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[54] **VISUAL GROUND FAULT INDICATOR**

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[52] **U.S. Cl.** **324/51,** 324/66, 340/255

[51] **Int. Cl.** **G01r 31/02**

[58] **Field of Search** 324/51, 66; 340/255

[56] **References Cited**

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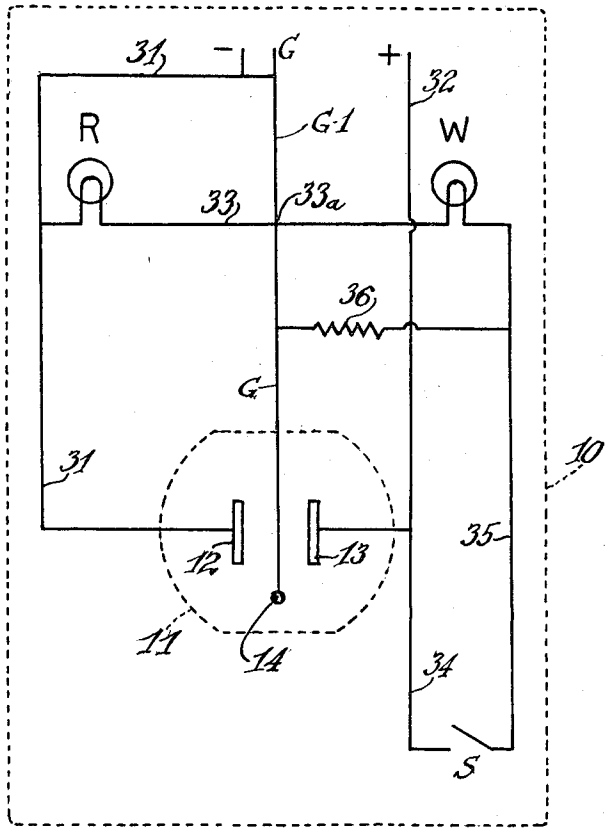
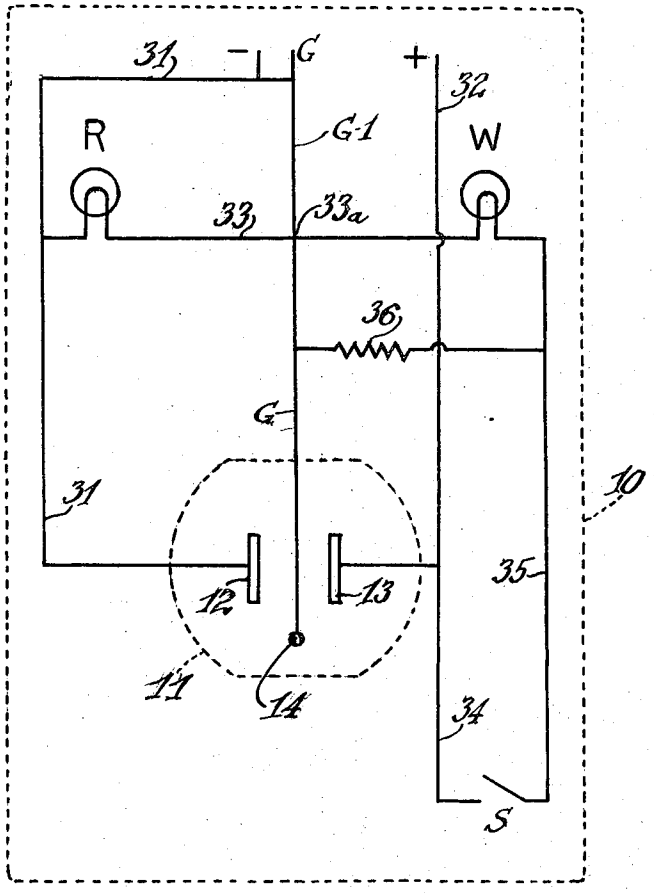
Primary Examiner—Gerard R. Strecker

[57] **ABSTRACT**

A ground fault testing receptacle comprising a frontal panel incorporating a standard electrical service outlet and a grounding terminal. The panel has a red signal lamp at one side, a white signal lamp at the other side, and a toggle switch below. If the ground line for the premises is normal, the closing of the switch will turn on the white lamp. However, it will turn on the red lamp if the ground line is broken. The signals are conditions for plugging an electrical appliance into the outlet.

2 Claims, 1 Drawing Figure




31
−
G
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32
R
G-1
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33
33a
36
G
31
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S

VISUAL GROUND FAULT INDICATOR

This invention relates to electric service wiring in buildings and dwellings, and more particularly to devices for protecting the service, appliances and persons using the same. At times conditions in the wiring installation, or interference with the same from outside sources, create a ground fault whose presence does not become known to the user of the electric service, but nevertheless impairs the latter. Another failure often undetected is a defect in an appliance which could cause a short when the appliance is plugged in for use, and even create a safety hazard to the person attending the appliance or about to use the same. Thus, failures in service, and hazards which can be very serious — and even fatal — may exist without revealing their presence, and create a risk when an appliance not known to be defective is connected with a service outlet. Also, in some circuit-protecting devices, their operation depends on a return of electric current through the person handling the appliance, which is an unnecessary and often a dangerous process and should be avoided.

