April 29, 1958 H. H. HAYS 2,832,930

ELECTRICAL TESTING DEVICE

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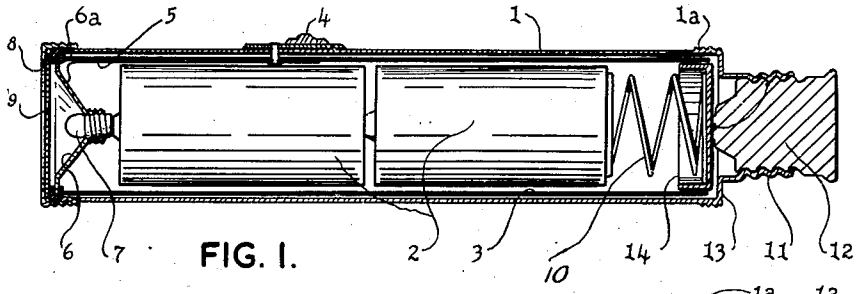


FIG. 1.

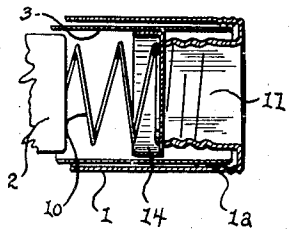


FIG. 3.

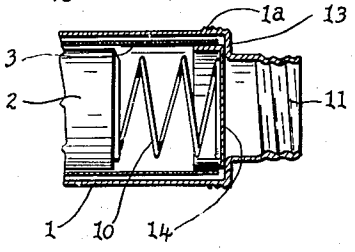


FIG. 2.

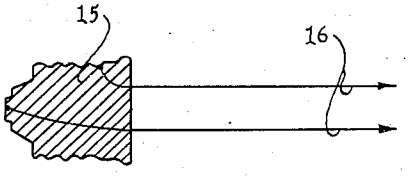


FIG. 4.

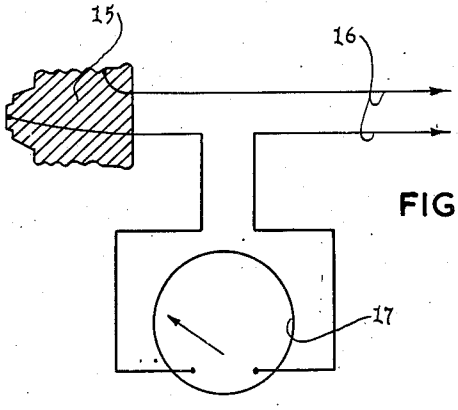


FIG. 5.

Inventor
HARRY HOWELL HAYS
By W. Jerome Haskett
Attorney

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ELECTRICAL TESTING DEVICE

Harry Howell Hays, El Paso, Tex.

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7 Claims. (Cl. 324—53)

The invention relates to improvements in an electrical testing device and appertains particularly to a simple circuit testing means in combination with a portable flash light.

An object of the invention is to provide a flash light having a make-and-break contact means, that is separate from the conventional thumb switch and useable for testing fuse plugs, light bulbs or other low voltage circuits.

Another object of the invention is the provision of a flash light having a socket-like base adapted to receive a circuit connecting means such as a fuse plug which when screwed into place will engage an element in the casting, break the contact between the battery and the casing, and re-establish the contact between the battery and the casing through the medium of such fuse plug or the like, whereby the fuse plug may be tested to ascertain if it is in good working order, by lighting the flash light bulb.

The foregoing and other objects and advantages of the invention, will appear more fully hereinafter from a consideration of the detailed description which follows, taken together with the accompanying drawings as illustrated by way of example, in which:

Figure 1 is a longitudinal sectional view through a combination flash light and fuse tester, showing contact being established between the casing and the battery through a test fuse;

Figure 2 is a fragmentary sectional view, similar to Figure 1, of the base part of a flash light, showing electrical contact being established in a normal manner through the battery, spring, and rear end of the casing;

Figure 3 is a fragmentary sectional view of the base part of a flash light, showing a slightly modified socket structure;

Figure 4 is a diagrammatic view of a screw plug, suitable for accommodation in my flash light device, for testing various types of electrical circuits; and

Figure 5 is a diagrammatic view of a modified circuit-testing screw plug, similar to that shown in Figure 4, having a volt meter included in the circuit.

Referring now to the drawings, in which similar reference numerals designate corresponding parts in all the figures, my invention is herein illustrated as comprising a flash light having the usual casing barrel **1**, housing a pair of batteries **2**, surrounded by a sleeve of insulating material **3**, a battery thumb switch **4**, with sliding circuit closer conductor bar **5**, reflector **6** and circumferential insulating ring **6***a*, lamp bulb **7**, a flanged front end cap ring **8** threaded on the open front end of the barrel **1** and a glass lens **9** retained by said ring, together with a compressed coil spring **10** in the opposite end of said barrel **1** acting to press said batteries into contact with said bulb **7**; all of which structure is well known and generally found in a cylindrical or barrel type of hand flash light.

