provide a seat for a disk 34, which will cover and protect this tube and also act as an abutment for the larger end of the spring 11.

Having described my invention, what I believe to be new is:

An electric lamp comprising an insulator casing, a source of electric energy therein, a lamp bulb, a metallic switch cover on the outside of the casing, a metallic strip in the casing for connecting the cover to one terminal of the light bulb, the other terminal of the bulb being connected to one pole of said source, a terminal beneath said cover, a conductor strip joining the last-named terminal to the other pole of said source, a metallic switch member within said cover and in contact therewith and exposed to the outside thereof, a metallic spring strip carried by said switch member and having a terminal thereon, a pair of connectors exposed on the outside of the cover, one of said connectors being connected to said conductor strip, and another terminal secured to the casing under said cover and adjacent the first terminal and joined to the other connector.

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