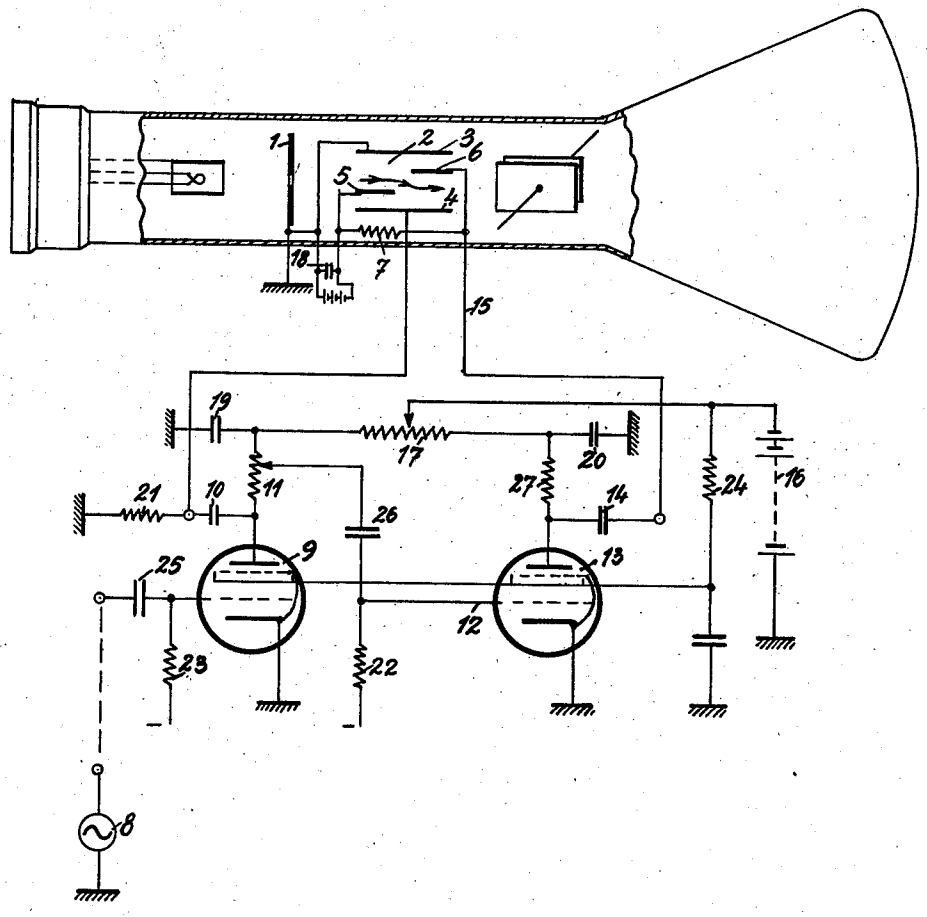
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BRAUN TUBE

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BRAUN TUBE

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5 Claims. (Cl. 250—27.5)

In the application Serial No. 694,915 filed October 23rd., 1933 there is described a Braun tube for television purposes, the deflecting systems of which consist of three plates. In this arrangement the ray enters the space between the upper and the middle plate, is then diverted through a slot provided in the positively biased middle plate into the space between the middle plate and the lower plate, and then leaves this space, in the state of rest, parallel to the direction of its entry. The deflection takes place after the diversion of the ray into the space between the middle plate and the lower plate. In this arrangement the middle plate is linked up with a constant potential, whilst the full deflection potential is applied to the lower deflecting plate. In this arrangement considerable potenials (of the order of approximately 400 volts) are required for control over the full range.

The subject matter of the invention is an additional development of the arrangement described in the main patent enabling considerably lower deflecting potenials to be employed.

According to the invention, the middle plate is divided into two completely independent parts, each of which have the same potential on D. C. lines (positive in relation to the two outer plates). The deflecting potentials is conducted simultaneously in counter-cadence to the one outer plate and to the part of the middle plate directed towards the luminous screen.

In this manner it is possible to perform full-range control in the tube with half the potential otherwise required.

A form of embodiment of the invention is illustrated by way of example in the single figure of the drawing.

