July 16, 1935. H. D. GARRETSON 2,008,496

INVERSE SUPPRESSOR FOR X-RAY SYSTEMS

Filed April 21, 1934

Fig. 1.

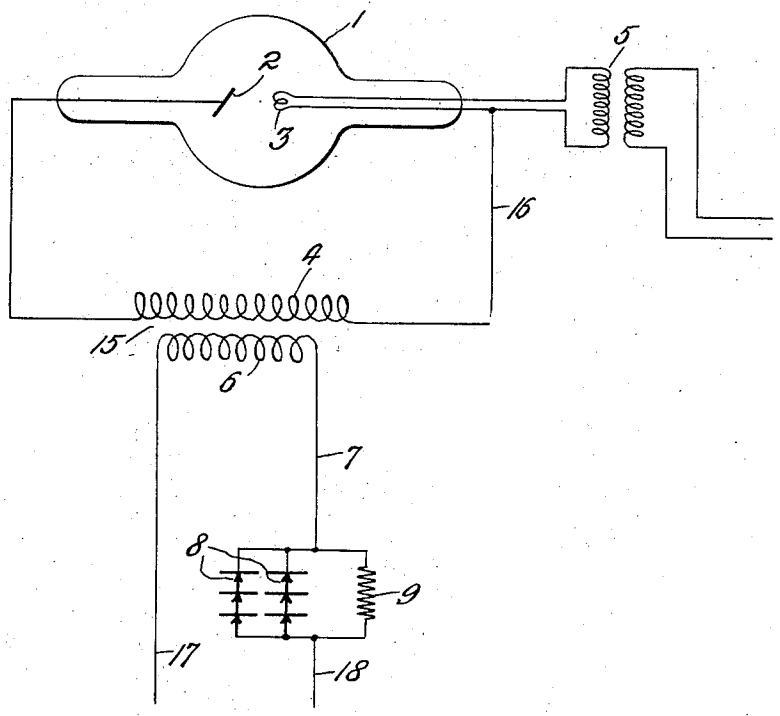
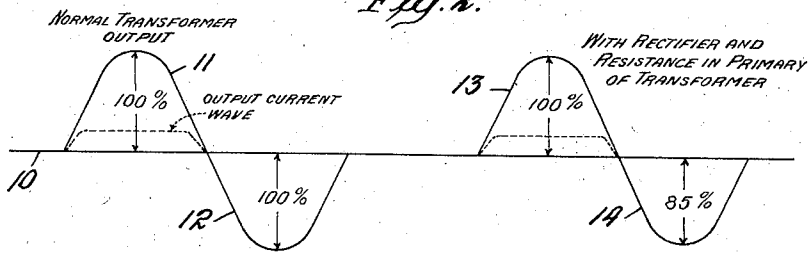


Fig. 2.



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INVERSE SUPPRESSOR FOR X-RAY SYSTEMS

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Application April 21, 1934, Serial No. 721,661

1 Claim. (Cl. 250—34)

This invention relates to an inverse suppressor for X-ray systems and has for its object to provide a simple, reliable and effective suppressor means of this character.

More specifically, the invention contemplates the utilization of a resistance connected in parallel with a dry rectifier, the rectifier and resistance being connected to the primary of the conventional high tension transformer used in X-ray systems.

In the accompanying drawing wherein an embodiment of the invention is shown, Fig. 1 is a diagram illustrating the location of the dry rectifier and resistance in the X-ray circuit; and Fig. 2 is a diagram illustrating the reduction in the wave attained by the use of the improved suppressor.

In the accompanying drawing, 1 illustrates a conventional X-ray tube of the hot cathode type having a filament 3 which is connected to the filament transformer 5 in the usual way. The tube is provided with the conventional anode 2 which is connected to the secondary 4 of the high tension transformer 15. The opposite end of the secondary is connected by the wire 16 to the filament 3 in the conventional manner illustrated.

At 6 is idicated the primary winding of the high tension transformer 15, one end 7 of said primary being connected to several dry rectifiers 8 which are connected in parallel with a resistance 9. The wires 17 and 18 are connected to a suitable source of current.

The effect of this rectifying circuit located in the primary of the high tension transformer is clearly illustrated in Fig. 2. At the left of said figure is the conventional transformer potential as it appears without the use of the rectifiers 8 and resistance 9 in the primary. At the right is shown the effect attained through the use of the rectifiers and resistance. It will be seen in the curve shown at the left of the figure that the wave 11 above and that indicated at 12 below the neutral line 10, is of equal curvature. At the right of the figure, it will be seen that the upper wave 13 corresponds to that shown at 11, while the lower wave 14 has been materially reduced, or approximately to 85% of the wave 12, as shown in the left portion of the figure.

The reason for this inverse suppression or rather partial suppression is as follows: The X-ray tube acts as its own rectifier permitting current to flow for a half cycle only, that is, when the anode is positive. The dry rectifier in the primary circuit is so connected that current flows freely during this half cycle, but is checked and must flow through the resistance during the other half cycle. This resistance is chosen of such a value as to materially lower the primary charging current flow and consequently the potential in the primary at this period.

The use of the dry rectifiers and resistance in parallel with the rectifiers, for this purpose have been found to be of long life and entirely satisfactory in result.

What I claim is:

A non-resonant inverse-reducing means for X-ray systems comprising, a hot cathode X-ray tube, a high tension transformer having primary and secondary windings, the secondary winding being connected to the tube, a dry rectifier being connected to one end of the primary winding, and a resistance in parallel with the rectifier, said means constituting a circuit the stable operation of which is not dependent upon resonance and which causes no change in the normal form of the primary wave.

HARRY D. GARRETSON.