In view of the above situation, it is one object of the present invention to provide a replacement of the common wall outlet in the form of a testing receptacle which serves both as a service outlet and a test unit for appliances plugged in only when their use is desired, such as electric broilers, fans, heaters and the like.

A further object is to provide a testing receptacle having a lamp which emits a white light when a test switch is closed, to indicate that the ground line is in good order.

Another object is to provide the testing receptacle with a lamp which emits a red light when the test switch is closed, this indicating that the ground line is defective or interrupted.

A better understanding of the invention may be gained by reference to the accompanying drawing, in which a diagrammatic view of the testing receptacle is shown.

Referring specifically to the drawing, **10** denotes a wall panel representing a standard electric service outlet, **11** being its socket, **12** and **13** the service terminals, and **14** a ground terminal. These elements are in front of a suitable box (not shown).

A pair of lamps are in view at the top of the panel, the lamp R being red and the lamp W being white. At the bottom is a toggle switch S. The power supply is represented by a negative line **31** connected to a ground line G, and a positive line **32.**

In the circuit of the testing receptacle the ground line G is connected to the ground terminal **14.** The negative line **31** is connected to the service terminal **12**; and the positive conductor **32** is connected to the service terminal **13.** A conductor **33** connects one of the terminals of the lamps R and W, and joins the ground line G at **33***a*. The other terminal of the lamp R is connected to the conductor **31.** The terminal **13** is connected by a conductor **34** to one terminal of the switch S, while the other terminal of the lamp W is connected by a line **35** to the other terminal of the switch. A resistance **36** greater than that of the lamp W connects the ground line G with the conductor **35.**

Before an appliance is plugged into the socket **11,** the ground circuit may be tested to determine its condition. The switch S is closed for this purpose; and the normal condition of the ground is determined if the lamp W

lights. The circuit involved in this test comprises the positive line **32,** the terminal **13,** conductor **34,** the switch S, conductor **35,** the lamp W, conductor **33** and the ground line G. The lamp and the resistance **36** are in parallelism, with the lamp forming an easier path for the current than the resistance.

When the same test is tried, and only the lamp R lights, this is an indication that the ground is interrupted, such as at a point G-**1.** The circuit now comprises the positive line **32,** terminal **13,** conductor **34,** the switch S, conductor **35,** resistance **36,** ground line G, conductor **33,** the red lamp R, and the negative return conductor **31.** While the white lamp is a bypass from the circuit just described, it will not light because the resistance of the red lamp R is too high with the resistance **36** in parallel.

When the test is made as first described, and the normalcy of the ground determined, the appliance may be plugged in. In case it does not operate, one fault may be a break or loose connection of the appliance. Another may be a short in the appliance. In this event the house fuse will "blow" and cut off the current from the premises.

The result in the second test is of course a notice that no current is obtainable from the outlet, so that the appliance will not operate when plugged in. Also, the light R is a warning in this event not to plug in the appliance because — if it is defective — the house current will be cut off.

It is now apparent that the novel testing receptacle is an important development of the conventional current outlet providing a quick way to test the ground circuit before an appliance is added to the circuit. The testing circuit is incorporated in the conventional outlet panel instead of being a separate unit, and combines with the outlet in compact form. The additions to the house circuit are few, and the apparent change is merely a replacement panel.

I claim:

1. A ground fault indicating receptacle comprising a frontal panel with an outlet presenting a pair of service terminals and a ground terminal, red and white signal lamps mounted in the panel, a switch also mounted in the same and operable to light the white lamp in case of a normal ground connection and the red lamp in case of an interrupted ground connection, a resistance element, a circuit for said lamps, resistance element and switch, including a ground line connected to said ground terminal, a grounded negative feed line connected to one service terminal and a positive feed line connected to the other service terminal wherein one terminal of each lamp is connected to the ground line, the other terminal of the red lamp is connected to the grounded negative feed line and said one service terminal, the other service terminal is connected to one side of the switch, the other terminal of the white lamp is connected to the other side of the switch and said resistance element interconnects said other terminal of the white lamp with the ground line.

2. A visual indicating device for a faulty ground connection in a first electrical service outlet circuit comprising a receptacle with two service terminals and a ground terminal, a grounded negative feed line connected to one of said service terminals, a positive feed line connected to the other of said service terminals, a ground line connected to the ground terminal, and a second circuit comprising a first conductor intercon-

necting the grounded negative feed line and one terminal of a switch, a pair of differently colored lamps in series with said first conductor, a second conductor interconnecting said positive feed line and the other terminal of said switch and a resistance element connected to said ground line and to said first conductor in parallel relationship with one of said lamps, said element

having an impedance greater than that of said one lamp, said first conductor being joined to said ground line between said lamps, whereby when said switch is closed, said one lamp will be lighted if the ground line is in order and said other lamp will be lighted if the ground line is faulty.

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