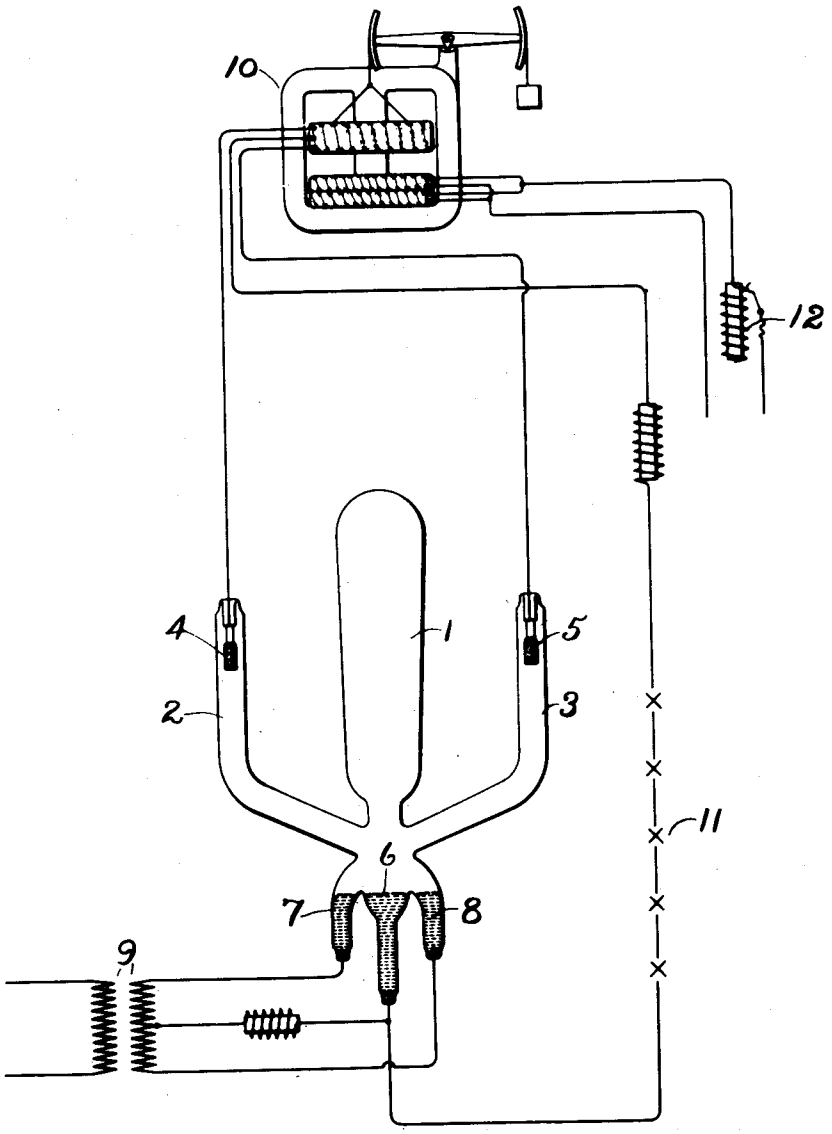
No. 866,011. PATENTED SEPT. 17, 1907.

S. FERGUSON.

METHOD OF IMPROVING VAPOR ELECTRIC DEVICES.

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METHOD OF IMPROVING VAPOR ELECTRIC DEVICES.

No. 866,011. Specification of Letters Patent. Patented Sept. 17, 1907.

Application filed February 9, 1907. Serial No. 356,555.

To all whom it may concern:

Be it known that I, SAMUEL FERGUSON, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Methods of Improving Vapor Electric Devices, of which the following is a specification.

This invention relates to vapor electric apparatus, and consists of a method of treating such apparatus to render it more reliable when used on high voltage circuits.

When vapor electric devices, such as mercury rectifiers, are operated on high voltage circuits, the voltage strain between one anode and another, or between the mercury cathode and an anode, is very high and the liability of break down by reverse current or by arcing between anodes is much greater than with rectifiers operating on low voltage.

I have found that when a vapor rectifier has been transported from one place to another there is likely to be a small quantity of mercury on or about the anodes of the tube. I have also found that if this mercury is not removed before the vapor device is put in operation on high voltage, it may cause deterioration or even destruction of the device.

My present invention comprises a treatment for the vapor device whereby dangers from the above mentioned source are obviated.

The accompanying drawing illustrates a mercury vapor rectifier installed on a high voltage series circuit.

The rectifier tube consists of a central chamber 1 and side arms 2 and 3, provided respectively with carbon anodes 4 and 5. These anodes are mounted near the ends of the arms and are out of the direct path of the vapor blast emanating from the mercury cathode 6.

The vapor device is provided with the usual auxiliary or maintaining anodes 7 and 8 supplied with energy from a suitable transformer 9.

The main source of current for the rectifier consists of a constant current transformer 10 of usual form, receiving energy from constant potential mains.

The load circuit of the rectifier may consist of a series of arc lamps 11; as many as 75 arc lamps may be arranged in the load.

After the rectifier tube has been shipped to its destination, and installed as shown diagrammatically in the drawing, but before being put into actual operation, I run the rectifier at about normal current on a short circuit, or on a low load, for a time long enough to distil off any mercury which may have collected around or in the anodes during shipment. The normal current heats the anodes sufficiently to distil all mercury from them, or from the spaces immediately adjacent, and the low voltage used for this treatment is small enough to avoid any danger to the tube, even though mercury be present at the beginning of the operation. To secure this low voltage I may introduce a reactance 12 in the primary of the constant transformer, or I may connect the two primaries of the transformer in series, or I may resort to any convenient means for obtaining a current supply of moderately low voltage. The above described treatment is not only applicable to rectifier tubes which have been shipped or handled, but it may also with advantage be applied to rectifiers which have been out of service for even a short time. The method may be applied every night or after each shut down by running the rectifier for a few minutes on short circuit immediately before the rectifier is cut in on its full load. Such treatment obviates danger from mercury deposited on or about the anodes by the action of sunlight on the tube, or by condensations in the anode arms when the weather is very cold, etc.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. The method of improving the reliability of a vapor electric device for operation on a high voltage circuit, which consists in treating the rectifier with a relatively low voltage current to distil from the anodes any mercury which may have accumulated there accidentally.

2. The method of removing mercury from the anodes of a constant current vapor rectifier, which consists in passing substantially normal current through the rectifier at a voltage materially lower than the normal operating voltage.

3. The method of relieving a mercury vapor rectifier from the dangers arising from mercury around or in the anodes, which consists in initially operating the rectifier on a low voltage current and distilling the mercury from the neighborhood of the anodes before the rectifier is put in service on high voltage.

4. The method which consists in initially operating a vapor rectifier at small load, and, after accidental accumulations of vaporizable material are removed, operating said vapor device under normal conditions.

In witness whereof, I have hereunto set my hand this 6th day of February, 1907.

SAMUEL FERGUSON.

Witnesses:

BENJAMIN B. HULL,

HELEN ORFORD.