

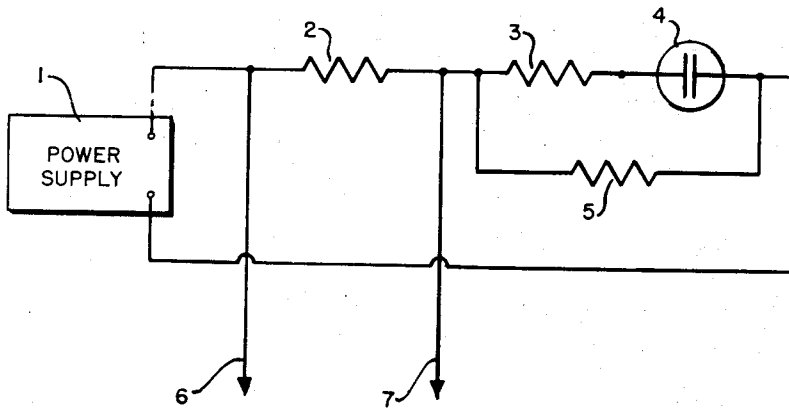
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LOW VOLTAGE NEON SHORTS TESTER

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LOW VOLTAGE NEON SHORTS TESTER

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The invention described herein may be manufactured and used by and for the Government for governmental purposes, without the payment of any royalty thereon.

The present invention relates to a testing device for indicating the existence of a short circuit between elements of an electron discharge device.

In short circuit testing of vacuum tubes it has been customary to employ an indicator lamp of the gaseous discharge type in series with a sufficiently high minimum potential, generally of the order of 75 to 85 volts, and a limiting resistor of sufficient size to prevent damage to the lamp and to the elements under test. The open circuit voltage, which must at least equal the firing voltage of the lamp, is therefore applied to the elements under test. Because a relatively high voltage is applied to the elements under test the conventional series type short circuit indicator has not proven entirely satisfactory.

An object of this invention is to provide an improved short circuit indicating means.

Another object is to provide apparatus arranged to indicate the existence of a short circuit between elements of an electron discharge device which will test for such short circuits without subjecting that device under test to voltages or currents of a magnitude sufficient to damage the device.

These and other objects of the invention will become apparent from the description and claims that follow.

The invention will be more clearly understood by reference to the attached drawing showing a circuit diagram of a short circuit testing circuit according to the invention.

In the drawing, a series circuit consisting of a series resistor 2, a current limiting device such as resistor 3, and a normally extinguished indicator lamp, such as a gaseous discharge lamp or neon lamp 4, is connected between the terminals of a direct or alternating current power supply 1. Limiting resistor 3 and neon lamp 4 are shunted by resistor 5. Each of the two elements of the electron discharge device across which the short circuit test is to be made is respectively connected to one or the other of leads 6 and 7 so that the elements under test are connected in shunt with series resistor 2.

A 75 to 85 volt, alternating or direct current power supply 1 is generally used in operating the equipment. The neon lamp 4 is generally chosen to have a 50 to 60 volt alternating or direct current firing potential. The series resistor 2, lim-

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iting resistor 3, and shunt resistor 5 are so chosen that the voltage division across the network places approximately 50 volts across neon lamp 4 (or slightly less than the firing voltage of neon lamp 4), and approximately 25 volts across load resistor 2 and, subsequently, the elements of the electron discharge device that are connected to leads 6 and 7 for short circuit testing. In the event of a short circuit between the elements under test, resistor 2 is shunted with a relatively low resistance and a larger part of the source voltage is made available across resistor 5 thereby firing and exciting neon lamp 4 and indicating the presence of the short circuit. When an alternating current power source is used it may be desirable to insert a capacitor in the leads 6 or 7 to prevent excitation of lamp 4 due to normal tube conduction on alternate half cycles.

Limiting resistor 3 were required should be sufficiently large, about 250,000 ohms, for the type of neon lamp discussed herein to prevent burning out of the lamp.

Due to the relatively low voltage across the electron discharge device elements under test, the test is non-destructive. Also, the circuit herein disclosed is particularly useful for testing miniature type tubes or tubes having closely spaced elements. When the elements under test are spaced close together, and the conventional series short circuit indicator is utilized, a relatively high voltage is placed across the elements and an erroneous short circuit indication may result due to the electrostatic potential built up across the elements. This problem is, for all practical purposes, eliminated when the low voltage test circuit herein disclosed is utilized.

As many apparently widely different embodiments of the invention may be made without departing from the spirit and scope hereof, it is to be understood that the invention is not limited to its specific embodiments except as defined in the appended claims.

What is claimed is:

1. In an apparatus for testing an electron discharge device or the like which comprises a plurality of elements: a source of voltage with two terminals, a series resistor, and a normally extinguished indicator lamp connected in series between said terminals; a resistor connected in shunt across said indicator lamp; and means for connecting two selected elements of said device in shunt across said series resistor whereby said lamp is excited by a short circuit between said two elements.

2. In an apparatus for testing an electron dis-

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charge device or the like which comprises a plurality of elements: a source of voltage with two terminals, a series resistor, a current limiting resistor, and a normally extinguished gaseous discharge lamp connected in series between said terminals; a resistor connected in shunt across said current limiting resistor and said indicator lamp; and means for connecting two selected elements of said device in shunt across said load resistor whereby said lamp is excited by a short circuit between said two elements.

3. In an apparatus for testing an electron discharge device or the like which comprises a plu-

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ality of elements: a source of voltage with two terminals; a series resistor, a current limiting resistor, and a normally extinguished neon lamp connected in series between said terminals; a resistor connected in shunt across said current limiting resistor and said neon lamp; and means for connecting two selected elements of said device in shunt across said series resistor whereby said lamp is excited by a short circuit between said two elements.

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No references cited.