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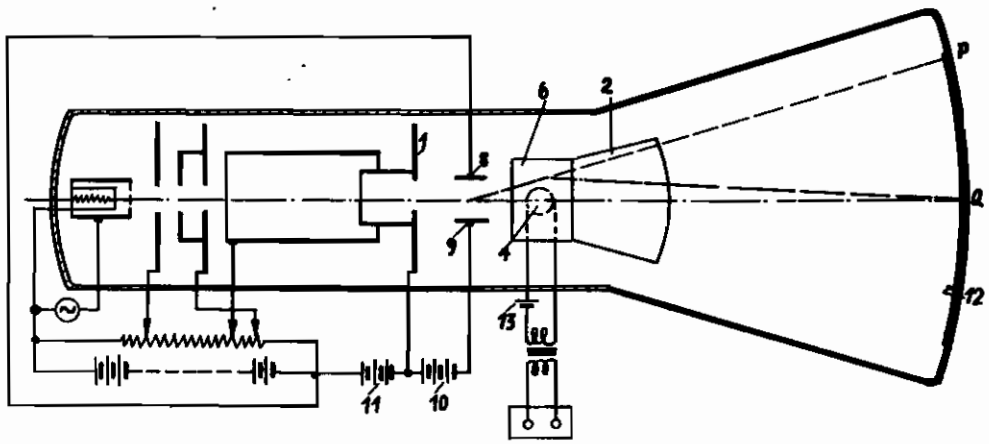

Fig.1

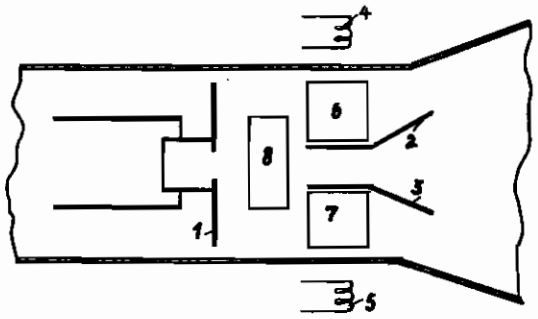

Fig.2

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ALIEN PROPERTY CUSTODIAN

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In Braun tubes with mixed electrostatic and electromagnetic deflection there is found on the fluorescent screen after a period of operation of several hours a dark line which extends transversely through the image field parallel to the magnetic and electric lines of force.

The line results from the impact of ions on the fluorescent screen. As well known the deflection in electrostatic fields is independent of the mass of the particles, whereas an electro-magnetic field causes a splitting of the bundle of rays owing to the different effect of particles of different mass. If, for example, in the case of a television tube, the screen is prodiced by mixed electrostatic and electro-magnetic deflection, the conditions are such that the ions in the electrostatic field are deflected in exactly the same fashion as the electrons, whereas in the magnetic field they are hardly appreciably affected. The ions accordingly pass over a fairly sharp line through the centre of the image field parallel to the magnetic and electric lines of the field.

The ions meet against the fluorescent screen with great kinetic energy. Since at the present time sulphide is the chief material employed for the screen, the black line results under the well known greatly reducing action of the ions by reduction of the zinc sulphide, which latter consists of a thin layer of metallicly separated zinc.

According to the invention, for the purpose of avoiding these interferences, there are provided in the space between the anode and the screen-producing deflecting means an additional pair of deflecting plates, the lines of force of which are parallel to the lines of force of the screen-producing deflecting condenser. The plates of this condenser have a potential of such nature applied to the same that the ray, in its position of rest, is deflected beyond the extreme edge of the image. Since this preliminary deflection takes place electrostatically the electrons and the ions are acted upon in equal fashion.

By means of a direct current traversing the deflecting coils the ray is again deflected back to the centre of the image field. Since this deflection occurs magnetically, it is only the electrons which respond to the same, whilst the interfering ions leave the image screen in the direction determined by the preliminary electrostatic deflection.

The deflection of the image point for producing the screen takes place as before by the usual methods.

A possible embodiment of the invention is illustrated in the drawings, in which

Fig. 1 shows the tube according to the invention in an axial section parallel to the planes of the main deflecting plates, whilst

Fig. 2 is a sectional view, vertical thereto, of the deflecting space.

In the drawings, 1 is the anode, 2 and 3 are the main deflecting plates for the electrostatic deflection in the direction of the lines of the image, 4 and 5 are the coils for the magnetic deflection vertical to the direction of the lines, and 6 and 7 are two sheet iron boxes, which in the known fashion act as pole shoes for the electromagnet.

According to the invention, there are located in the space between the anode 1 and the deflecting means 2/3 or 4/5 an additional pair of deflecting plates, which consist of two plates 8 and 9 of non-magnetic sheet metal. The deflecting plates 8 and 9 are applied with the aid of two potential sources 10 and 11 to potentials which are preferably symmetrical with relation to the anode potential, and which are so selected that electrons and ions are deflected in common by at least one-half of the width of the image field, the ray in its stationary condition accordingly impinging on the image screen 12 at the point P. In order now again to return the electrons alone to the centre point Q of the image screen an auxiliary direct current, which is supplied by a current source 13 indicated diagrammatically in Fig. 1, is passed through the deflecting coils 4 and 5. In this manner the electronic ray alone is deflected back to the centre of the image. The electronic ray accordingly passes to Q whilst the ionic ray passes to the point P situated outside of the image field.

The requisite auxiliary potentials can be derived from the existing mains apparatus. It is also possible to dispense with one of these potentials by connecting the plate 9 in direct fashion to the anode. The battery 10 and one of the additional leading in elements can then be omitted. If it is desired to avoid special leading in points entirely, the plate 8 can also be connected to a diaphragm situated within the tube. The sheet iron boxes 6 and 7 are preferably joined up with anode potential. An insulation of the boxes against the deflecting plates 2 or 3 is not absolutely essential.

The invention can naturally be employed with the same advantage in the case of tubes operating with purely magnetic deflection. In the same the interfering effect of the ions makes itself noticeable by the occurrence of a black spot of the centre of the image field.

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