United States Patent

Dapilito

[15] **3,662,259**

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[54] CIRCUIT CONTINUITY TESTER WITH WIRE INSULATION PIERCING MEANS

[72] Inventor: **August A. Dapilito,** 55 Bowers St., Jersey City, N.J. 07307

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[52] **U.S. Cl.** **324/51**
[51] **Int. Cl.** **G01r 31/02**
[58] **Field of Search** 339/96; 324/51, 52, 72.5; 174/556

[56] **References Cited**

UNITED STATES PATENTS

2,445,667	7/1948	Fuglie	324/51
3,363,171	1/1968	Sietmann et al.	324/72.5 X
2,276,736	3/1942	Olson	324/51

FOREIGN PATENTS OR APPLICATIONS

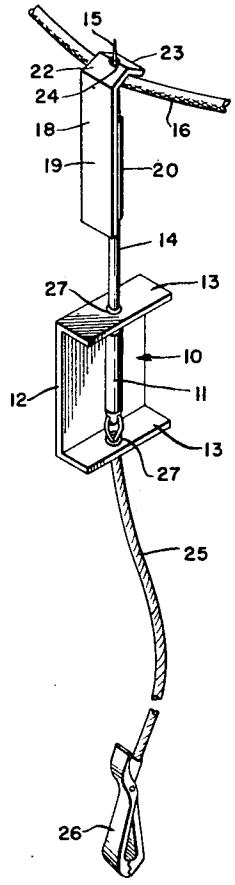
829,353	6/1938	France	324/51
306,679	7/1917	Germany	324/51

Primary Examiner—Gerard R. Strecker
Attorney—Anthony J. Castorina

[57] **ABSTRACT**

A circuit continuity tester for automotive circuits and the like features a simplified wire stabilizing and piercing means which prevents the wire from shifting as the pointed piercing element enters the same. The point of the piercing element is protected. A long bearing contact surface is provided between the piercing rod and the wire stabilizer. The structure is simplified, durable and economical.

1 Claim, 5 Drawing Figures



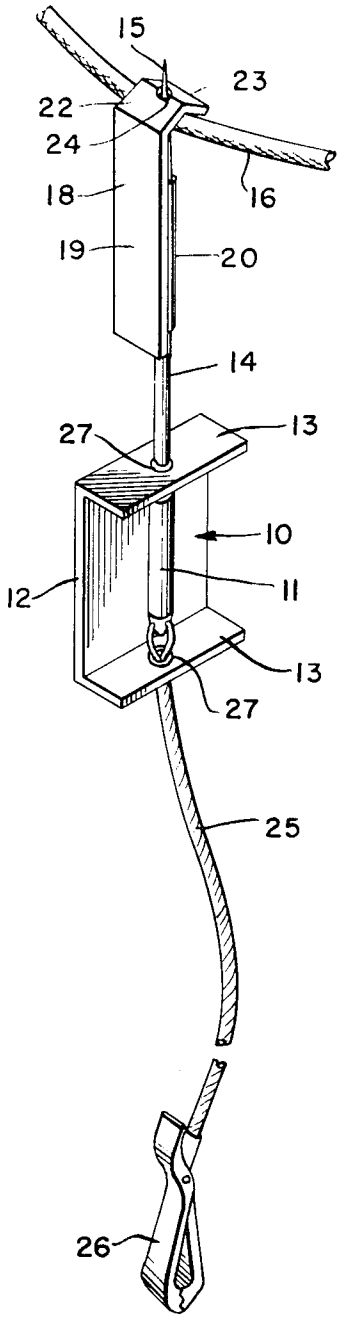


FIG. 1.

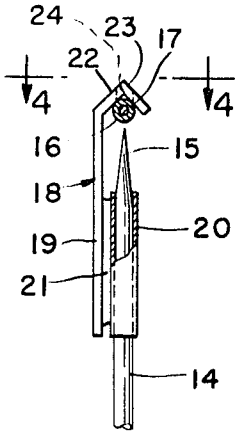


FIG. 2.

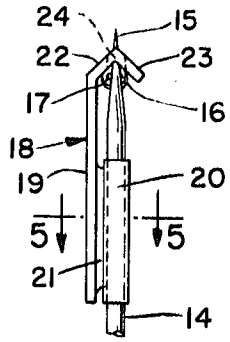


FIG. 3.

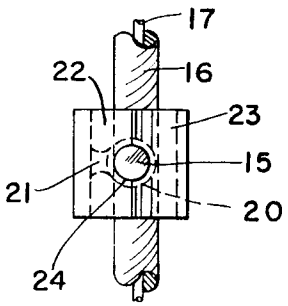


FIG. 4.

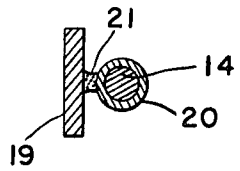


FIG. 5.

INVENTOR
AUGUST A. DAPOLITO
BY A. J. Castorina
ATTORNEY

CIRCUIT CONTINUITY TESTER WITH WIRE INSULATION PIERCING MEANS

Various circuit testers are known in the prior art and some examples of the prior art are shown in U.S. Pat. Nos. 1,986,414; 2,445,667 and 2,509,653. While these and other prior art structures for similar purposes are capable of performing the desired function of testing the continuity of a circuit, or the like, nevertheless the known devices have certain defects and insufficiencies which detract from their practicality. In general, the known testing devices have tended to be complex and somewhat lacking in durability and they are too expensive to manufacture.

