

May 28, 1935.

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2,002,937

TELEVISION SYSTEM

Filed July 25, 1932

2 Sheets-Sheet 1

Fig. 1

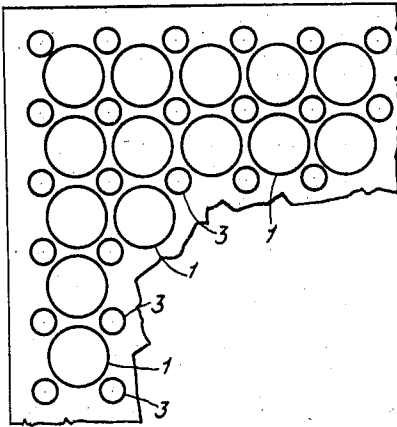


Fig. 2

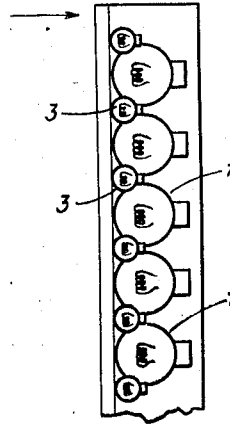
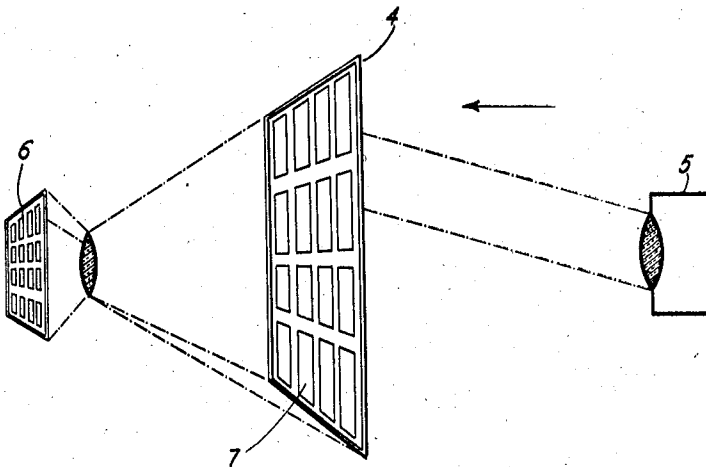


Fig. 3



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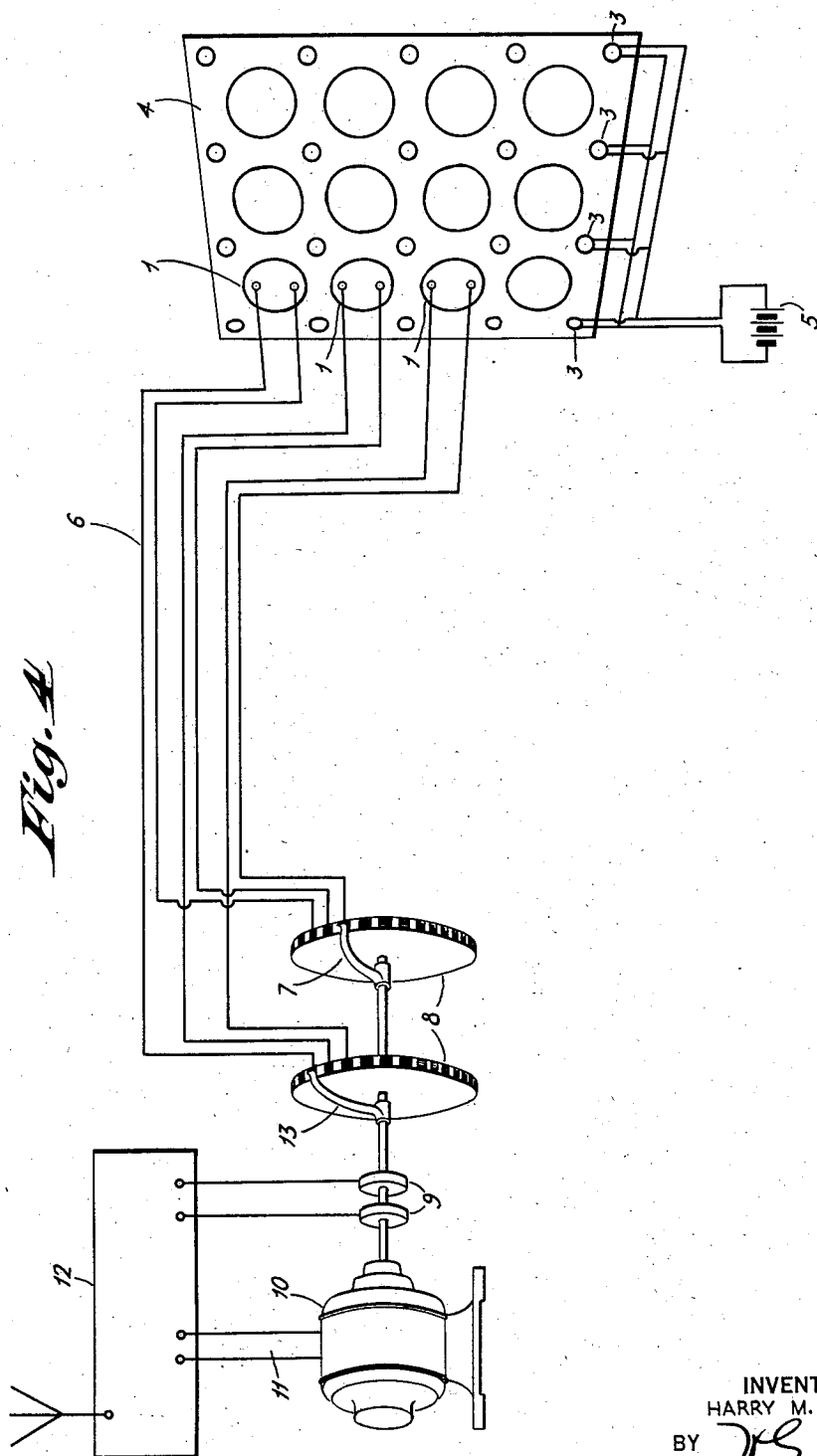
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TELEVISION SYSTEM

