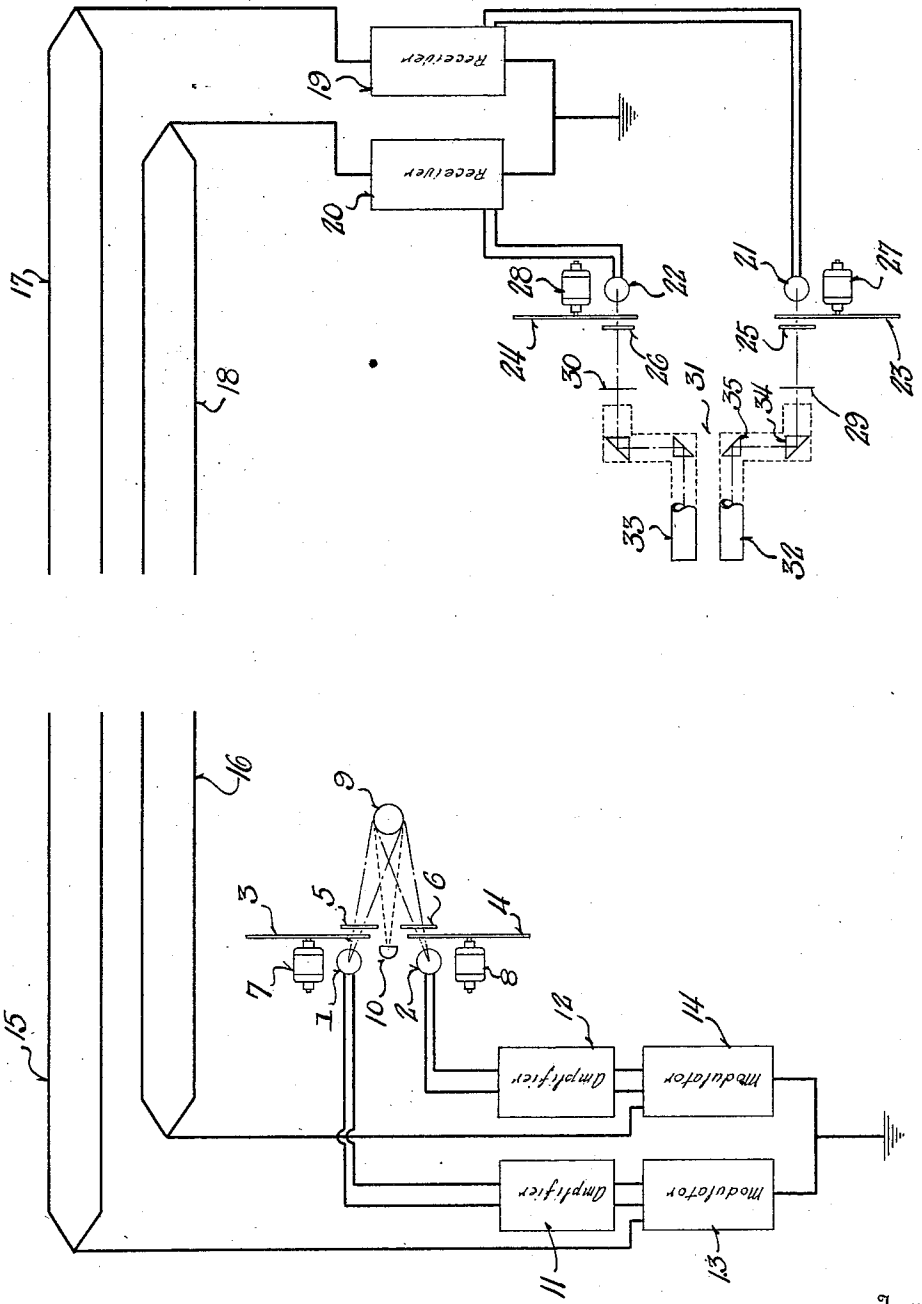
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TELEVISION APPARATUS AND METHOD OF TELEVISING

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TELEVISION APPARATUS AND METHOD OF TELEVISING

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The invention relates to television apparatus and to the method of televising.

This invention is designed to provide a television apparatus and a method of televising in which a binocular effect is produced.

In its broadest aspects, this invention contemplates the transmission of images by electrical means and the reproduction of the image at the receiving end or station in such a manner as to produce the effect of binocular vision for the observer.

Further objects of this invention are to provide a television apparatus and a method of televising in which spaced light responsive means are employed at the transmitting station and in which spaced light producing or light controlling means are employed at the receiving end or station, the later means being selectively controlled by the former means.

Further objects of this invention are to provide a method of producing a binocular effect by means of television which is applicable to wireless transmission or to wire transmission.

