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E. BRÜCHE

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ELECTRON TUBE

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Fig. 1

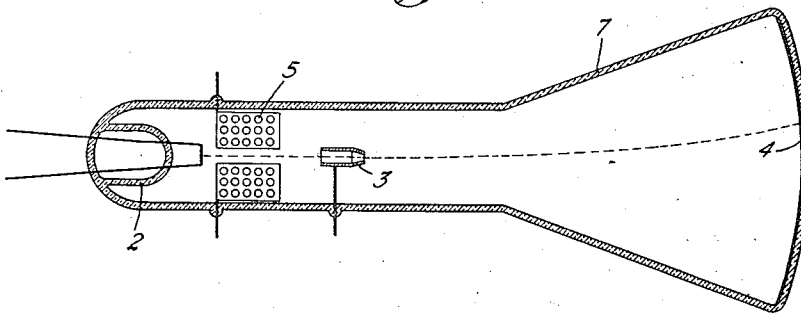
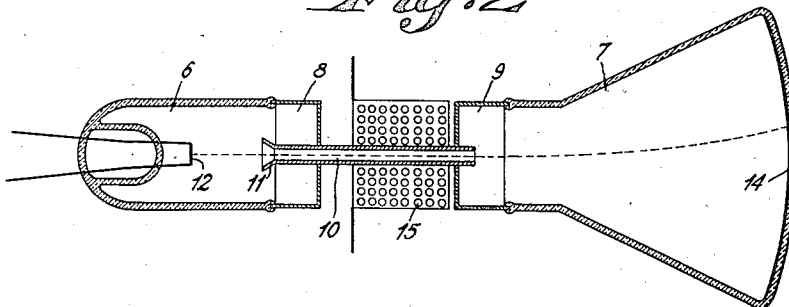


Fig. 2



INVENTOR
ERNST BRÜCHE
BY *H. S. Swope*
ATTORNEY

UNITED STATES PATENT OFFICE

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ELECTRON TUBE

Ernst Brüche, Berlin-Reinickendorf, Germany,
assignor to Allgemeine Elektrizitätsgesellschaft,
Berlin, Germany, a corporation of Germany

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1 Claim. (Cl. 250—27.5)

The present invention relates to a new method and means to control an electron ray tube of the cathode ray type for use in sound film and television work.

5 In electron ray tubes used for sound film and television work the intensity of the spot produced upon the tube fluorescent screen or end wall due to the bombardment thereof by the cathode ray has heretofore been regulated electrostatically,
10 especially the so-called Wehnelt cylinder having been employed for this purpose.

15 Instead of electrostatic control of the brightness or luminosity of the resulting image spot recourse is had according to the present invention to magnetic control. In controlling the ray intensity in this manner the magnetic field of a coil traversed by the controlling currents and whose axis coincides with the axis of the ray pencil is brought to act upon the latter in such
20 manner as to produce a controlling action thereon. In the practical application of this idea it is essential that the coil should surround the ray pencil in a similarly close manner as the Wehnelt cylinder.

25 The accompanying drawing serves to illustrate the general principles of the invention and show two suitable forms of tube arrangements. By the drawing, Fig. 1 shows the magnetic field applied close to the cathode and arranged somewhat like a Wehnelt cylinder; and Fig. 2 illustrates a modified control arrangement using the same general control principle.

30 Referring now to the drawing, and first to Fig. 1, the cathode ray tube 1 is shown to include a cathode member 2, an anode member 3 and the fluorescent screen 4 which is rendered luminous by bombardment thereof by the cathode ray pencil 20. To regulate the intensity of the electron ray pencil 20 there is provided a coil 5 which snugly
40 embraces or surrounds the electron ray pencil and which sets up interiorly a field which extends in the direction of the electron ray pencil.

45 In another embodiment of the invention, such as that shown by Fig. 2, ways and means are adopted to mount the coil exteriorly of the tube while yet the electron ray pencil is made to be closely surrounded by the coil. The cathode ray tube, according to this modification, comprises
50 two parts 6 and 7 which are closed by metal caps 8 and 9, and which are inter-connected by a conducting tube 10 fitted into the metallic caps. The

conducting tube 10 which has an inside diameter of 2 or 3 mm. has at one end a flared opening 11 which is placed opposite the heated cathode 12 mounted inside the vessel 6. The conductive tube 10 may at the same time be used to act as the
5 anode by applying a suitable potential thereto by means of the lead 13. The electrons emanating from the cathode 12 are driven through the conducting tube member 10 and are made to impinge upon the fluorescent screen 14 mounted upon
10 inside surface of the end wall of the vessel 7. By the aid of the coil 15 snugly surrounding the conductive tube 10 it is thus feasible to influence the intensity of the electron ray pencil. In order to insure as high as feasible an intensity of
15 the pencil by action of the coil, the latter is disposed most suitably at as close a proximity as possible to the outlet opening of the electron pencil 20, as illustrated in the drawing. Instead of the conducting tube 10 there could also be used
20 a glass tube rendered interiorly conductive, for instance, by having a silver coating applied to the inner wall. In this case the caps 8 and 9 may be dispensed with since the glass tube may be united or fused directly with the cap members
25 6 and 7.

Having now described the invention what I claim is:

30 A cathode ray tube comprising an evacuated container, means within the container for generating a cathode ray, a second container having provided therein at one end a fluorescent viewing screen, an elongated tubular anode connecting the separate containers to permit the cathode
35 ray pencil generated within one container to be passed therethrough to the second container, and electro-magnetic means surrounding the said tubular anode in the space between the two containers, said electro-magnetic means being adapted to have applied thereto varying magnitude
40 electric signals for producing varying strength magnetic fields along the axis of the tubular anode to vary in accordance with the variations in the electrical signals the electron concentration
45 within the generated cathode ray without diminishing the total electron content of the ray so as to control the observable intensity of the luminous effect produced upon the fluorescent viewing screen while maintaining constant the electron flow toward the screen.

ERNST BRÜCHE.