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R. D. KELL

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TRANSMISSION OF PICTURES

Filed March 20, 1928

Fig. 1.

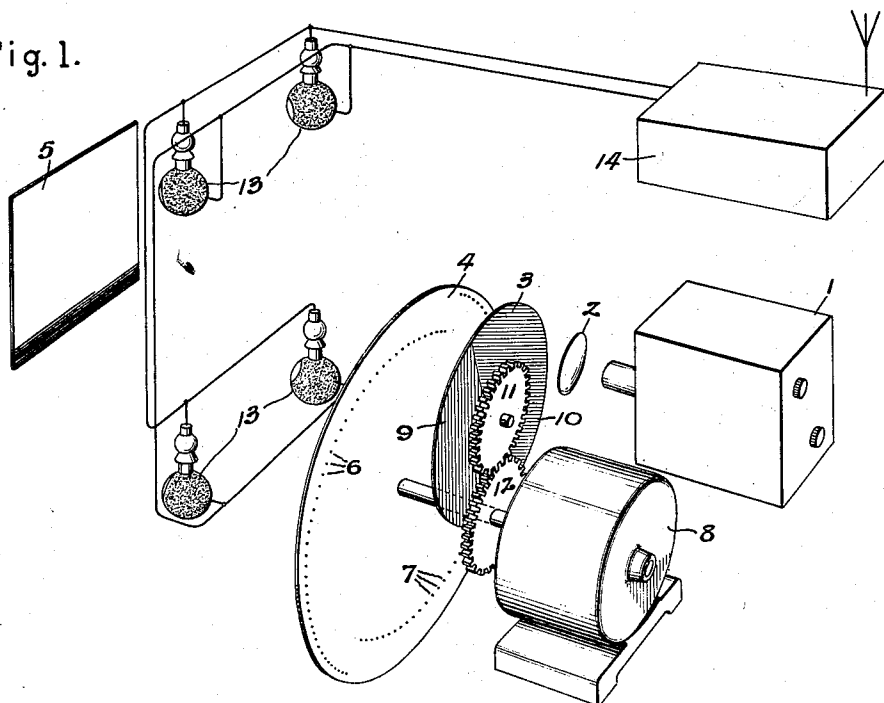
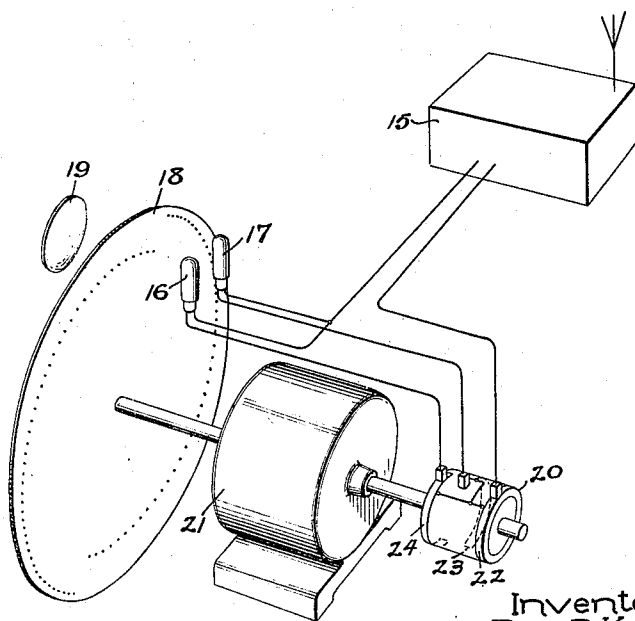


Fig. 2.



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UNITED STATES PATENT OFFICE

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TRANSMISSION OF PICTURES

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My invention relates to the transmission of pictures, and has for its principal object the provision of an improved apparatus and method of operation whereby polychromatic pictures may be readily transmitted from one place to another.

Various types of picture transmitting and receiving apparatus have been provided in the past. Many of these apparatus include a rotatable perforated disk or screen through the perforations of which light from a suitable source is projected upon successive elemental areas of the picture for the purpose of producing reflected light impulses having intensities dependent on the color of these elemental areas. In the operation of such apparatus these light impulses are converted into electrical impulses at the transmitting apparatus and at the receiving apparatus are reconverted into light impulses which are applied to a picture receiving member through a perforated disk similar to and rotated in synchronism with the rotatable disk of the transmitting apparatus.

As heretofore constructed, apparatus of the type described have been for the most part incapable of transmitting more than one color of the picture. It is frequently desirable however to transmit a picture having different colors. In accordance with my invention this result is produced by means of an improved apparatus whereby groups of alternate elemental areas of the picture are successively subjected to light of different color. Thus in the illustrated embodiment of my invention a plurality of elemental areas distributed over the complete picture are successively scanned or exposed to light of one color and thereafter a plurality of other elements interposed between these elements are successively exposed to light of another color. Under these conditions two complete pictures of different colors are transmitted and it has been found that, although the quality of these individual pictures may be poor, the quality of the received picture made up of the combination of the two is good due to the fact that the impression of a single polychromatic picture is produced at the receiver.