In place of the conventional open rear end of the barrel with a screw-on type end cover cap, I provide an open ended coaxial socket **11** of reduced diameter and in open communication with the interior of barrel **1**. Said socket,

threaded for the reception of an ordinary fuse plug **12**, connects with the rear end of the barrel by a step or shoulder **13**. If desired the end of the barrel immediately adjacent to the shoulder **13** may be exteriorly threaded as **1***a* to receive a rear cover cap, not shown. It must be understood that the fuse-receiving socket **11** here shown as integral with the rear end of the casing barrel may be made as a separate screw-on part and additionally, that the socket **11** may project forwardly inside the barrel, as shown in Figure 3, instead of rearwardly therefrom, as in Figures 1 and 2.

In order to make normal electrical connection between the battery, coil spring, and casing, a saucer-like disc **14** is provided, that fits loosely and slidably inside casing **1** and insulating sleeve **3** and is adapted to be engaged by the coil spring **10** and bear against the shoulder **13** of the socket **11**, as in Figure 2, or against the open inner end of the socket **11**, as in Figure 3.

When the flash light is to be used as a testing device, a fuse plug **12**, or the plug part of a bulb or other electrical testing device, is screwed into the threaded socket **11** contacting the disc **14** and disengaging it from the shoulder **13** of the casing thus breaking the normal connection between the battery and the casing; contact for the flash light circuit being re-established through fuse or other plug **12**.

It will thus be seen that unless the fuse plug, bulb or other circuit being tested is in good working order, the electrical circuit in the flash light that has been interrupted by breaking the usual spring-urged contact between the disc and casing will not be re-established in the flash light, and the lamp **7** will not light. When it is required to test other types of electrical circuits, a screw plug **15**, having prongs **16** (or a socket carrying the terminals of an extension cord) may be used in place of the fuse plug **12**. This is shown diagrammatically in Figure 4.

Figure 5 shows a similar testing arrangement to that shown in Figure 4, with the addition of an ammeter **17** placed in the circuit. It may be found desirable to incorporate the volt meter into the structure of the screw-in plug, in which case the plug would be a little longer.

In use, it will be seen that this flash light may be used in the regular way by itself; without any fuse plug or circuit testing appliance screwed in the socket-like end cap. It may also be used as a flash light and as a convenient storage for one fuse plug, included in the circuit and thus under test, as a handy and useful household appliance for locating the fuse box when a domestic circuit blows, for testing the row of fuses in the box and with one available fuse that is of known serviceability. The various other circuit testing uses to which this flash light can be put will be readily apparent to those regularly employing prod testers and volt meters.

From the foregoing description taken in connection with the accompanying drawings, it will be manifest that an electrical testing device is provided that will fulfill all the necessary requirements of such a device, but as many changes could be made in the above description and many apparently widely different embodiments of the invention may be constructed within the scope of the appended claims, without departing from the spirit or scope thereof, it is intended that all matters contained in the said accompanying specification and drawings shall be interpreted as illustrative and not in a limitative or restrictive sense.

Having thus described the invention, what is claimed as new is:

1. A flash light comprising in combination with the usual casing, a light bulb therein, a battery-applied electric circuit for said bulb, and switch in said circuit; a socket on said casing, having its inner end in open communication with the interior of said casing for the re-

ception of a removable plug; and a circuit breaker normally lying across the inner end of said socket and completely closing the passage between said socket and casing; said circuit breaker normally engaging and grounding to the inner end of said socket and being operable by a plug inserted in said socket to break such normal grounding of the circuit which is then grounded through the plug to the side wall of said socket.

2. A fuse plug testing flash light comprising in combination, a casing; a light bulb therein; a battery supplying an electric circuit to said light bulb; a threaded socket on said casing having an opening in the inner end thereof in open communication with the interior of said casing; and a normally-closed circuit breaker associated with said socket normally closing completely the opening in the inner end of said socket and adapted for actuation by a fuse plug screwed in said socket; such fuse plug acting to open said circuit breaker to interrupt the battery circuit to said light bulb and to re-establish the circuit through the usual fusible element in the fuse plug.

3. A testing flash light as defined in claim 2, wherein said fuse-actuated circuit breaker includes a spring-urged contact member disposed across the base of said socket and normally making contact between said battery and said casing.

4. In a flash light circuit testing device, in combination, a flash light casing provided with conventional battery, insulating sleeve, battery thumb switch, conductor bar, reflector, lamp bulb, and coil spring; an open socket of reduced diameter, on the end of said casing opposite the lamp bulb having an opening in its inner end in communication with the interior of the flashlight casing, said socket being threaded and adapted to accommodate a similarly threaded element to be tested; a saucer-like disc slidably positioned in said casing adjacent the socket end thereof and normally completely closing the opening in the inner end of said socket, said disc being adapted to be engaged by said coil spring and urged into contact with saiid casing about said open socket to establish normal electrical contact between said battery and said casing, said normal contact being broken when said element to be tested is screwed into said socket a sufficient distance to unseat said disk from said annular shoulder, the interrupted electric circuit being re-established through said element to be tested.

5. A flash light testing device, as claimed in claim 4, in which said element to be tested comprises a fuse plug.

6. A flash light testing device, as set forth in claim 4, wherein said element to be tested comprises a screw plug adapted to accommodate an extension cord to establish remote contact between said flash light and a further electric circuit.

7. A flash light testing device, as claimed in claim 4, in which said saucer-like disc is rigidly secured to one end of said coil spring.

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