Aug. 18, 1936. J. C. BATCHELOR 2,051,632

TELEVISION RECEIVING SYSTEM

Filed Jan. 15, 1932

Fig. 1.

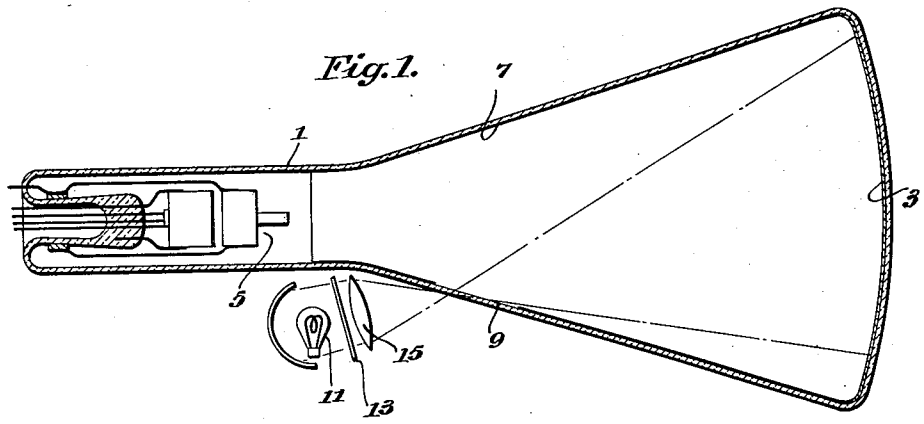
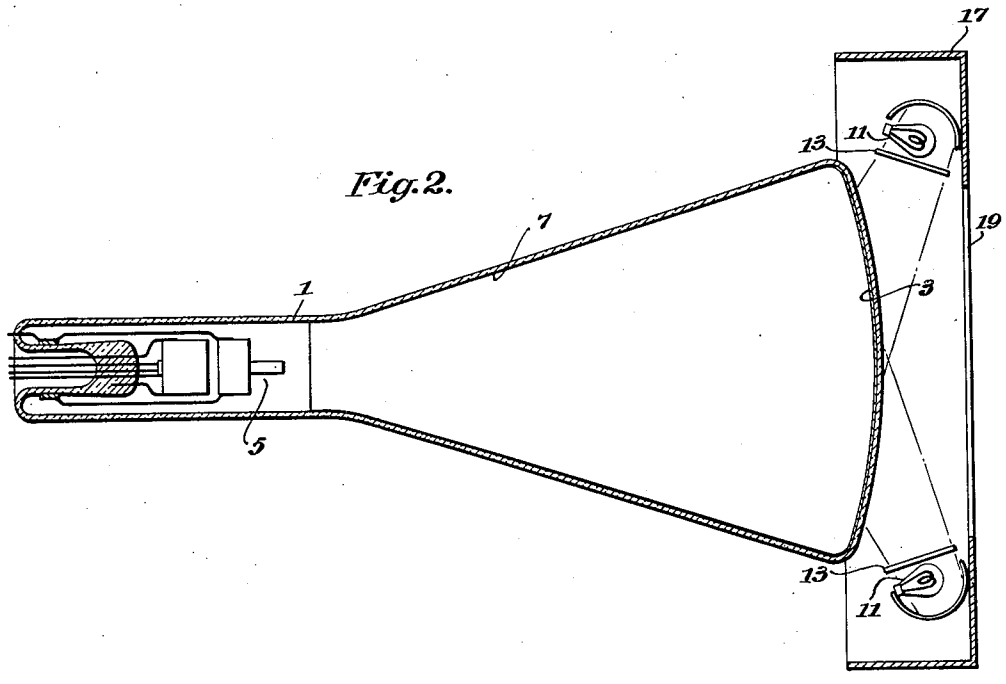


Fig. 2.



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TELEVISION RECEIVING SYSTEM

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5 Claims. (Cl. 178—6)

My invention relates to television receiving systems and, more particularly, to cathode ray devices utilized therein.

Cathode ray tubes of the general type to which my invention pertains include a fluorescent screen and a source of electrons so disposed with respect to the screen that the said electrons may be caused to traverse the screen from side to side and top to bottom, while the intensity of the ray is controlled by an incoming signal representing a picture being televised.

Up to the present time, the most efficient fluorescent materials with which I am familiar fluoresce with a greenish light which, if observed for a considerable period of time, is somewhat unpleasant. It is, of course, possible to provide fluorescent materials that produce white light when subjected to the impact of the cathode ray but such materials are not so efficient as others of the type just referred to.

It is, accordingly, an object of my invention to provide means whereby the fluorescent screen in a cathode ray receiving tube is caused to take on the appearance of being illuminated by white light instead of by green light or light of other colors, as heretofore.