Further objects are to provide a television apparatus for producing a binocular effect in which two spaced light responsive means are associated with scanning means and control modulating means whereby electrical energy is modulated and in which a receiving apparatus is provided to selectively receive the modulated electrical energy, the receiving apparatus having spaced light controlling or producing means, themselves electrically controlled, associated with means whereby separate images are formed for the two eyes of the observer.

An embodiment of the invention is shown in the accompanying drawing in which the single figure is a diagrammatic view showing a sending and receiving apparatus.

The sending or transmitting station is provided with a pair of separate light responsive means 1 and 2, which may take the form of photo-electric cells, for instance, and which are spaced apart. Each cell may be associated with some form of scanning means, such, for example, as the scanning discs 3 and 4 which cooperate with the apertured plates 5 and 6, the discs being driven in any suitable manner either separately, as by means of the motors 7 and 8, or by a single drive mechanically or electrically coupled. These photo-electric cells are adapted to receive light from any object such as indicated by the reference character 9. This object may be a moving object, a still object, a picture, or any other article.

In the form shown, a source of light 10 has been indicated. Obviously any number of light sources could be employed, and, if desired, sources of radiant energy outside of the visible spectrum could be employed for energizing the object.

It is to be distinctly understood that, if desired, the object and the photo-electric cells or other light responsive means could be enclosed in a dark room and a scanning spot of light could traverse the object. The illustration in the form used in the drawing is merely a means employed to illustrate one of the many forms that the apparatus may take, and it is to be definitely understood that this illustration and the accompanying description is not intended as limiting in any sense, but merely as one specific method in which the invention may be embodied.

It is also to be understood that the light responsive means referred to and indicated by the reference characters 1 and 2 may be means responsive to light in the visible spectrum or means responsive to radiant energy outside of the visible spectrum.

The photo-electric cells 1 and 2 control amplifiers 11 and 12 which in turn control modulators 13 and 14. These modulators, in the form of the invention shown, are adapted to sent out wireless waves of different wave lengths. For example, the modulator 13 is connected to the antenna 15 and the modulator 14 is connected to the antenna 16, both modulators being, of course, connected to the ground or counterpoise. Obviously, loops could be used, if desired, in place of the antenna systems, and in fact, a single antenna could be employed, depending, of course, upon the particular wireless system utilized.

From the description thus far given, it is apparent that the value of the wireless wave

radiated from the antenna 15 is controlled by the light falling upon the photo-electric cell 1, and the energy radiated by the antenna 16 is controlled by the light falling upon the photo-electric cell 2.

In the form of the invention shown, it is intended that the cells 1 and 2 be spaced apart a distance approximately equal to the distance between the eyes of a person. It is obvious that the same result could be secured by optical means, and the spacing of the photo-electric cells could be varied, provided that the points of entrance of the two beams of light into the optical means be spaced apart a distance corresponding to the average spacing of a person's eyes.

In the following description and in the claims it is intended, therefore, that the expression light responsive means be interpreted as covering either the arrangement illustrated in the drawings in which the photo-electric cells are actually spaced apart the distance noted above, or in which the optical means associated with the light responsive means are spaced apart such distance that the two rays of light entering the apparatus actually enter such apparatus at points corresponding to the spacing of the eyes of a person.

The receiving apparatus or receiving station employs the pair of antennæ indicated at 17 and 18 which are connected to the wireless receiving devices or apparatus 19 and 20, such devices being either grounded or connected to a counterpoise.

It is obvious that loops could be employed for either the sending or the receiving apparatus, or for both such apparatus.

The receiving apparatus 19 is connected to a light producing or light controlling device 21, and similarly the receiving apparatus 20 is connected to a light producing or light controlling device 22. These devices may take the form of the usual television lamps, if desired.

In the form of the invention shown, scanning discs 23 and 24 are associated with the light producing devices 21 and 22 respectively, and the usual apertured screens 25 and 26 are employed with the scanning discs.

The scanning discs may be driven in any suitable manner, either from a single drive or from separate drives, as, for instance, the electric motors 27 and 28.

The scanning disc 23 is synchronized with the scanning disc 4 and the scanning disc 24 is synchronized with the scanning disc 3 in any suitable manner, not shown. Any of the usual means employed for this purpose could be used.

Screens 29 and 30 are adapted to receive the rays of light from the devices 21 and 22. These screens may be ground glass, for instance, or may take other forms. An optical apparatus indicated generally by the reference character 31 is associated with the screens and is adapted to conduct light from the screens to the two eye pieces 32 and 33, as shown in the drawing. If desired, total reflecting prisms 34 and 35 may be employed in the optical apparatus, so that the screens 29 and 30 may be spaced apart a greater distance than the average spacing of a person's eyes. However, in the form chosen for illustration, the eye pieces 32 and 33 are spaced apart the average distance of a person's eyes, in accordance with a well known practice in optical devices. Either one or both of the pieces may be made adjustable either as to focus or as to position, although this old expedient has not been shown in the drawing.

