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CATHODE RAY SCANNING DEVICE

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Fig. 1

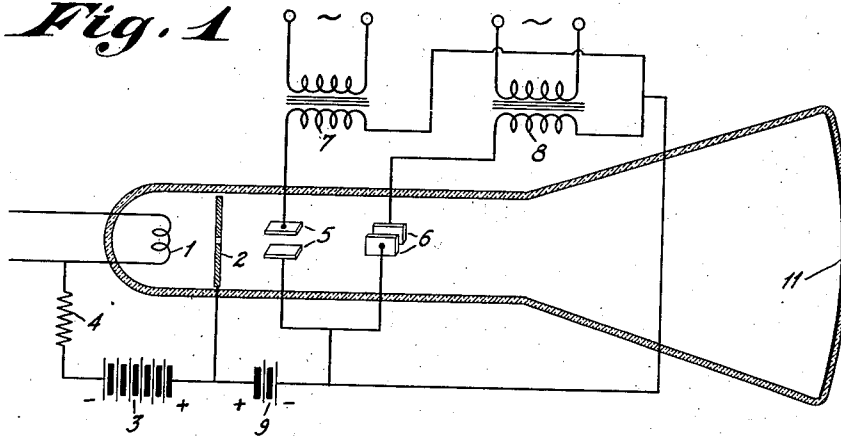
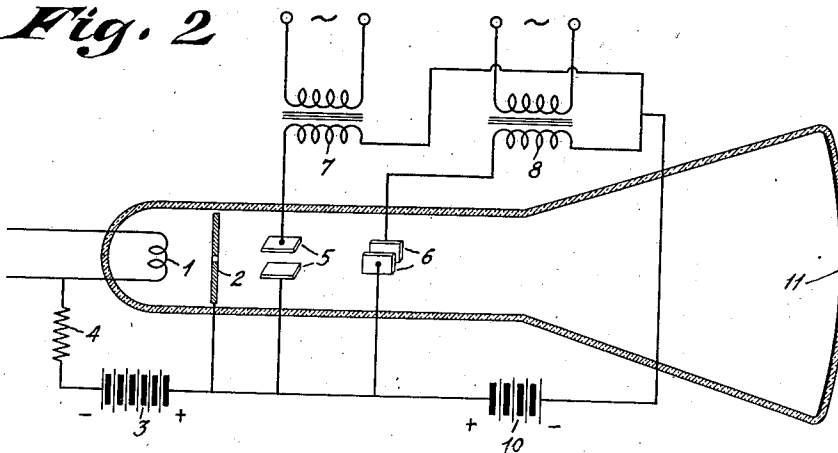


Fig. 2



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CATHODE RAY SCANNING DEVICE

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1 Claim. (Cl. 250—27)

The present invention relates to a scanning device and particularly to a circuit arrangement for the operation of a Braun cathode-ray tube.

The use of Braun cathode-ray tubes for the recording of rapidly varying alternating potential actions and for picture scanning and re-creation in television apparatus is well known in the earlier art.

Deflection of the cathode-ray pencil within the tube is effected in practice almost exclusively by the agency of two pairs of deflector electrodes or plates. Each set of plates or electrodes is arranged at right angles to each other and usually mounted interiorly of the tube in proximity to the anode. The circuit arrangement for the deflector plates or sheets is usually chosen of such form that one of the two sheets is connected directly with the anode of the tube, whereas the alternating potentials intended for causing deflecting actions of the cathode-ray pencil are caused to operate between the plates of each pair. In addition, the tube anode is often grounded.

It has been found that in this conventional circuit arrangement instabilities of the control action are produced and that, more particularly, the amount of the resultant deflections of the cathode-ray pencil or radiations are frequently disproportionately small. It is probable that this action is due to the fact that part of the electrons that have travelled through the anode are diffused out of the cathode-ray pencil and that these freed electrons are then able to reach the deflector sheets if these have a charge positive in reference to the anode.

The potential amplitudes serving for the production of the deflector effect in the presence of such conditions may be compensated wholly or partly. A case of the kind as here described may easily arise when the alternating potential source serving for the production of the control action presents a high internal resistance.

Practical experiments have shown that perfect quantitative and stable control of the cathode-ray or electron pencil is securable if care is taken so that the potential of the control or deflecting electrodes or plates remains negative compared with respect to the potential applied to the tube anode, or, at least, so that the deflecting plates never attain a positive value with respect to the tube anode.

Certain ways and means relative to the circuit here used and adapted to this end constitute the object of the invention and for the purpose of further explanation two exemplified embodiments are illustrated in the accompanying drawing, wherein Figure 1 is a diagrammatic view of cathode ray apparatus embodying my invention, and

Fig. 2 is a view similar to Fig. 1 showing a modification.

Referring to the drawing for a further description of the invention, the numeral 1 denotes the cathode of the cathode ray tube, 2 represents the anode which for the sake of example consists here of a perforated plate. Between the cathode 1 and anode 2 there may be, where desired, a control electrode to vary, in accordance with the potential applied to this electrode, the intensity of the electron stream within the tube, as shown, for example, by the United States patent to Nicolson #1,470,696. Numeral 3 represents the tube anode potential source; 4 a limiting resistance, while numerals 5 and 6 designate the two pairs of ray-deflection control electrodes.

In the case of Fig. 1, one sheet or plate out of each pair of deflector electrodes is united with the negative pole of a biasing potential battery 9 which has its positive pole associated with the plate or anode of the cathode-ray tube. The control potentials for producing deflection of the cathode-ray pencil are fed to the deflector sheets or plates 5 and 6 in this instance by way of two transformers 7 and 8 connected with any suitable source. 25

In the case of Fig. 2, one plate out of each of the two pairs of deflecting electrodes 5 and 6 is at anode potential. The biasing battery 10 is disposed in series with the transformer windings 7 and 8, respectively, and the potential thereof is so chosen that also in the course of the deflection control action no potentials positive in reference to the anode will be liable to arise at the plates not connected with the anode.

The controlled cathode ray is observable in the usual manner upon the fluorescent end wall 11 of the tube.

Having now described the invention, I claim:—

In a system for electro-optically reproducing transient effects, a cathode ray tube having a fluorescent viewing screen, a source of electrons and an anode which upon the application of voltage thereto causes the electrons developed at the source to be projected toward said screen to produce fluorescent effects thereon, a plurality of pairs of deflecting elements located intermediate the electron source and the screen for causing upon the application of suitable deflecting voltages thereupon the electron beam developed to traverse the fluorescent screen according to pre-established patterns of traversal, and means to maintain a permanent biasing voltage upon at least one of each pair of deflecting elements of a value negative with respect to the voltage applied to the anode during operation to prevent the collection of electrons of the beam upon the said deflecting elements.

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