

July 22, 1941.

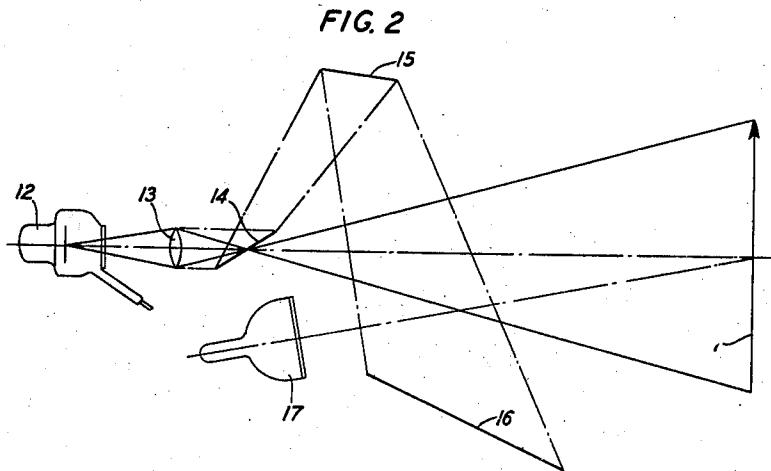
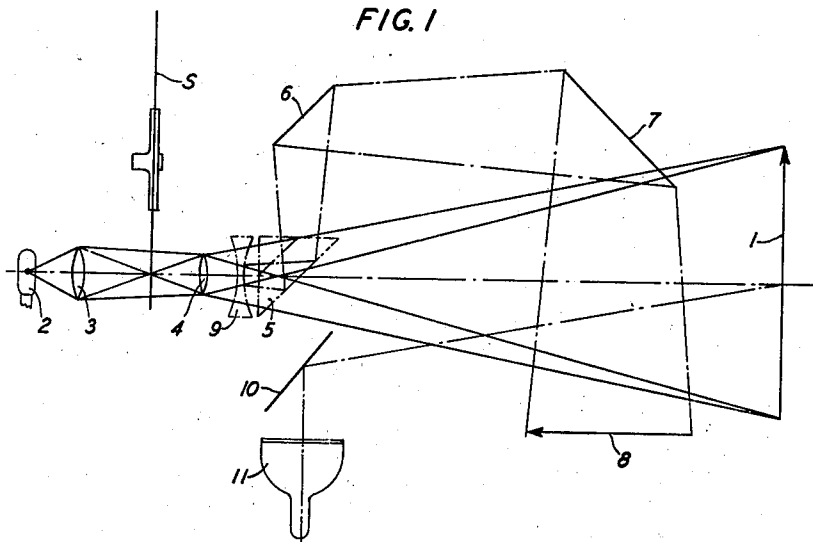
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2,250,169

TELEVISION TRANSMITTING DEVICE

Filed July 26, 1940

2 Sheets-Sheet 1



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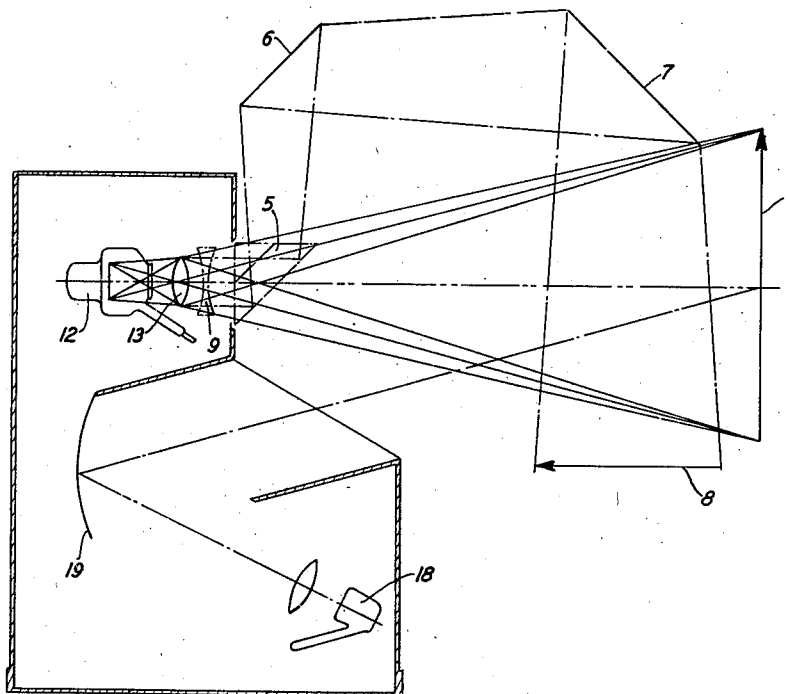
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2 Sheets-Sheet 2

FIG. 3



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TELEVISION TRANSMITTING DEVICE

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2 Claims. (Cl. 178—7.1)

The invention relates to the transmission of television images and particularly to optical arrangements used in connection with two way image transmission systems.

It is an object of the invention to provide means for televising the image of a person or of objects, written papers, sketches or drawings alternatively with one and the same transmitting device. It is a further object to provide a system in which alternatively a vertical view of a person or a horizontal view of the plane of a writing table or desk can be transmitted.

