The present invention relates to the construction of the cross deflecting systems used in cathode ray tubes in which deflection in one coordinate direction is effected electrically by means of plates disposed in a vacuum and in the other direction magnetically by means of coils also disposed in vacuum.

One object of the invention is to provide a deflecting system which is characterized by its particular simplicity and compact structure and which at the same time may be produced by the glass blowing art. It has hitherto been customary to fasten the individual electrodes to fused-in tips or to arrange them in order on glass or ceramic supports. Difficulties arise however when a large number of electrodes is used since the position of the individual electrodes cannot be maintained with sufficient accuracy during their constructional positioning and after preliminary heating. When the electrodes are positioned with insulating elements interposed between them the inexactness of adjustment increases as the separation from the first electrode forming the reference surface increases, so that the last electrodes embody unpermissible positional errors.

In accordance with the present invention, two deflecting plates are fastened to a common support by means of the insulating coil members used for both deflecting windings, the said support serving to hold both halves of the deflecting system in a rigid manner facing each other.

The drawing illustrates by way of embodiment a tube in which the common support member is positionedly adjusted through agency of a fitting surface of the glass wall of the tube.

Fig. 1 shows a section through a portion of the base of the tube. Fig. 2 is a side view of the deflecting system. The two windings 1, used for deflecting in one coordinate direction, are wound on two insulating coil bodies 2 which are coaxially or nearly coaxially disposed close to both sides of the ray and upon the mutually facing sides of which the two electrically deflecting plates 3 are fastened. The coils are connected on the other side by means of connecting member or yoke 4. This yoke serves to effect the entire adjustment of the system. In the arrangement shown in Fig. 1 the ray passes through the center of the yoke and enters into the system. For this purpose the yoke 4 is provided at that point with an opening 5 which is centered with respect to the system. The plates are suitably adapted to accommodate the ray, that is, they have an inlet interval equal to the ray diameter and an outlet interval of such size that the maximum outwardly deflected ray can just leave the plate without touching. In front of and behind the deflecting plates the two insulating members 7 of the coil windings each carry a screen electrode 6 and 7. The common potential of these screen electrodes should be made equal to the mean potential of the deflecting plates (the anode potential in the case of symmetrically biased plates).

The retaining yoke 4 of the deflecting system may be provided at the ray inlet side and concentric to the passage portion of the ray, with a conical or cap shaped fitting surface 8 by means of which the system can be centered on corresponding surfaces 9 of the glass base said fitting surface 8 having a flat base 10 fixed to yoke 4. The glass base consists of two concentric tubes 12 and 13 which are fused together on the side turned towards the screen. The conical portion is either fitted into the inner tube 12 or onto the outer tube 13 and its base plate 18 suspended by means not illustrated, at three points on its periphery, e.g. by means of wire loops and screws, to three hooks or lugs on the outermost base tube. Spreading springs 14, e.g. four springs 25 made of nickel-beryllium alloy may be fastened to the base plate 18 so as to effect contact of the conducting inner wall 15 which engages yoke 4 and is concentric with tubes 12 and 13 with an internal metal or high-ohmic coating 19 serving subsequently to accelerate the already cross-controlled cathode ray. The lead-in conductors 16 leading to the deflecting plates and coils as well as those carrying the anode voltage are preferably located at the fusion junction of both base tubes. A small ray-concentrating collector coil, not shown, may be disposed in the concentric annular space 17 between the two base tubes and is intended for guiding the magnetic field back towards the screen-side end of the coil, the coil being surrounded by an iron jacket open at that end.

What is claimed is:

1. In a cathode ray tube, deflecting electrode mounting means comprising a reentrantly folded annular envelope portion, a conical supporting and conducting element adapted to inwardly engage said annular envelope portion, a bi-furcated yoke fixed to said conical element, a pair of insulating material fixed to each bi-furcated portion of said yoke, a deflecting coil wound about each of said spoons, and a deflecting plate fixed upon each of said spoons.

2. In a cathode ray tube having an envelope enclosing electrodes, electrode mounting means, interest.
comprising a doubly reentrant annular stem portion formed in said envelope, a bi-furcated yoke having divergent legs, a conical apertured member disposed centrally upon said yoke, an insulating spool disposed adjacently upon each yoke leg, a deflecting coil wound about each of said spools, and a deflecting plate disposed upon each of said spools; said conical member being adapted to fit within said annular stem portion, and having means formed on said envelope wall adapted to cooperate therewith to fixedly constrain said conical member.

3. In a cathode ray tube as described in claim 2, field controlling means comprising plates fixed to each of said spools in approximate continuance of and divergent from said deflecting plates.

4. In a cathode ray tube having deflecting means supported therein after claim 2, having a conducting coating disposed inwardly upon the tube walls, means for connecting said supporting yoke to said conducting wall coating.

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