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2 Sheets-Sheet 2



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2,002,937

TELEVISION SYSTEM

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4 Claims. (Cl. 178—6)

This invention relates to television systems and more particularly to television receivers.

The invention has for its object to provide a television system wherein flicker in the received or reproduced picture shall be reduced or eliminated, wherein definition shall be improved, and wherein the general "finish" of the picture shall be improved.

In known television receivers employing scanning apparatus of the kind in which a spot of light is caused to traverse the received picture area, or in which picture elements are illuminated to reproduce a received picture, the intensity of any particular point on the picture at any particular instant is judged by the eye with reference to and by comparison with the intensity of a previous point or points reproduced during the period of time corresponding to the period of persistence of vision.

To put the matter in another way, the eye makes comparison with each point of the picture with a point which has been produced before the particular point being considered.

According to this invention, means are provided for creating what may be termed a "light" frame or grid or reference so that the intensity of illumination of any point in the received picture may be appreciated by the observer not with reference to a previous point in the picture, but with reference to some point in the grid or frame which is provided for this purpose.

In one way of carrying out this invention, a grid of light having the same mesh as the number of picture points or elements in the received television picture is superposed on the said received picture on the receiving screen, so that in effect the modulated light of each point in the received picture is set in or against a thin square of light which serves as a background for comparison. In the case in which the picture is built of separate picture elements, the grid is arranged to lie as accurately as possible on the dividing lines between the elements. In the case in which the received picture is built up by a traversed point of light, i. e., in which the received picture is built up in strips, the grid will in effect divide each strip transversely into the equivalent number of elements, the projection being such that the grid lines also lie on the lines of junction of the strips.

The light grid may be produced in any convenient manner, for example, by means of a lantern slide consisting of a transparent grid of the required dimensions on a opaque or black background. For direct comparison light from

a steady source may be employed and may be regulated to be about the same intensity on the screen as that of the picture area when scanned by unmodulated light.

If desired, the light grid may itself be modulated in a direction opposite to the picture modulation instead of being of constant intensity. Any known means may be employed for this purpose.

In such an arrangement the relative intensity on any picture element as judged by the eye will, assuming the modulation of the grid to be quantitatively equal to the modulation of the picture, be twice as great as would be the case if the light in the grid were unmodulated.

In cases where it is difficult or inadvisable to employ a full grid, as above described, substantial benefit may be obtained by employing merely a frame of light for serving as a base of comparison for the eye, i. e., the picture may be simply framed in a square of light which may be either of a constant intensity or may be modulated in a direction opposite to the modulation of the picture elements. Again, in place of using a simple frame of light or a full grid substantial advantage may be obtained by providing a background arrangement wherein four points of light around each picture element are provided.