More particularly, in the prior art circuit testers which embody a wire piercing pin or element, adequate means to hold and stabilize the wire as it is being pierced has not been provided, together with means to protect the piercing point from blunting. These and other difficulties have been recognized in the art, and it is the object of this invention to provide a tester of the mentioned character which is completely practical and easy to operate, very economical to manufacture, and very rugged and durable and of simplified construction.

BRIEF DESCRIPTION OF DRAWING FIGURES

FIG. 1 is a perspective view of a circuit continuity tester embodying the invention and showing the use thereof.

FIG. 2 is a central vertical section through the wire stabilizing element, guide bearing and associated parts, the piercing point being in the inactive position.

FIG. 3 is a similar view showing the piercing point actively piercing a wire while the latter is seated in the stabilizing element.

FIG. 4 is an end elevational view taken on line 4—4 of FIG. 2.

FIG. 5 is a transverse section taken on line 5—5 of FIG. 3.

DETAILED DESCRIPTION

Referring to the drawings in detail, the numeral **10** designates a sturdy body portion and handle which also serves as a protector for an indicator light bulb **11** mounted therein. The body portion **10** may be conveniently formed from a short section of channel bar, as shown, and the main web **12** of the body portion lies behind and protects the light bulb **11** while the two side webs **13** project forwardly of the bulb and protect it from contact with a table, floor or the like, as where the tester might accidentally be dropped. Also, the open side of the body portion **10** allows the indicator light bulb to be fully exposed to view.

A substantially rigid cylindrical pin or rod **14** projects forwardly of the body portion **10** and is suitably rigidly secured to the same and has a sharply pointed terminal end **15** adapted to penetrate through an insulated wire **16** having a conductor **17** forming a part of a circuit whose continuity is to be tested.

The tester further comprises a coacting wire stabilizing head or element **18** which embodies a flat plate **19** close to one side of the rod **14** and parallel thereto and having a relatively long bearing sleeve **20** affixed to its inner side by welding or the like as indicated at **21**. The welding bead extending between the elements **19** and **20** renders these elements substantially integral and rigid and very durable. The bearing sleeve **20** slidably receives the rod **14** therethrough and provides a large and stable bearing surface between the rod and the stabilizing head **18**.

The head **18** has a forward terminal wire stabilizing portion formed by two converging plate sections **22** and **23** preferably arranged at right angles so as to form a trough or seat of considerable length for a section of the wire **16** being tested. The corner or apex of this trough or seat is immediately opposed to the pointed terminal **15** of the rod and a clearance opening **24** for the pointed terminal is formed through the seat or trough at the center of the same with the trough extending on opposite sides of said opening. The head **18** is freely slidable on the rod **14** and the plate **19** is sufficiently large to be grasped in one hand and drawn toward the body portion **10** to effect the desired piercing of the wire by the terminal **15**, as depicted in FIG. 3. When the piercing operation takes place, the wire cannot shift laterally or escape the piercing point because of the tapered configuration of the stabilizing seat or trough which is engaging the wire **16**;when the pointed terminal **15** engages the wire, the latter is wedged tightly against the seat and the point penetrates through the wire making electrical contact with the insulated conductor **17** and the point **15** emerges behind the trough or seat, as shown in FIG. 3, tightly impaling the wire. The clearance opening **24** avoids dulling or damaging the pointed terminal, as the latter at no time contacts anything but the relatively soft wire. Withdrawal of the point from the wire by a reverse shifting of the head **18** on the rod **14** is a very easy matter.

The previously mentioned indicator light bulb **11** is suitably supported within the channel body portion **10** with its filament electrically connected to the rod **14** and also electrically connected to a grounding cable or wire **25** having a resilient clip **26** on its free end for attachment to any suitable ground. Suitable insulating grommets **27** are provided between the body portion **10**, rod **14** and grounding wire **25**, as shown in FIG. 1.

The use of the tester, in view of the foregoing description, requires no further explanation. However, very briefly, with the clip **26** properly grounded, the wire **16** is engaged within the trough or seat of the stabilizing head **18**, and the head is drawn toward the body portion **10** to cause penetration of the wire by the pointed terminal **15**. If the particular circuit embodying the conductor **14** is a complete circuit, the indicator bulb **11** will glow and so indicate. If a wire is broken or the circuit is incomplete for some other reason, the fault will be detected by the failure of the light bulb to glow.

The invention is characterized by its extreme simplicity and economy, foolproof operation, and the parts are rugged and durable.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or scope of the subjoined claims.

I claim:

1. A circuit continuity tester comprising a body portion comprised of a flat plate having a pair of flanges extending from said plate at the ends thereof, said plate forming a main web and said flanges forming two side webs and cooperating to provide a substantially rigid channel member, a conductive rod projecting from one of the flanges of the channel member outwardly therefrom and having a pointed terminal, a sleeve of substantial length slidable upon the rod, a stabilizing head rigidly secured to the sleeve comprised of a flat plate extending parallel to said sleeve along the length of the sleeve and near one side of said rod and having a forward tapering wire stabilizing seat comprised of two plate sections arranged substantially at right angles defining an apical portion forwardly of and in advance of said sleeve, and said pointed terminal adapted to position a wire being tested said seat having a clearance opening for the pointed terminal formed therethrough at the apical portion, and a light indicator means including an indicator light bulb electrically connected to said conductive rod and anchored between flanges of the channel member and protected and covered by the main web thereof and a grounding cable anchored to the flange opposite said one flange and being in circuit with said bulb.

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