Jan. 9, 1940. P. F. M. GLOESS 2,186,542

TELEVISION SYSTEM

Filed Aug. 12, 1937

Fig. 1.

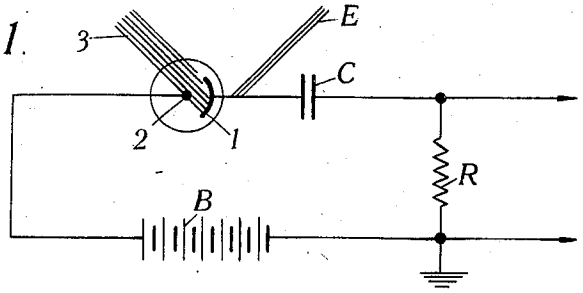


Fig. 2.

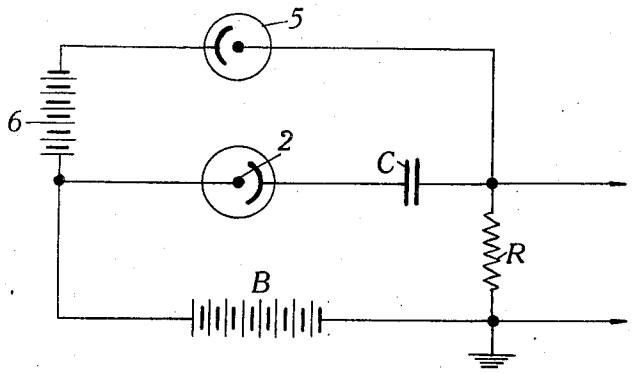
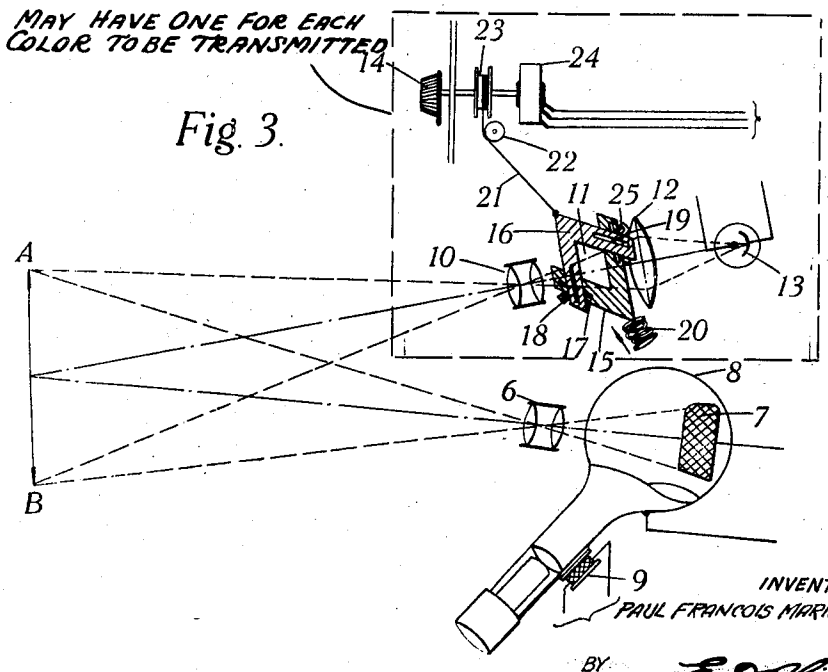


Fig. 3.



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TELEVISION SYSTEM

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2 Claims. (Cl. 178—5.2)

The present invention relates to systems or apparatus for television and has as one object the elimination of certain drawbacks which at present exist particularly in scanning apparatus employing electronic means.

It is known that in such apparatus frequencies lower than the frame frequency, and the so-called D. C. component representing the mean brightness of the image, are eliminated.

The present invention has, in particular, the object of controlling the currents emitted by an electronic or similar scanning system, while taking into consideration one or more mean characteristics of the scene or image to be televised. This result may be attained by combining either with or inside the electronic scanning tube, a device sensitive to the mean characteristic of the scene to be televised which it is desired to keep under consideration, the current produced by this device being combined with the currents proceeding from the electronic scanning device.

The invention is explained in more detail in the following description based on the accompanying drawing, in which:

Fig. 1 shows schematically an element of an electronic scanning system;

Fig. 2 shows schematically the electric circuit corresponding to an embodiment of the invention;

Fig. 3 shows the combination of devices employing features of the invention with an electronic scanning system.

Fig. 1 shows schematically how currents of very low frequencies cannot be transmitted by an electronic scanning system of the photo-electric mosaic type. In this figure, 1 represents one of the elements of a photo-electric mosaic of a tube in which scanning is effected by a cathode ray. Associated with this element or cathode 1 is an anode 2, common moreover to all the elements such as 1. The circuit of the mosaic element considered is completed by a polarising battery B and a resistance R at the terminals of which are collected the image signals. There falls on the cathode 1 a ray of light 3 proceeding from a point of the scene to be televised. The reaction of the ray of light 3 on the cathode 2 produces, in the well-known manner, an emission of photo-electrons. This emission of photo-electrons positively loads the condenser C and thus produces a slowly varying current in the resistance R. The same applies to all the elements of the mosaic and the corresponding currents are added in the resistance R.

