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TELEVISION TRANSMITTING APPARATUS

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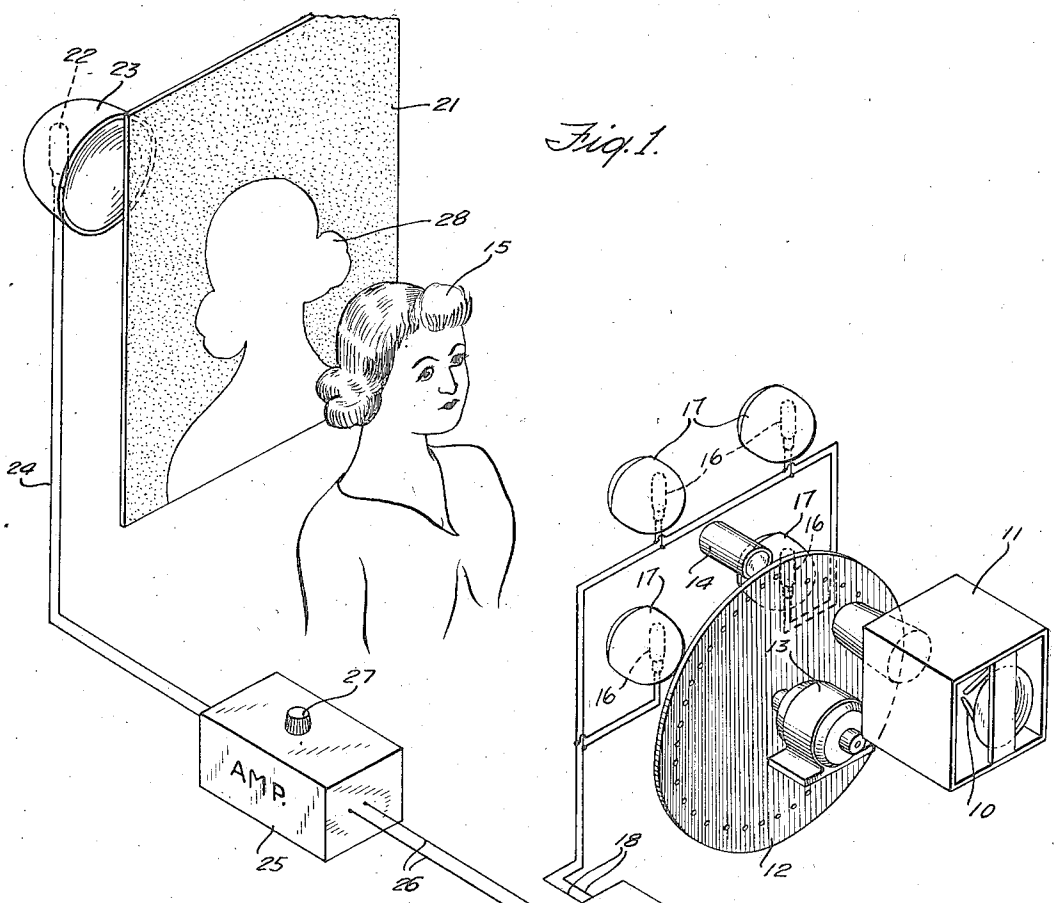


Fig. 1.

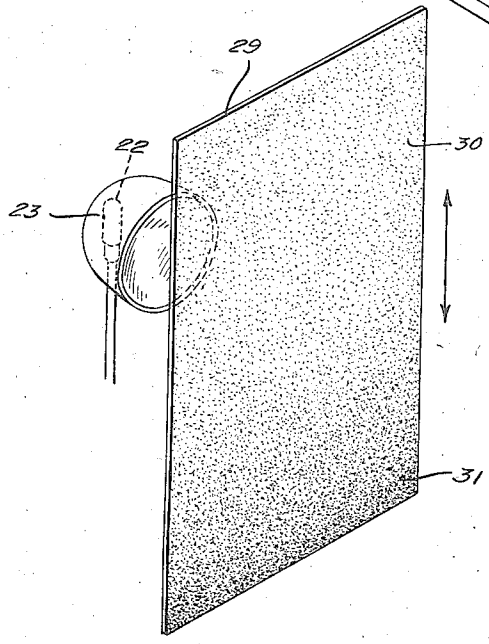


Fig. 2.

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TELEVISION TRANSMITTING APPARATUS

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14 Claims. (Cl. 178—6)

This invention relates to television transmitting apparatus and especially to a system in which the picture is scanned in successive lines.

One of the objects of the invention is to provide a transmitting system in which the illumination of the background of the reproduced picture may be controlled.

Another object of the invention is to provide a separate light-sensitive cell or cells with a suitable amplifier therefor directly in front of the scanning apparatus to operate from the projected light of the so-called "flying spot" instead of by reflection.

Other objects of the invention will be apparent as the description of the invention proceeds.

The invention is illustrated in the accompanying drawing in which:

Fig. 1 is a diagrammatical representation of a transmitting system arranged in accordance with the invention; and

Fig. 2 is a diagrammatical representation of a modified form of the controlling means for the light-sensitive cell used to pick up the background light.