The television booths hitherto used have in common that the image of a person as seen in a vertical plane is scanned and transmitted to the receiver. The operation of such devices has proved that it is desirable to show printed matter, drawings or writings during the transmission to the other party of the television conversation. In order to effect the transmission of such matter it has been necessary to move the person out of the field of view of the transmitter and to hold the paper containing the writing vertically in the plane to be scanned. This is very inconvenient particularly if the party on the transmitting side intends to point out details on the paper by hand because it is difficult to have a free look upon the paper while it is being transmitted.

According to the invention a supporting plane is arranged within the booth in the field of view of the party preferably somewhat below the place where the received image appears. This supporting plane is used for placing thereon the sheet of paper containing the matter to be transmitted. The path of the light rays used for the transmission is deflected in such a manner that the supporting plane or an image thereof is scanned by the television transmitter. It is therefore possible to transmit alternatively a view of the person or a view of the objects placed upon the supporting plane. If, for example, a spot light scanner is used the path of the flying spot of light is deflected by a mirror or prism. In case an image transmitting tube is employed the image of the object upon the supporting plane or alternatively that of the person is projected upon the photoelectric cathode of the transmitting tube.

Other aspects of my invention will be apparent or will be specifically pointed out in the description forming a part of this specification, but I do not limit myself to the embodiment of the invention herein described, as various forms may be adopted within the scope of the claims.

Referring to the drawings

Fig. 1 shows an embodiment in connection with a scanning disc and

Figs. 2 and 3 show further embodiments of the invention in connection with a transmitting tube of the charge storage type.

In Fig. 1 the place of the person to be televised is represented by arrow 1. The plane of this arrow is scanned by a movable spot of light produced by a source of light 2, a condenser 3, a lens system 4 and a scanning disc S; the light reflected by the person is collected by photoelectric cells which are not represented in the drawing.

During the operation of this device a deflecting prism 5 together with a lens 9 may be moved into the path of the scanning light ray. The light rays are further reflected by mirrors 6 and 7 so that now the plane 8 is scanned. The prism arrangement can be operated by the person who is using the transmitter when it is desired to show to the partner situated on the receiving side an object which has been placed upon the plane 8.

The light reflected by the object is collected by photoelectric cells and the impulses produced therein are transmitted to the receiver. The photoelectric cells are arranged at suitable places of the booths. It may be preferable to use different groups of photoelectric cells for televising the person 1 and the plane 8. In this case it is preferable to actuate the photoelectric cells by means of switches which are operated during the movement of the prism arrangement 5.

The prism is arranged in such a manner that it can be moved easily and quickly into and out of the path of the light rays. The movement may be effected indirectly by pressing a button and moving the arrangement by means of a relay or an electromagnetic device. If the distance between the plane 8 and the lens system 9 is larger than that between plane 1 and the lens system 4 and if the depth of focus of the lens system 4 is not sufficient, the lens 9 is used for correcting the distance. A screen 10 is arranged directly below the path of the light rays upon which the image of the other partner is projected. This image is produced upon the screen of a cathode ray tube 11.

Fig. 2 shows an arrangement in which the image is scanned by means of a cathode ray tube of the charge storage type 12 and a lens system 13. A mirror 14 is arranged in front of the lens 13 and can be moved out of the path of light so that alternatively the plane of arrow 1 or a plane 16 is reproduced on the light sensitive electrode of tube 12. The path of light contains an additional mirror 15 between the plane 14 and 16.

If the object 16 to be televised contains readable matter it is necessary that the content appears in upright and correct position and is projected upon the photoelectric cathode of tube 12 in proper position. In the arrangement shown in Fig. 2 the image of the object in plane 16 has the correct position with regard to the vertical dimension but is reversed with regard to the horizontal dimensions. It is therefore necessary to actuate simultaneously with the movement of mirror 14 a switching arrangement by which this incorrect position is compensated, for example, by changing the direction of the line scanning movement.

The screen of the receiving tube 17 shows the image of the other partner. The tube 17 is arranged in such a manner that the received image appears between the opening of the scanning system and the supporting plane for the object to be televised. The path of light rays between the lens system 13 and the plane 1 is of the same length as that between the lens system 13, the mirror 15 and plane 16. The plane 16 contains preferably marks or lines for defining the field of view of the transmitter. The objects to be televised must be placed within the marked field.

Fig. 3 shows a further embodiment in which parts corresponding to those of the foregoing figures are designated with the same reference numerals. A lens 9 is moved together with the prism 5 into the path of the light rays. The receiving arrangement has the form of a projection receiver containing a projection screen 19 and a projection tube 18. The received image is projected from the screen of the tube upon

a screen 19 having a curved form. The receiving screen is arranged within a shielding device so that the light rays illuminating plane 1 and plane 8 cannot fall upon the receiving screen.

The additional lens 9 may be constructed in such a manner that only a small part of the plane 8 is reproduced on the photoelectric cathode. The images of objects placed in this plane are therefore seen with a better definition than the objects in plane 1.

What I claim is:

1. Apparatus for scanning objects in a vertical or horizontal plane comprising means for scanning an object in one of said planes, means for scanning another object in the other of said planes including stationary reflectors out of the optical scanning path of the first object, and a reflector movable into the optical scanning path of the first object cooperating with the first scanning means and said stationary reflectors for scanning the other object in the other of said planes.

2. Apparatus for scanning objects in a vertical or horizontal plane comprising means for scanning an object in one of said planes, means for scanning another object in the other of said planes including stationary reflectors out of the optical scanning path of the first object on the side of said path opposite the said other object, and a reflector movable into the optical scanning path of the first object cooperating with the first scanning means and said stationary reflectors for scanning the other object in the other of said planes.

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