

May 16, 1939.

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2,158,314

CATHODE RAY TUBE

Filed July 15, 1936

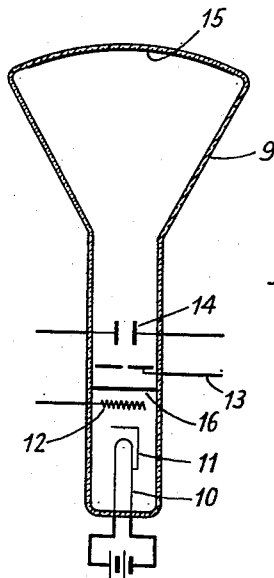


Fig. 1

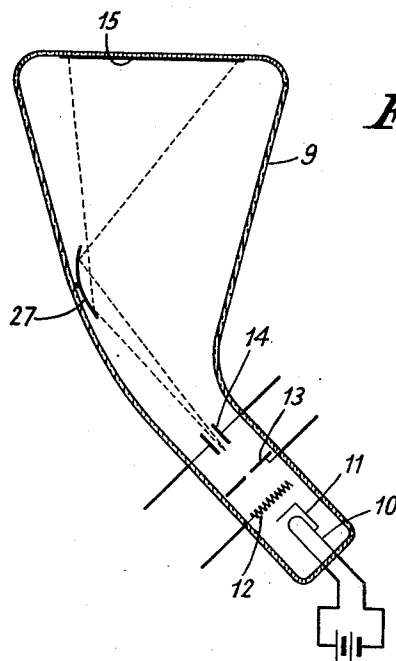


Fig. 2

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2,158,314

CATHODE RAY TUBE

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Application July 15, 1936, Serial No. 90,704
In Germany July 16, 1935

2 Claims. (Cl. 250-141)

This invention relates broadly to improvements in cathode ray tube construction and more specifically to a cathode ray tube in which the normally objectionable light, due to the cathode, particularly glow cathodes, is obviated from the standpoint of the observer.

In the hitherto known Braun tubes, the luminous glow of the cathode could be viewed through the screen on which the image is produced and hence gave a disturbing effect. This disturbance was also encountered when using indirectly heated cathodes and oxide cathodes in which the cathode structure is brought only to a red glow, and it has been particularly noticeable where the normal background light of the image on the luminescing screen has been of a low value resulting in a decided contrast between the dark image and the cathode surface.

The present invention overcomes this drawback by either optically screening the glow cathode or so positioning the cathode with respect to a luminescing screen that the cathode itself will not lie in any plane of projection of the screen.

My invention will best be understood by reference to the accompanying drawing in which:

Figure 1 shows an optically shielded cathode arrangement and,

Figure 2 shows a displaced cathode arrangement.

Referring to Figure 1, 9 represents a cathode ray tube envelope containing a heating element 10, a cathode 11, a control element 12, an anode 13 (the biasing source of which is not shown), and one set of deflecting plates 14 and a luminescing screen 15. Interposed between the cathode and the luminescing screen 15 in the optical path of the observer, is a shield which is pervious to the electrons in the widest degree and which is impervious to the light emitted from the cathode. A thin metal foil, such as aluminum foil for instance, has been used and constructed after the manner of the so-called Lenard type of window. Electron absorption can be reduced radically by using an extremely thin metal foil. Since the foil is not subject to mechanical stress, it may be extremely thin, thus providing a member which is pervious to the flow of the electron

beam but impervious optically. As a result, the glow from the cathode is not seen by the observer on the screen.

Referring to Figure 2, an envelope member 9 contains the usual cathode ray tube elements, i. e., a heater 10, cathode 11, etc., same as in Figure 1, but the cathode is so displaced with respect to the luminescing screen 15, that the cathode does not lie in any plane of projection of the screen and hence is unobservable from the standpoint of the observer. The cathode ray beam itself is directed from the cathode and the concentrating members to a concave element 27 which acts as a mirror for the beam reflecting it onto the screen 15, thus causing luminescence. An illustrative path for the position of the beam at two extremities has been indicated to illustrate the operation of the arrangement. For purposes of convenience, only one set of deflecting plates has been shown in each of the figures.

What I claim is:

1. A cathode ray tube comprising an evacuated envelope containing means for forming and accelerating an electron beam, means for modulating said beam, optically opaque means comprising a thin aluminum foil situated between said electron beam modulating means and said electron beam accelerating means, said optically opaque means being electron pervious, and a fluorescing screen positioned in said envelope remote from the beam forming means and adapted to fluoresce under the action of electron bombardment.

2. A cathode ray tube comprising an evacuated envelope containing means for forming and accelerating an electron beam, means for modulating said beam, optically opaque means comprising a thin aluminum foil situated between said electron beam modulating means and said electron beam accelerating means, said optically opaque means being electron pervious, means for deflecting said beam subsequent to its acceleration, and a fluorescing screen positioned in said envelope remote from the beam forming means and adapted to fluoresce under the action of electron bombardment.

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