Nov. 8, 1932. L. LUDWIG 1,886,489

ELECTRIC CURRENT TESTER

Filed May 26, 1930

Fig 1

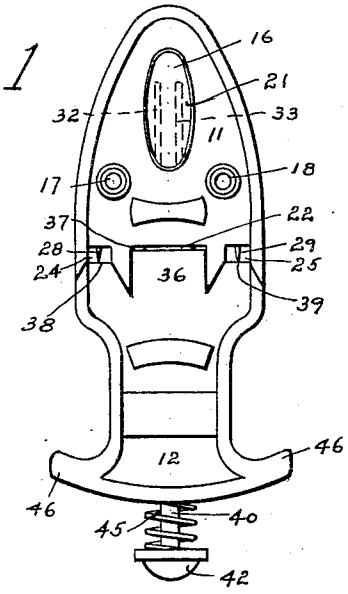


Fig 2

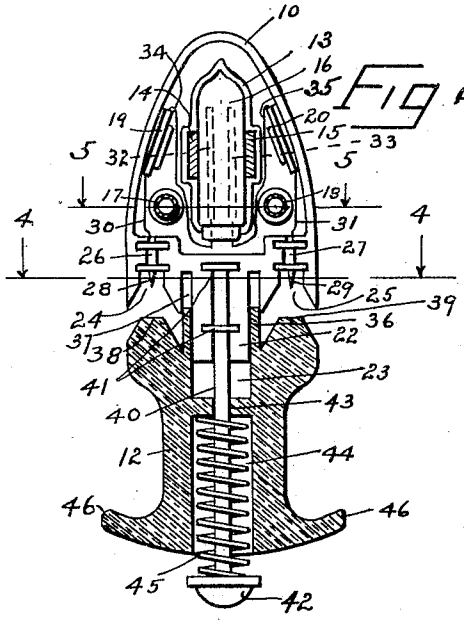


Fig 3

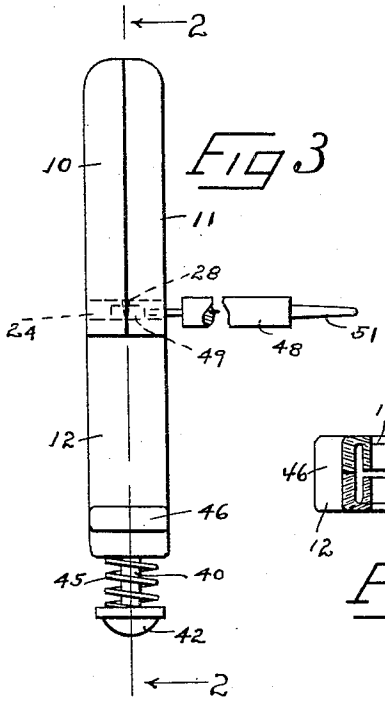


Fig 4

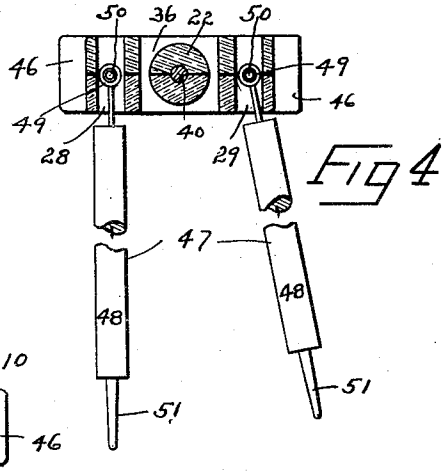
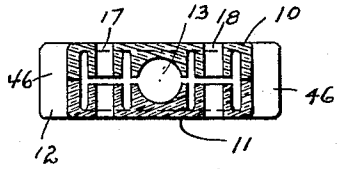


Fig 5



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UNITED STATES PATENT OFFICE

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ELECTRIC CURRENT TESTER

Application filed May 26, 1930. Serial No. 455,753.

The invention relates to instruments for ascertaining if a current is flowing in an electric circuit. It has for one of its objects to provide a device by means of which, not only bare conductors may be tested but insulated wire conductors as well, and by means of which the kind of current may be determined. Another object is to provide a device by means of which the voltage of either a direct or an alternating current, as well as the polarity of a direct current, may be found. A further object is to provide a simple and compact tester, easy and safe to manipulate, and comparatively inexpensive to manufacture.

These and other objects and advantages will be readily understood from the following description and from the accompanying drawing of a preferred embodiment, but it will be understood that various modifications may be made without departing from the scope of the invention. In the drawing

Fig. 1 is a side elevation of the tester,

Fig. 2 a cross-sectional elevation taken on line 2—2 of Fig. 3,

Fig. 3 a side view,

Fig. 4 a cross-sectional view taken on line 4—4 of Fig. 2, and

Fig. 5 a cross-sectional view taken on line 5—5 of Fig. 2.

Referring now to all the views, the device consists of a casing formed of two halves 10 and 11 and a clamping member 12. The two members of the casing are exact duplicates and each consists of a hollow body which is made of insulating material and in which a nest 13 is formed. Adjacent to the inner side edges of this nest two pads 14 and 15 are inserted. They are preferably made of soft rubber and, when the casing is assembled by means of the eyelets 17 and 18, clamp the lamp 16 securely in place.