The purpose of spacing the screens 29 and 30 apart a greater distance than the spacing of a person's eyes is to facilitate the positioning of the lamps or light producing devices and the scanning apparatus. Obviously the lamps may be spaced apart the average distance of the spacing of a person's eyes, and under these conditions it would not be necessary to employ the total reflecting prisms.

It is within the province of this invention to vary the spacing between the light responsive devices 1 and 2 and correspondingly vary the position of the light producing or controlling parts and the optical apparatus in the receiving station, provided the effect produced at the eyes of the observer gives binocular vision.

The transmitting apparatus may send out two different waves which may be only slightly different or may be widely different, and the receiving apparatus is accordingly tuned to these two waves in order to secure the selective control.

The desired result could be secured in other ways not shown in the drawing. For example, a single wave could be employed and the separate halves or loops of this wave could be separately controlled and separately utilized at the receiving end.

It is, of course, within the province of this invention, to transmit the electrical impulses by wire as well as by wireless, without departing from the spirit of this invention. In fact, a carrier wave could be employed or other electrical impulses could be used.

In the operation of the apparatus in the particular form chosen for illustration, the object is illuminated, and as the scanning devices operate at the sending end, the intensity of the light falling upon the two light sensitive devices 1 and 2 varies in accordance with the lighting of the object. It will be seen that the light falling upon the two light sensitive devices 1 and 2 corresponds to the light that would fall upon the eyes of an observer stationed at this position.

The modulated wireless waves are received at the receiving station by the devices 19 and 20 which, in turn, control the lamps 21 and

22, such lamps increasing or decreasing in brilliancy in proportion to the intensity of light falling upon the light sensitive devices 2 and 1 respectively. Obviously the lamps, the scanning apparatus, and the associated optical device produces a picture for each side of the receiving apparatus. These pictures are transmitted to the eyes of the observer. Thus binocular vision is obtained. The effect of this is the same as if the observer at the receiving end were at the transmitting end and looking at the object with both eyes. In other words, a perfect binocular result or effect is obtained.

It will be seen that a novel form of television apparatus has been provided by this invention which not only transmits the picture of the object, but this transmitted picture, or pictures, results through the medium of the apparatus described in detail above in the production of a binocular effect at the receiving end. In other words, the observer experiences the effect of depth or thickness in the transmitted images and a more realistic result is obtained than has heretofore been possible. To express this in other words, it may be stated that the picture transmitted to the observer produces the effect of a three dimensional object.

It is, of course, possible with this apparatus to transmit a flat picture when a flat picture is substituted for a physical object having thickness at the transmitting end. However, when a physical object having thickness or depth is scanned at the transmitting end, it is obvious that an identically similar effect is produced at the receiving end.

Although the invention has been described in considerable detail, it is to be understood that such description is intended as illustrative rather than limiting, as the invention may be variously embodied and is to be interpreted as claimed.

I claim:

1. A television apparatus comprising a pair of spaced photo-electric cells adapted to receive radiant energy from an object, scanning means associated with said cells, separate wireless transmitting means separately controlled from said cells, a pair of wireless receiving means respectively controlled by said transmitting means, a pair of spaced light producing means respectively controlled by said receiving means, scanning means associated with said light producing means, said light producing means being spaced apart a greater distance than the average distance between the eyes of the observer, and optical means for bringing the light from the two light producing means to two points spaced apart the average distance between the eyes of an observer.

2. The method of televising an object and producing a binocular effect comprising controlling electrical energy by light from an object received at two spaced points, translating the electrical energy into light at two points, spaced apart a greater distance than the distance between the eyes of an observer, and optically bringing the light from the last mentioned two spaced points to positions spaced apart approximately the distance between the eyes of an observer.

3. The method of televising an object and producing a binocular effect comprising receiving radiant energy from an object at two spaced points, translating the radiant energy into separate and distinct electrical impulses, translating said electrical impulses into light at points, spaced apart a greater distance than the distance between the eyes of an observer, and optically bringing the light from the last mentioned two spaced points to positions spaced apart approximately the distance between the eyes of an observer.

4. A television apparatus for producing binocular effects comprising transmitting and receiving devices, each of said devices having a pair of elements, scanning means associated with the elements of the transmitting device, a scanning means being associated with each element of the receiving device, an element of one pair being electrically controlled by an element of the other pair respectively, the elements of the transmitting device being light responsive elements, and the elements of the receiving device being adapted to control light, the elements of the receiving means being spaced apart a greater distance than the distance between the eyes of an observer, and optical means for bringing the light from the last mentioned elements to two positions spaced apart the average distance between the eyes of an observer.

In testimony whereof, the signature of the inventor is affixed hereto.

WILLIAM TURNOR LEWIS.