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L. S. BAKER

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PROCESS OF MANUFACTURING ELECTRONIC DEVICES

Filed Nov. 9, 1925

Fig. 1.

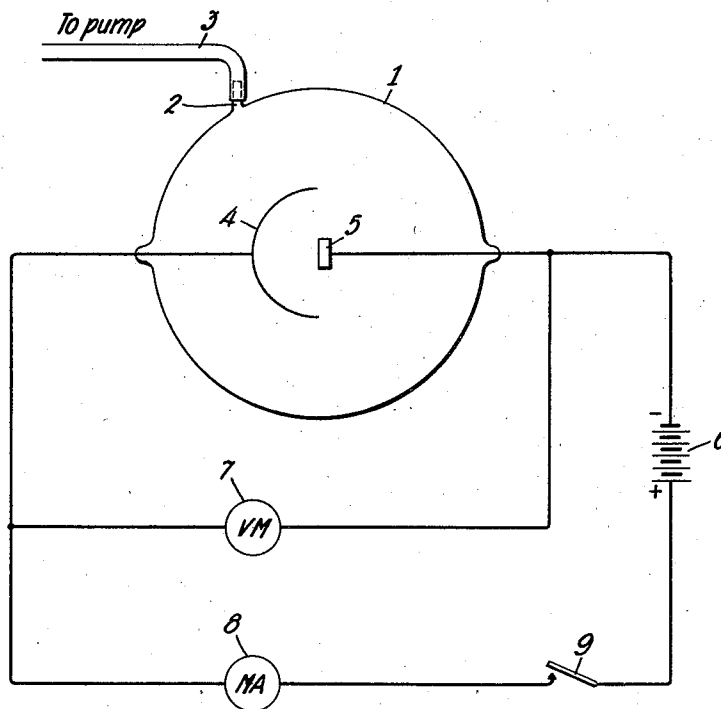
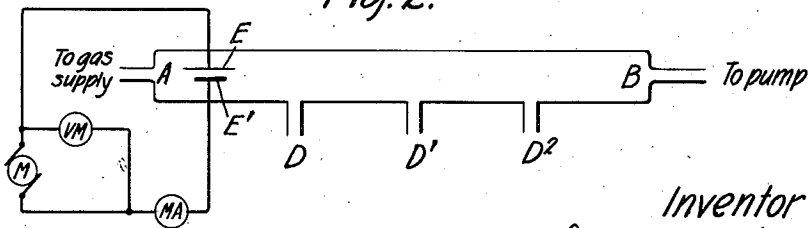


Fig. 2.



Inventor
L. S. Baker
by *Panich*
his Att'y

UNITED STATES PATENT OFFICE.

LEWIS S. BAKER, OF OSSINING, NEW YORK, ASSIGNOR TO MANHATTAN ELECTRICAL SUPPLY COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF MASSACHUSETTS.

PROCESS OF MANUFACTURING ELECTRONIC DEVICES.

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This invention relates to new and useful improvements in the manufacture of electronic devices, and particularly to an improved and inexpensive method of determining the gas or air pressure existing in such devices.

In accordance with the present invention, the degree of evacuation of or the gas pressure in the airtight envelope of an electronic or thermionic device is determined by applying an electric current of a given potential to the electrodes contained in the envelope, and then reading off a milliammeter the current passing through a circuit including said electrodes. Depending on the density of the gas in the envelope, the amount of current flowing through said circuit will vary.

The relative variations in pressure and current flow may be empirically determined, but I have found that by properly proportioning the electrode areas, and regulating the applied potential, I can, within certain range, obtain a direct reading in milliamperes of the pressure in millimeters within the envelope, i. e., 8 milliamperes indicates a pressure of 8 millimeters. To those skilled in the art the economical value of the above scheme, especially when working with the Noble gases, over that of the present vacuum gauges, will be apparent.

The manner in which the present method may be practiced is schematically illustrated in the drawings.

In Fig. 1 a glass bulb 1 is connected at 2 with a pump through hose 3. Two electrodes 4 and 5 in the bulb are connected in a circuit including a source of direct current 6 and a milliammeter 8. The circuit may be opened and closed by means of a switch 9. The potential of the current flowing through the circuit is indicated by the voltmeter 7 connected in parallel.

In Fig. 2 A—B is a manifold with which bulbs may be connected at outlets D, D¹ and D². E and E¹ are electrodes within the manifold which are connected in series with a milliammeter MA and a source of direct current M. A voltmeter VM is provided in a parallel branch of the circuit. The milliammeter will indicate the gas pressure existing in the manifold.

The present arrangement affords a simple and quick method of determining gas pressures during the manufacture of electronic tubes, the apparatus used being inexpensive and readily available.

What I claim is:

1. The method of determining the gas pressure in the envelope of an electronic device which comprises applying current to the electrodes at such voltage that the current passed by the electrodes in milliamperes, equals the pressure of the gas in millimeters, and measuring the current passed by the tube in milliamperes.

2. The method of determining the gas pressure in the envelope of an electronic device having electrodes therein, which comprises applying a current to the electrodes and so regulating the voltage of the applied current that the number of milliamperes passed by the electrodes equals the number of millimeters gas pressure in the envelope.

3. The method of determining the gas pressure within an exhaust manifold containing electrodes, having a source of current and a series milliammeter connected therewith, during the exhausting and filling of the manifold, which comprises adjusting the voltage of the current source to such a value that the scale reading of the milliammeter in the electrode circuit is equal to the number of millimeters gas pressure in the manifold.

4. The method of determining the gas pressure in the envelope of an electronic device by means of a source of current of adjustable potential, a current indicating device and two electrodes within the envelope, all connected in series, which consists in so correlating the area of the electrodes to the applied potential that the reading of the current indicating device in milliamperes is equal to the pressure of the gas in millimeters, applying a potential and reading the gas pressure directly off the current indicating device.

In testimony whereof, I have signed my name to this specification, this 4th day of November, 1925.

LEWIS S. BAKER.