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REGULATING SYSTEM FOR TRANSFORMERS

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Fig. 1.

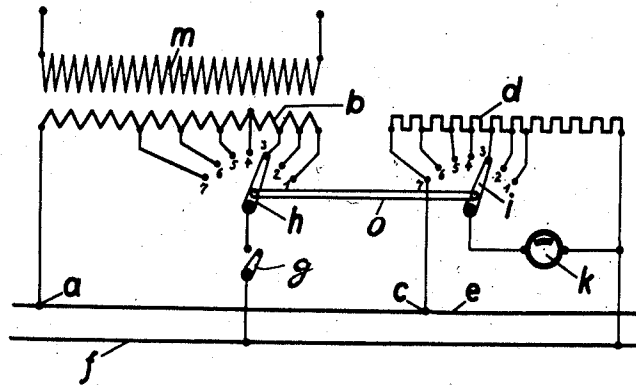
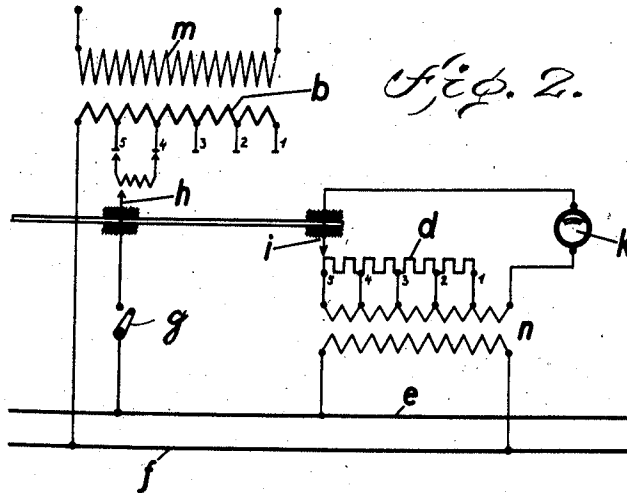


Fig. 2.



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REGULATING SYSTEM FOR TRANSFORMERS

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This invention relates to improvements in transformers and has particular reference to a potential regulating system for transformers, especially used in X-ray works.

In high tension transformers, and particularly those used for the generation of X-rays, it is frequently desirable to be able to set the potential at a predetermined value without first putting the transformer into operation.

According to the present invention, the attainment of the above result is accomplished in a highly simple and practical manner by the utilization of a voltmeter in series with a variable resistance, the adjustable control element of which is connected directly to that of the subdivided primary winding of the transformer.

The inventive idea involved is capable of receiving a variety of expressions, some of which are shown in the accompanying drawings wherein:—

Figs. 1 and 2 are diagrammatic views of two different embodiments of the invention. By reference to Fig. 1, it will be seen that the primary winding *b* is subdivided at various points which are connected to terminals numbered from 1 to 7, each adapted to be engaged by an adjustable control element such as the wiper *h*. One terminal of said primary winding is connected at point *a*, to the conductor *e* of the current supply while the wiper *h* is joined to the conductor *f* through the switch *g*.

A variable resistance *d* (ohmic or inductive) is bridged across the conductors *e* and *f*, one terminal being connected at *c* to conductor *e*. From the opposite terminal of the resistance toward the first named terminal, the same is tapped at points 1 to 7, which are in the same direction and in parallel with the terminals 1 to 7 of the primary winding *b*. A wiper *i* engages the terminals 1 to 7 and has in series therewith the voltmeter *k* which, together with said wiper, is in parallel with the line connecting the conductor *f* with that end of the resistance adjacent the terminal 1. The two wipers *h* and *i* are directly connected by the link *o* so that motion is transmitted from one to the other of

said wipers to set the same on corresponding terminals of the winding *b* and resistance *d* to regulate the latter.

If the voltmeter *k* is so calibrated that it indicates the terminal voltage (which is dependent solely upon the ratio of transformation of the transformer) of the secondary winding *m*, then the terminal voltage of said secondary winding *m* may be set on the voltmeter *k* before putting the transformer into operation through the medium of the switch *g*.

In accordance with Fig. 2, the windings *b*, *m*, of the transformer and the resistance *d* may, in a known manner, be made to be continuously variable. Also the meter *k* may be indirectly connected to the power conductors *e*, *f* as by means of a transformer *n* which controls the deflections of the meter *k* in the event of alterations in the positions of the control elements *h*, *i*.

What is claimed is:

1. In a transformer especially employed in X-ray apparatus and including a subdivided primary winding, power conductors to one of which is connected one terminal of said winding, a plurality of other terminals for said winding designating the subdivisions thereof, a control element for connecting any one of said other terminals to the other of said conductors, a variable resistance connected to said conductors and including a plurality of terminals correspondingly arranged relative to said other terminals of the primary winding, a second control element for the second mentioned group of terminals, a volt-meter bridging said power conductors in series with said second control member and said resistance and means connecting said control elements for effecting unitary operation between the same.
2. In a transformer especially employed in X-ray apparatus and including a subdivided primary winding, power conductors to one of which is connected one terminal of said winding, a plurality of other terminals for said winding designating the subdivisions thereof, a control element for connecting any one of said other terminals to the other of said conductors, a variable resistance con-

5 nected to said conductors and including a
plurality of terminals correspondingly ar-
ranged relative to said other terminals of
the primary winding, a second control ele-
ment for the second mentioned group of
terminals, a volt-meter bridging said power
conductors in series with said second control
member and said resistance, means connect-
ing said control elements for effecting uni-
10 tary operation between the same, and a
switch for controlling the connection of the
first named control element to the second
named conductor.

3. In a transformer especially employed
15 in X-ray apparatus and including a sub-
divided primary winding, power conductors
to one of which is connected one terminal
of said winding, a plurality of other termi-
nals for said winding designating the sub-
20 divisions thereof, a control element for con-
necting any one of said other terminals to
the other of said conductors, a transformer
having one of its windings connected with
said conductors, the other winding being sub-
25 divided and comprising a plurality of termi-
nals arranged correspondingly to the first-
mentioned plurality of terminals, a sub-
divided resistance having a plurality of
terminals connected with the second-men-
30 tioned plurality of terminals, a second con-
trol element for the second-mentioned plu-
rality of terminals, a voltmeter in series with
said second control element and said sub-
divided winding of the second-mentioned
35 transformer, and means connecting said con-
trol elements for effecting unitary operation
between the same.

4. In a high tension transformer especially
used in X-ray apparatus and having a sub-
40 divided primary winding, power conductors
to one of which one terminal of said winding
is connected, an adjustable device including
a control element for said winding, said con-
trol element being connected with the other
45 of said conductors, a calibrated meter also
connected to said terminals through said
power conductors for measuring the second-
ary potential of the transformer, a second
control element for said meter, said second
50 control element being connected to the first
named control element, whereby there is ef-
fected such a regulation that indications on
said meter are made dependent thereupon in
a manner wherein they vary proportionally
55 with the voltage that is to be measured.

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