At the moment when the cathode scanning ray E passes over the element of the mosaic under consideration, it suddenly discharges the condenser C and the corresponding discharge current also passes through the resistance R. The combination of these two currents practically eliminates the components of slow variations of the discharge current of the elements of the mosaic, which current corresponds to the mean illumination of the scene to be televised.

The embodiment shown schematically in Fig. 2 permits the complete image signal to be reconstituted, that is to say, up to and including the zero frequency. For this purpose a photo-electric cell 5 is employed, having as far as possible, a characteristic of sensitivity similar or corresponding to that of the mosaic employed. This cell 5 is associated with an optical system (not shown in Fig 2) adapted to receive in a given proportion the same total luminous flux of the scene to be televised as that received by the mosaic. This cell 5 is then associated with the elements of the mosaic in the manner shown in Fig. 2, that is to say, the cell 5 associated with a polarising battery 6 is connected, on the one hand, over the battery 6, to the anode 2 and, on the other hand, to the common electrode forming one of the armatures of the condenser C.

The operation of the unit shown in Fig. 2 is thus as follows: The auxiliary cell 5 produces in the resistance R currents of slow variation which are identical and of opposite direction to those produced by the simultaneous charging of all the elements of the mosaic. In this way the resistance R will no longer be traversed except by the discharge current of the elementary condenser of the mosaic and the potentials collected on the terminals of R will thus represent solely the image signals. It will also be noted that the device described permits the direct component of this current also to be transmitted since condenser C does not affect operation of cell 5.

Fig. 3 shows an embodiment of the invention in which the scene AB to be televised is projected by means of an objective 6 on the mosaic 7 of a cathode ray tube 8 provided with a deflector system for the scanning ray shown in the form of a coil 9 which deflects the cathode ray by means of the magnetic field which it produces. It is clear that other types of deflector systems may also be employed.

A second objective 10 projects an image of the same scene on a window 11 whose dimensions

may be adjusted in accordance with the portion of the scene which it is desired to televise.

Behind this adjustable window 11 is an optical condenser 12 concentrating the luminous bundle which has passed through the window 11 on a photo-electric cell 13 similar to the cell 5 shown in Fig. 2. The cell 13 is associated with the various elements of the mosaic in accordance with the manner shown in the case of the cell 5 on Fig. 2. The connection of the cell to the elements of the mosaic 7 and the resistance R has also not been shown in Fig. 3 in order not to complicate this drawing.

The dimensions of the opening of the window 11 and the position of this opening may be adjusted either automatically or by manual control. Fig. 3 shows, by way of example, a manual control of the opening of the window by means of an operating knob 14, this control being combined with the means for controlling of the amplitude of the sweep of the cathode ray. This window or diaphragm 11 is composed of two V-shaped elements, 15 and 16. These two elements are connected to each other by means of pins 19, sliding in slots, such as 17 and 18. These pins are movable along the diagonal of the figure formed by the two branches 15 and 16, which, in the example under consideration, is in the form of a square, and may also slide in a slide, such as 25, which permits the device to present to the objective 10 an opening which remains square, its dimensions thus being adapted to be varied as desired. The adjustment of the screen may be made in the following manner:—a spring 20 presses against the element 15 thereby forcing the element 16 to assume a particular position by virtue of the construction of the device previously described. The connection between the mechanical device and the manual control 14 is effected by means of a cable 21 connected to the element 16, passing over a pulley, such as 22, and winding on a drum 23. This drum may be mounted, for example, directly on the axle of the adjusting knob 14 and stops (not shown) may be provided in order to maintain the diaphragm at a particular opening.

On this same axle is mounted a potentiometer 24 which permits the deflection of the cathode scanning ray to be adjusted, for example, by the currents passing through the deflecting coils only one of which, 9, is shown in Fig. 3. This adjustment is performed so that the portion of the mosaic 7 scanned by the cathode ray corresponds to the size of the opening of the window 11 and, consequently, to the chosen portion of the scene to be televised.

The arrangement shown in Fig. 3 permits the application of the invention even in the case in which the amplitude or deflection of the scanning ray is caused to vary, particularly in order to obtain scenic effects on the screen of the receiver.

The invention which has been described in its application to television may also be employed for similar applications such as, for example, in facsimile transmission systems.

The invention is obviously not limited to the embodiments described which may undergo numerous modifications without departing from the limits of the invention, thus instead of a single additional photo-electric cell, several may be provided.

Although the embodiment described only serves to take into consideration the mean illumination of the scene or image to be televised, it is clear that the invention is not limited to this particular case and that, for example, for the transmission of television in colour several compensating photo-electric cells, such as 5, might be employed, for example one cell for each fundamental colour of the image.

What is claimed is:

1. A television transmitting system comprising an electronic scanning photo-electric device for scanning an image of a field of view, an auxiliary photo-electric device responsive to the average light value of said field of view, an adjustable window in front of said auxiliary device for defining the area of the field of view which is projected upon said auxiliary device, and means for simultaneously adjusting the aperture area of said window and the amplitude of sweep of the cathode ray of said photo-electric device first mentioned.

2. A color television system wherein a separate transmitting arrangement according to claim 1 is utilized for each fundamental color to be transmitted.

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