In the same 1 is the anode of the Braun tube, 2 a deflecting plate system with the two outer plates 3 and 4 and the inner plate comprising the two parts 5 and 6. The plates 3 and 4 are linked up with anode potential (earth) whilst the middle plate is positively biased to such extent in relation to the plates 3 and 4 that the ray entering the space between the plates 3 and 5 is diverted into the space between the plates 4 and 6, and emerges from the same in its state of rest parallel to the direction of its entry but displaced in relation thereto to the extent of a few millimetres. The plates 5 and 6 are connected with each other through the medium of the highly ohmic resistance 7 of approximately 10^6 ohms and are accordingly linked up with equal direct current biases, whilst as regards alternating current the same possess different potentials.

The deflecting potential proceeding from the generator 8 is conducted, after amplification in the amplifier tube, preferably pentode 9, over the condenser 10 to the lower deflecting plate 4. Connected with the anode resistance 11 of the pentode is the control grid 12 of the phase-reversing tube 13, which preferably is also in the form of a pentode. The deflecting potential of reverse phase produced in this fashion is conducted over the condenser 14 and the line 15 to the plate 6. The tap at the anode resistance 11 is selected in such fashion that the deflecting potentials of reverse phase taken from the two pentodes possess the same amplitude. The anode potential is conducted to the two pentodes from the same potential source 16 through the medium of the potentiometer 17. Since the anode alternating potentials occurring in the anode circuits of the two pentodes in this manner completely compensate each other, it is rendered possible up to now by the arrangement according to the invention to reduce to a minimum, or possibly also omit entirely, special steadying means always necessary otherwise in the anode circuit.

The condenser 18 may be selected at .5 m. f., the condensers 19 and 20 each at 1 m. f., the resistances 21, 22, 23 at .1 megohm, the two tapping sides of the resistance 17 each at 5,000 ohms, the resistance 24 at 25,000 ohms, and the resistance 7 at .1 megohm. The resistance 7 should preferably always be small in relation to the working resistance.

The arrangement according to the invention is for use both in the line-deflection as well as the image-deflection portion.

For the line-deflection portion the condensers 25, 26 and 14 should each be selected at 1000 cm., and the two anode resistances each at 20,000 ohms.

For the image portion the condensers 25, 26 and 14 may be selected preferably each at .1 m. f., and the anode resistances 11 and 27 each at .1 megohm. The position of the tapping point, as already stated, is determined by the amplification of the pentodes in respect of the different frequencies, and is always selected to be such that the deflecting potentials possess the same amplitude. Variations of the above dimensions cited as examples are of course possible without departing from the principle of the invention.

Since the image portion permits of better amplification than the line portion (approximately 100:20), it is necessary, more particularly in those cases in which the complete scanning potentials

are transmitted by wireless, to modulate the transmitter accordingly.

It is also possible to impart a different direct potential to the plates 5 and 6, and in this manner to accomplish that the ray in the state of rest emerges from the space between the plates 6 and 4 displaced at any desired angle in relation to its direction of entry. In this manner it is possible to avoid the stagger otherwise occurring when using the system according to the invention, and to accomplish that the ray in the state of rest meets exactly against the centre point of the image screen.

I claim:

1. A Braun tube comprising an evacuated envelope encasing a cathode and an anode arranged in operative relationship thereto, means for controlling the intensity of the cathode ray generated with the aid of a D. C. potential difference between said electrodes, a picture receiving screen, one system of deflecting plates for deflecting the cathode ray in one direction, a further system of deflecting plates for deflecting the cathode ray in a direction perpendicular to the first said one, said systems of deflecting plates being mounted between said anode and said screen, each of said systems comprising two outer plates and two middle plates, said middle plates being mounted one behind the other one with respect to the direction of the cathode ray and the planes of said middle plates of each of said systems being parallel to those of said outer plates of the same system,