The lamp employed is what is known as a "neon" lamp, and, as these lamps are usually supplied with resistors, nests are also formed for these resistors 19 and 20 within the casing. Openings, or windows, 21 are formed in both of the casing members and these openings are covered with translucent materials of different degrees of transparency. The reason for using such material will be explained later.

The ends of the casing members which engage with the clamping member 12 are semi-circular and together form a circular stud 22 which fits in a circular hole 23, moulded in the clamping member. Two rectangular grooves 24 and 25 are moulded transversely in the casing. The edges of these grooves are bevelled, as plainly shown in Figs. 1 and 2. A pair of metal pins 26 and 27, which nest in and which are secured by means of flanges to the casing members, have their pointed ends 28 and 29 extending into the grooves 24 and 25. The other ends of these pins are connected to the previously-mentioned resistors by wires 30 and 31, while the resistors are connected to the electrodes 32 and 33 in the lamp by means of wires 34 and 35. It will thus be noted that a current can flow through the pins, the resistors and the lamp electrodes.

The clamping member 12 is provided with a square guide 36 which slides in a slot 37 moulded in the casing. The semi-circular ends which form the stud 22 are located in the center of the slot 37. The stud, as well as the guide 36, serve to properly align the clamping member with the casing. The clamping member is also provided with two clamping faces 38 and 39 which fit in the bevelled parts of the grooves 24 and 25.

A rod 40 is threaded at one end and provided with flanges 41 at its other end. Its flanged end is nested and secured in the casing, while its threaded end, which is provided with a nut 42, extends axially through a hole 43 and a spring chamber 44 formed in the clamping member. A tension spring 45 surrounds the rod and is guided in the spring chamber. Finger grips 46 are formed on the end of the clamping member. When the casing and clamping member are separated as shown in Fig. 2, insulated wires may be inserted in the grooves 24 and 25. When the clamping member is released the tension of the spring 45 will cause the pin points 28 and 29 to pierce the insulation on the wires and thus make electric contact with these.

As it is often necessary to test bare con-

ductors which could not be inserted in the grooves 24 and 25, two test leads 47 are supplied. They are preferably made of flexible wire and insulated by a rubber covering 48. One end of the wire of each of the leads is provided with a small metal disc 49 in which a conical hole 50 is reamed. The other end is provided with a metal tip 51. By inserting the discs 49 in the grooves 24 and 25, so that the pin points 28 and 29 contact in the conical holes 50, the tips 51 are electrically connected with the lamp 16. The leads are firmly held by the clamping member and may be swiveled on the pin points as shown in Fig. 4.

The manner in which the tester is used will now be explained: When the tips 51, or the pins 28 and 29, are applied to a couple of conductors the lamp will light if a current is flowing.

If it is an alternating current both the electrodes 32 and 33 will glow, while if a direct current is flowing only one electrode will glow. Thus, both the kind of current and the polarity of a direct current may be ascertained. It was previously stated that the openings 21 were covered with translucent material of different degrees of transparency. If the lighted lamp is viewed through the opening having the least transparent covering only a relatively high voltage (say 220 volts) will cause the light to show, while through the more transparent material a voltage of 110 volts will cause the light to show. Thus the two most commonly used voltages will be readily shown.

Having described my invention and its uses, what I claim as new and wish to protect by Letters Patent is:

1. In a device of the class described, an insulating casing, a neon lamp contained in said casing, a plurality of openings formed in the said casing through which the lamp may be viewed, said openings covered with translucent materials of different degrees of transparency, a pair of pointed metal pins secured in the casing with their points extending outside thereof, and said pins electrically connected to the lamp.

2. In a device of the class described, an insulating casing, a neon lamp contained in said casing, a plurality of openings formed in the casing through which the lamp may be viewed, said openings covered with translucent materials of different degrees of transparency, a pair of pointed metal pins secured in the casing with their points extending outside thereof, said pins electrically connected to the lamp, and a clamping member coacting with the casing for clamping conductors to be tested against the said pin points.

3. In a device of the class described, an insulating casing, a neon lamp contained in said casing, a plurality of openings formed in the casing through which the lamp may be observed, said openings covered with translucent materials of different degrees of transparency, a pair of pointed metal pins secured in the casing with their points extending outside thereof, said pins electrically connected with the lamp, a clamping member for clamping conductors to be tested against the pin points, and said clamping member being spring-actuated and provided with finger grips.

4. In a device of the class described, an insulating casing, an electric lamp contained in said casing, opening formed in the casing through which the lamp may be observed, a pair of pointed metal pins secured in the casing with their points extending outside thereof, said pins electrically connected to the lamp, a pair of insulated extension leads, each of said extension leads having one end engageable on one of said pin points and the other end suitably shaped for engagement with a conductor, and a clamping device coacting with the casing for securing said leads in proper engagement with the points.

5. In a device of the class described, an insulating casing, a neon lamp contained in said casing, a plurality of openings in the casing through which the lamp may be observed, said openings covered with translucent materials of different degrees of transparency, a pair of pointed metal pins secured in the casing with their points extending outside thereof, said pins electrically connected to the lamp, a pair of flexible and insulated extension leads, each of said leads having one end swivelably engageable on one of said pin points and the other end suitably shaped for engagement with a conductor, and a spring-actuated clamping member coacting with the casing for securing said leads in correct engagement with the points.

LOUIS LUDWIG.