My invention will be better understood

from the following description when considered in connection with the accompanying drawings and its scope will be pointed out in the appended claims.

Referring to the drawings, Figs. 1 and 2 respectively illustrate picture transmitting and receiving apparatus wherein my invention has been embodied.

The picture transmitting apparatus illustrated by Fig. 1 includes a light source which is enclosed within a casing 1 and is arranged to project light through a lens 2, a multi-colored disk 3 and a perforated screen 4 upon a picture 5. It should be noted that the screen 4 is provided with two spiral-shaped groups of perforations 6 and 7 and is coupled to the shaft of a driving motor 8, and that the disk 3 is provided with different colored semi-circular segments 9 and 10 which are coupled to the shaft of the motor 8 through gears 11 and 12.

As will be readily understood, the relation between the groups of perforations in the screen 4 is such that light is transmitted through the perforations 6 to a group of elemental areas distributed over the entire surface of the picture and is transmitted through the perforations 7 to a group of elements which are also distributed over the entire picture but lie between the elements to which light is transmitted through the perforations 6. Thus if the screen 4 and disk 3 are rotated in opposite directions at the same speed, the light is applied to one group of elements of the picture through the segment 10 and the perforations 6 and to another group of elements of the picture through the segment 9 and the perforations 7.

The light impulses reflected from the picture 5 are received by the light sensitive elements 13 which convert them into electrical impulses. These electrical impulses are utilized to modulate the output current of a radio transmitter 14 through which they are transmitted to a radio receiver 15 connected to suitable different-colored lamps 16 and 17 from which light modulated in accordance with the transmitted impulses is projected through a perforated screen 18 and a lens 19. It will be apparent that

the screen 18 is similar to the screen 4 of the picture transmitting apparatus; that any suitable means may be utilized to maintain synchronism between the movable parts of the picture transmitting and receiving apparatus, and that the received picture may be either viewed on the lens 19 or projected on a screen (not shown).

In order that light of one color may be projected through one group of perforations in the screen 18 and light of another color may be projected through the other group of perforations, a commutator 20 is mounted on the shaft of the motor 21 which drives the screen 18. It will be observed that this commutator is provided with a slip ring 22 connected to one terminal of the radio receiver 15, with a segment 23 connected to the slip ring 22 and arranged to complete the connections of the lamp 17 while one group of perforations is passing the lamps, and with a segment 24 connected to the slip ring 22 and arranged to complete the connections of the lamp 16 when the other group of perforations is passing the lamps. Under these conditions alternate elemental areas of this picture are reproduced in colors corresponding to the color of the lamps 16 and 17.

The rapidity with which the different colored pictures are produced depends on the rotational speed of the screen 4. It has been found for example that the effect of a ninety-six line picture repeated twenty times per second is produced if the rotational speed is such that alternate pictures of forty-eight lines are produced at the rate of ten per second. As a result of this observation, it is believed that the impression of flickering is dependent not only on the rapidity with which the picture is repeated but also upon the angular difference from the eye of the parts illuminated at different instants of time.

The embodiment of the invention illustrated and described herein has been selected for the purpose of clearly setting forth the principles involved. It will be apparent, however, that the invention is susceptible of being modified to meet the different conditions encountered in its use and I therefore aim to cover by the appended claims all modifications within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. In an apparatus for transmitting pictures, the combination of means for producing light of different colors, a screen arranged to expose alternately different groups of elemental areas distributed over the surface of the picture, and driving means arranged to cause one group of said elemental areas to be exposed to light of one color and to cause another group of said elemental

areas to be exposed to light of another color.

2. In a picture transmitting apparatus, the combination of a disk provided with segments of different colors, a screen provided with different spiral-shaped groups of perforations, a source of light, and means arranged to cause light from said source to be alternately projected through one of said segments and one of said groups and through another of said segments and another of said groups.

3. In an apparatus for transmitting pictures, the combination of a member provided with segments of different colors, a screen provided with different groups of perforations, and driving means coupled to said member and said screen for causing the picture to be scanned alternately by a beam of light projected through one of said segments and one of said groups and by a beam of light projected through another of said segments and another of said groups.

4. In an apparatus for transmitting pictures, the combination of means for producing light beams of different colors, a screen provided with different groups of perforations, and driving means coupled to said screen for causing the picture to be scanned alternately by said beams of light, said groups of perforations being so arranged that one group of picture elements is scanned by one of said beams and another group of picture elements is scanned by another of said beams.

5. The method of picture transmission which includes alternately exposing one group of elemental areas distributed over the surface of the picture to light of one color, and exposing another group of elemental areas distributed over the surface of the picture to light of another color.

In witness whereof, I have hereunto set my hand this 19th day of March, 1928.

RAY D. KELL.