The foregoing object, and other objects ancillary thereto, I prefer to accomplish, in a preferred embodiment of my invention, by providing an auxiliary source of illumination for the screen which is complementary in color to the fluorescent color, to thereby destroy the illusion of color conveyed by the said screen when it is fluorescent. More specifically, I propose to utilize a source of monochromatic light and to provide suitable reflectors or suitable optical systems whereby light from the said sources may be concentrated upon the screen with the requisite intensity to accomplish the foregoing referred to purpose.

The novel features that I consider characteristic of my invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment, when read in connection with the accompanying drawing, wherein Figure 1 is a diagrammatic view illustrating a preferred embodiment of my invention, and Figure 2 is a diagrammatic view showing an alternative embodiment.

The cathode ray tube, referring to Figure 1 of the drawing, to which my invention is preferably applied, includes an evacuated envelope 1, one end of which is provided with an interiorly disposed fluorescent screen 3 and in the other end of which is mounted a source 5 of electrons commonly known in the art as an electron gun. The device, of course, when in operation, is provided with suitable deflecting coils to control the traverse of the cathode ray, with means whereby the signal may be impressed upon a control element in the electron gun and with other controlling devices (not shown).

In certain cathode ray tubes to which my invention may be applied, there is provided an interior focusing electrode or metallic coating 7 which covers substantially the greater part of the interior surface of the large end adjacent to the fluorescent screen. The tube shown in Figure 1 is of that type. In order that my invention may be applied to such a tube, I find it expedient to interrupt the continuity of the inner electrode to leave a transparent portion 9, the interruption being best accomplished merely by heating the envelope after the device is completed. Immediately adjacent to the window so provided, I dispose either a mono-chromatic source 11 of light having the requisite color, or a Mazda lamp which provides substantially white light. If a Mazda lamp is used as described, a color screen 13 is interposed between the lamp and the window, and an appropriate optical system, exemplified by a lens 15 shown in the drawing, may also be provided, whereby light, after passing through the color screen, is concentrated upon the fluorescent screen 3.

The color screen, if the fluorescent screen is of the type which produces greenish light, may be colored violet with a tinge of red, and this may be accomplished through the use of well-known coal tar dyes.

It is also feasible to illuminate the screen from the same side that is viewed during the operation of the device, as illustrated in Figure 2. For this purpose, I prefer to dispose the screen behind a shield 17, having an opening 19, and to mount a plurality of light sources 11 and color filters 13 between the screen and the said light sources. Optical systems, as illustrated in Figure 1, may be employed, if desirable, but, by reason of the close proximity of the light sources to the fluorescent screen, I find that such optical systems are not particularly necessary.

It will, of course, be obvious to those skilled in the art to which my invention pertains, that it is not limited in its application to cathode ray tubes of the type having a fluorescent screen that gives off green light. Irrespective of the light of

fluorescence, a color screen, a mono-chromatic light, color or a combination of colors may be found which is complementary thereto and which, when utilized in the manner disclosed, will destroy the illusion of color produced by the unmodified fluorescent screen. My invention is also applicable to television receiving systems of other types which utilize neon or glow tubes as light sources, particularly when the received image is so projected onto an exterior screen that it may be viewed by a number of persons. The light from the neon tube or other tube used is somewhat unpleasant in its optical effect and the illusion of color may be corrected by also projecting onto the screen light from one or more sources complementary to the color of the light used in projecting the picture.

The advantages of my invention in the reduction of eye-strain and in rendering the received television pictures more natural and lifelike are obvious.

I claim as my invention:

1. A cathode ray device having a fluorescent screen and wherein the ray is caused to scan a given portion of said screen, means providing a light of substantially constant intensity and complementary to the effective fluorescent color of said screen, and means for directing the complementary light onto said screen and substantially uniformly over said portion thereof.

2. In combination, a cathode ray tube of the type having an electron-source and a screen which fluoresces to emit colored light when bombarded with electrons from said source and also being provided with an electron-focusing anode having a light-permeable portion, a source of light complementary in color to the light of fluorescence and means for causing light from said source to be directed through said light-permeable portion and to fall upon said screen, whereby the light of fluorescence appears as substantially white to the eye of an observer.

3. The invention set forth in claim 1 characterized in that the first mentioned means provides light that is substantially monochromatic.

4. The invention set forth in claim 1 characterized in that means are provided for preventing said complementary light from directly reaching the eye of an observer.

5. In combination, a cathode ray tube having a fluorescent screen, a plurality of light sources of substantially constant intensity disposed exteriorly of said tube, means whereby light from said sources is caused to fall upon said screen substantially uniformly, and a color filter disposed between at least one of said sources and said screen, the color filter being such that light transmitted thereby to impinge upon the screen is complementary in color to the color of the light emitted by the screen when fluorescing.

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