The invention is illustrated and further described with reference to the accompanying schematic drawings wherein Figure 1 shows, in schematic front view, part of a television receiver which may be employed in one way of carrying out the invention, while Figure 2 shows schematically a side view of the screen of Figure 1. Figure 3 illustrates another manner of carrying the invention into practice. Figure 4 is a view of a complete receiver.

Referring to Figures 1 and 2, in the method carrying out the invention therein illustrated a television image is built up and presented to a large number of people by means of a number of signal lamps 1 which are viewed through a ground glass or similar screen 2, the audience viewing the screen in the direction of the arrow shown in Figure 2.

In accordance with the present invention small lamps 3 are placed between the signal lamps 1 as shown, and these small lamps 3 are maintained at a constant light intensity corresponding to the mean of the light intensity of the picture elements as reproduced by the signal lamps 1. The method of building up a received television picture by means of signal lamps, such as the lamps 1, is, per se, well known, and suggested, for ex-

ample, by United States Patent #1,673,828 and British Patent No. 222,604 and it is not thought necessary therefore to describe it in the present specification. To put the matter in another way, the arrangement shown in Figures 1 and 2 is a known arrangement except for the provision of the small lamps 3 which constitute a "light" frame or grid of reference.

In the method of carrying out the invention illustrated in schematic perspective in Figure 3, a television screen 4 composed of translucent material is provided and is viewed in the direction of the arrow shown in Figure 3. The television picture elements, i. e., the elements which together constitute the received viewed television picture, are projected on to the screen 4 by means of a television projector schematically indicated at 5, the built-up picture being seen by reason of light reflected from the screen 4. 6 represents a lantern slide or similar device having marked thereon a "light" grid and this "light" grid is then thrown by a lantern on to the rear side of the screen 4 so as to produce on the said screen a corresponding light grid. As will be seen, the light grid thrown on the rear face of the translucent screen 4 by means of the lantern and lantern slide, forms a network of lines of constant intensity and this intensity is chosen at the mean of the intensity of the modulated picture elements. These picture elements are schematically represented at 7.

In a further modification (not illustrated) both the light grid and the modulated picture elements are projected from the same side of the screen on to the said screen, which may be viewed either by reason of light reflected therefrom, or by light projected therethrough. In other words, the arrangement of Figure 3 may be modified by locating the parts 6 and 5 both on the same side of the screen 4.

It will be seen that the present invention provides the advantage, inter alia, that irregularities in scanning alignment will, to a great extent, be masked.

A complete diagrammatic sketch of a television receiver and projector utilizing the form of screen shown in Figs. 1 and 2 is shown in Fig. 4.

12 is the television receiver which passes the synchronizing impulses along the wires 11 to the synchronous motor 10. This motor drives the commutator arms 7 and 13 thereby allowing television signals to flow to the correct signal lamps 1 of the screen 4, through the slip rings 9, the commutator segments 8 and the connecting wires 6.

The lamps 3 are kept lighted at a constant in-

tensity by means of the battery or source of D. C. 5.

Having now described my invention, what I claim and desire to secure by Letters Patent is the following:

1. In television receiving apparatus, a viewing panel on which electro-optical image reproductions are to be made, means for producing over the several elemental areas of the viewing panel signal controlled point representations of the varying values of lights and shadows of a subject of which the electro-optical image is being produced, and a plurality of light producing means surrounding each point of controlled light representation for producing independently of signalling indications constant intensity illumination over areas surrounding the areas of image point representations.

2. In television receiving apparatus, a viewing area, means for producing on the viewing area a sequence of light points of varying intensities of lights and shadows controlled in accordance with received signalling indications, a plurality of independent light producing elements surrounding each light point, and means for energizing each of the plurality of light producing means to produce a plurality of constant intensity light representations over areas substantially adjacent the areas of controlled intensity light representations.

3. In television apparatus, a plurality of light sources arranged with loci corresponding to the several elemental areas into which a subject of which the electro-optical image is desired is assumed to be divided for image transmission purposes, means for energizing the several light sources successively to cause illumination thereof along a series of paths substantially parallel, a plurality of independent light sources arranged adjacent each of the first named light sources, and means for illuminating the last named light sources from a local source to a constant intensity illumination.

4. In television receiving apparatus, a plurality of light producing elements for recomposing a viewed television image, a second plurality of light producing elements interposed between each of the first named light producing elements, means for receiving television signals, means for controlling the intensity of light on successive light producing elements of the first named plurality in accordance with the received signals, and means for illuminating the second plurality of light producing elements from a local source.

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