2. A Braun tube comprising an evacuated envelope enclosing a cathode and an anode arranged in operative relationship thereto, means for controlling the intensity of the cathode ray generated by means of a D. C. potential difference between said electrodes, a picture receiving screen, one system of deflecting plates for deflecting the cathode ray in one direction, a further system of deflecting plates for deflecting the cathode ray in a direction perpendicular to the first said one, said systems of deflecting plates being mounted between said anode and said screen, each of said systems comprising two outer plates and two middle plates, said middle plates being mounted one behind the other one with respect to the direction of the cathode ray and the planes of said middle plates of each of said systems being parallel to those of said outer plates of the same systems, said middle plates being adapted to be supplied each with a constant positive bias with respect to each of the outer plates, one of said outer plates being adapted to be supplied with a constant potential, and the other one of said outer plates being adapted to be supplied with a deflecting voltage, that one of said middle plates of each system lying nearer to said picture receiving screen being adapted to be supplied with a voltage corresponding to said deflecting voltage with respect to amplitude, but reversed in phase, and means for connecting all of said electrodes to their respective circuits.

3. A Braun tube comprising an evacuated envelope enclosing a cathode and an anode arranged in operative relationship thereto, means for controlling the intensity of the cathode ray generated by means of a D. C. potential difference between said electrodes, a picture receiving screen, one system of deflecting plates for deflecting the cathode ray in one direction, a further system of deflecting plates for deflecting the cathode ray in a direction perpendicular to the first said one, said systems of deflecting plates being mounted between said anode and said screen, each of said systems comprising two outer plates and two middle plates, said middle plates being mounted one behind the other one with respect to the direction of the cathode ray and the planes of said middle plates of each of said systems being parallel to those of said outer plates of the same system, said middle plates being adapted to be supplied each with a constant positive bias with respect to each of the outer plates, said middle plates being connected with each other by means of a highly ohmic resistance mounted inside said tube, one of said outer plates being adapted to be supplied with a constant potential, and the other one of said outer plates being adapted to be supplied with a deflecting voltage, that one of said middle plates of each system lying nearer to said picture receiving screen being adapted to be supplied with a voltage corresponding to said deflecting voltage with respect to amplitude, but reversed in phase and means for connecting all of said electrodes to their respective circuits.

4. A Braun tube comprising an evacuated envelope enclosing a cathode and an anode arranged in operative relationship thereto, means for controlling the intensity of the cathode ray generated by means of a D. C. potential difference between said electrodes, a picture receiving screen, one system of deflecting plates for deflecting the cathode ray in one direction, a further system of deflecting plates for deflecting the cathode ray in a direction perpendicular to the first said one, said systems of deflecting plates being mounted between said anode and said screen, each of said systems comprising two outer plates and two middle plates, said middle plates being mounted one behind the other one with respect to the direction of the cathode ray and the planes of said middle plates of each of said systems being parallel to those of said outer plates of the same system, said middle plates being adapted to be supplied each with the same constant positive bias with respect to each of the outer plates, one of said outer plates being adapted to be supplied with a constant potential, and the other one of said outer plates being adapted to be supplied with a deflecting voltage, that one of said middle plates of each system lying nearer to said picture receiving screen being adapted to be supplied with a voltage corresponding to said deflecting voltage with respect to amplitude, but reversed in phase, and means for connecting all of said electrodes to their respective circuits.

5. A Braun tube comprising an evacuated envelope enclosing a cathode and an anode arranged in operative relationship thereto, means for controlling the intensity of the cathode ray generated by means of a D. C. potential difference between said electrodes, a picture receiving screen, one system of deflecting plates for deflecting the cathode ray in one direction, a further system of deflecting plates for deflecting the cathode ray in a direction perpendicular to the first said one, said systems of deflecting plates being mounted between said anode and said screen, each of said systems comprising two outer plates and two middle plates, said middle plates being mounted one behind the other one with respect to the direction of the cathode ray and the middle plates of each of said systems lying in different planes which are parallel to those of said outer plates of the same system, said middle plates being adapted to be supplied

each with a constant positive bias with respect to each of the outer plates, one of said outer plates being adapted to be supplied with a constant potential, and the other one of said outer plates being adapted to be supplied with a deflecting voltage, that one of said middle plates of each system lying nearer to said picture receiving screen being adapted to be supplied with a voltage corresponding to said deflecting voltage with respect to amplitude, but reversed in phase, and means for connecting all of said electrodes to their respective circuits.

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