

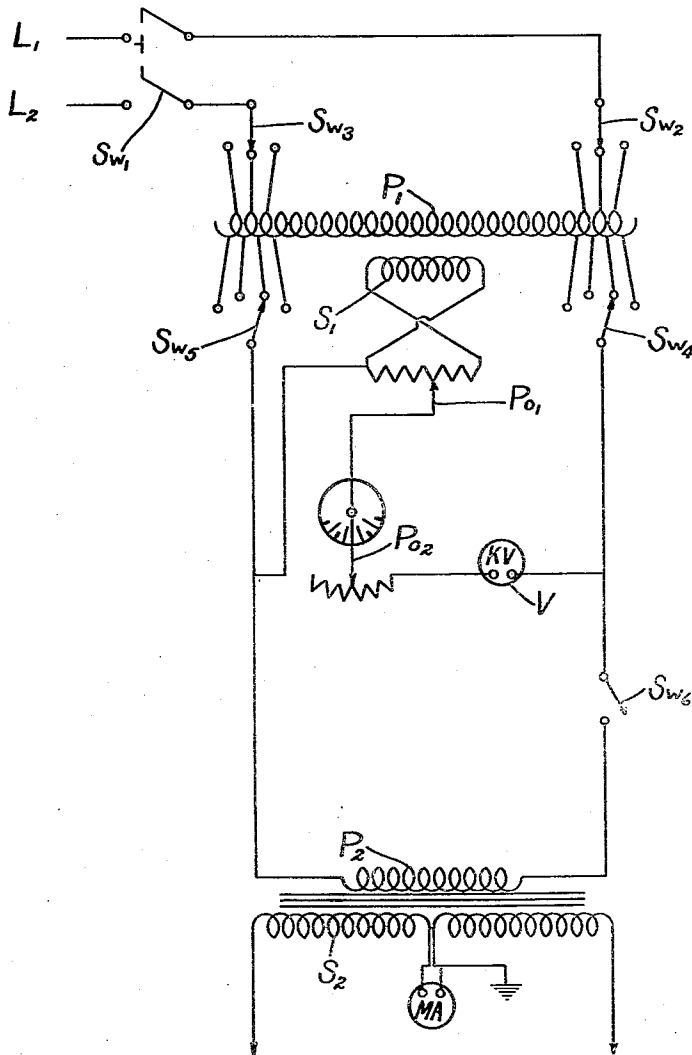
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VOLTAGE CONTROL MEANS FOR X-RAY APPARATUS

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VOLTAGE CONTROL MEANS FOR X-RAY APPARATUS

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2 Claims. (Cl. 250—93)

This invention relates to X-ray apparatus and more particularly to the control means for the voltage applied to the X-ray tube.

The object of the invention is to provide improved control means for accurately determining and indicating in advance of closure of the exposure switch, the kilovoltage to be applied to the tube, thereby eliminating any necessity of calculations or of readings from charts, as heretofore has been necessary in the art.

In the drawing the view shown illustrates diagrammatically one arrangement of apparatus embodying the invention.

L_1 , L_2 represent the line which supplies current through the line switch Sw_1 and major and minor line adjuster switches Sw_2 , Sw_3 to an autotransformer P_1 which is conventionally connected through major and minor voltage selector switches Sw_4 , Sw_5 , and by way of the exposure switch Sw_6 , to the primary P_2 of a high tension transformer, whose secondary S_2 supplies current for the plate circuit of the X-ray tube, as is usual.

V represents the usual voltmeter, calibrated in kilovolts, across the autotransformer to indicate the voltage applied to the primary of the high tension transformer which energizes the X-ray tube.

Also associated with the autotransformer is an insulated secondary winding S_1 connected to a potentiometer Po_1 which in turn has its output circuit connected to a second potentiometer Po_2 . The latter is so connected in series with the voltmeter V that the voltage supplied by winding S_1 and developed across potentiometer Po_2 is 180° out of phase with the voltage which is to be applied to the primary P_2 of the high tension transformer. Bucking voltage is therefore produced in potentiometer Po_2 .

The potentiometer Po_1 is adjustable and is set by the one who installs the apparatus, in accordance with and to meet the voltage drop characteristic of the particular supply line L_1L_2 to which the apparatus is connected and through the apparatus to the X-ray tube.

The potentiometer Po_2 , however, is adjustable for the purpose of supplying a sufficient correction to the circuit and to voltmeter V so that said voltmeter may be calibrated in kilovolts and indicate accurately the voltage applied to the high tension transformer or to the X-ray tube after the exposure switch is closed. Accordingly, potentiometer Po_2 has a dial calibrated in milliamperes in such manner that setting it to any desired value, say 50 milliamperes, will introduce the

proper correction into the circuit so that the voltmeter V will read accurately at that milliamperage.

The apparatus is used as follows:

Assuming the exposure switch Sw_6 to be open, line switch Sw_1 is closed, potentiometer Po_2 is adjusted to the desired amperage, say 50 milliamperes, and the major and minor voltage selector switches Sw_4 and Sw_5 are adjusted to those positions which produce accurately the desired voltage reading, say 30 kilovolts, on voltmeter V . When these various adjustments have been accomplished, the operator is certain that upon closure of the exposure switch Sw_6 current will be supplied to the high tension transformer and by it to the X-ray tube at the desired voltage and amperage. No reference to tables and no calculations are necessary.

Other advantages of the invention will be apparent to those skilled in the art.

What I claim is:

1. X-ray control apparatus of the character described, comprising a transformer adapted for connection to a line and provided with means for varying its output voltage, a high tension transformer energized thereby and adapted to supply current for the X-ray tube, an indicator for said output voltage, an adjustable resistance in circuit with said voltage indicator, a winding on said line transformer arranged to supply bucking voltage to said resistance independently of the voltage supplied to the high tension transformer, means for varying said bucking voltage to compensate for line voltage drop, said resistance being calibrated in terms of current and being adapted to insure accuracy of said voltage indicator at each current value.

2. X-ray control apparatus of the character described, comprising a transformer adapted for connection to a line and provided with means for varying its output voltage, a high tension transformer energized thereby and adapted to supply current for the X-ray tube, an indicator for said output voltage, and adjustable compensating means calibrated in terms of current and in circuit with said voltage indicator, said line transformer being provided with means for supplying voltage to said compensating means independently of the high tension transformer connections to said line transformer, and said compensating means being adapted to insure accuracy of said voltage indicator for each position of said compensating means.

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