Referring more specifically to Fig. 1, a conventional "flying spot" scanning apparatus is shown in which light from an arc lamp 10, mounted in a suitable housing 11, is directed against a scanning disc 12 which is run at a constant speed by a suitable synchronous motor 13. An optical system 14 projects light coming through the scanning disc on to the object 15 to be scanned. A plurality of light-sensitive cells 16, mounted preferably in light converging reflectors 17, pick up the reflection of the light falling upon the object 15 in a manner well known in the art, the cells being connected by wires 18 to an amplifier 19 and thence by means of wires 20 directly to the receiving apparatus (not shown) or to suitable broadcasting apparatus for broadcasting the picture signal.

The operation of the scanning disc, which may be similar to the well known Nipkow disc causes a single spot of light at a time to cross the object field in a horizontal line, striking the object to be televised and actuating the light-sensitive cells by reflection from the surface thereof. When one spot has moved across the object another spot follows thus completely scanning the object.

It has been the usual practice to stand the object to be televised up against a screen so that the spot sweeping across the object field crosses not only the object to be televised but the background screen as well, and the reflection from this background screen produces the background for the reconstructed picture. In the present invention I provide a background screen 21 of ground glass or other translucent material and behind this screen I position one or more light-sensitive cells 22 mounted, if desired, in suitable reflectors 23 and connected by wires 24 to an independent amplifier 25 whose output may be connected to the amplifier 19 by means of the wires 26. A suitable control knob 27 permits the output of the light-sensitive cells 22 to be adjusted as desired.

During the operation of my improved system the object to be scanned is positioned in a dark room in front of the background screen 21. The only light reaching the object is the "flying spot" of light from the scanning apparatus. It will be evident that when the spot of light is on the object there is no light falling on the background screen 21, but when the light passes off one side of the object so that the object is no longer in the path of the projected ray it will fall directly upon the screen, providing, of course, that the object is smaller than the object field covered by the "flying spot". When the apparatus is operating, therefore, the actual appearance of the background screen 21 is as indicated in the figure, the shadow 28 of the object appearing on the screen.

Whenever the light spot is on the object the light-sensitive cells 16 will respond, getting their light by reflection, and whenever the light is on the screen 21 outside of the shadow 28 the cells 22 will respond while the cells 16 give no response or very little. As the output of the cells 22 may be independently controlled by the knob 27 on the amplifier 25 its effect on the reproduced picture may be controlled and the character of the background may be adjusted as desired from very bright to almost black if the function of the cell is cut down low enough.

This effect may also be varied by the distance the screen 21 is positioned from the object being televised. If it is close to the object, the cells 16 will receive background light by reflection similarly to the manner in which they have functioned heretofore, while if it is placed far enough away the reflected light to the cells 16 may be practically eliminated. But the projected light of the "flying spot" will always be strong enough on the ground glass to affect the operation of the cells 22.

The invention provides a very flexible control system which permits changing the character of the background while the picture is being transmitted. If the received image of a face, for instance, tends to blend with a shadowy background,

the background may be brightened and the face brought out in contrast by increasing the output signal from the amplifier **25**, and in case the character of the scene changes as where the person moves out of the picture or several persons suddenly move back into it the background may be immediately adjusted to meet the requirements without disturbing the physical set up.

In Fig. 2 is shown a means whereby the effect of the light cell may be controlled mechanically instead of electrically. Here a glass plate **29** is shown positioned in front of the cell **22**. This glass is completely transparent at its upper end **30** but is darkened towards its lower end **31** where it is completely blackened. By moving the glass plate up and down in front of the cell it is possible to prevent any of the light from entering the cell or to permit as much light to affect it as desired.

While one light cell has been shown behind the background screen **21** it will be evident that any number of cells may be used for this purpose and that the cells may be positioned in any desired manner, it being desirable, however, that they be influenced by all of the light striking the screen **21** and for this reason the screen **21** should be made of a highly diffracting material. Ground glass having a fine uniform surface is suitable for this purpose. It is also understood that any number of light-sensitive cells may be used in front of the object, and that these cells may be connected in any desirable way, and that any type of scanning apparatus be used for projecting the swiftly moving spot of light upon the object to be televised. A translucent screen with cells behind it may be preferred but a white diffusing screen may be used with the cells facing the front of it.

The invention has thus far been described in connection with a "flying spot" system of transmission but is applicable also to one in which the object is illuminated and the light-sensitive cell is positioned where the arc light is shown in Fig. 1. The light-sensitive cells **16** and **22** would then be replaced by lights which would illuminate the object and translucent background screen respectively. In this case also the adjustment of the light upon the screen will control the illumination of the background.

With the arrangement just referred to the background screen may also be a white diffusing screen independently illuminated by lights in front of it.

In view of these and other changes which may be made I do not desire to limit myself to the specific construction shown and described except as such limitations occur in the appended claims.

What I claim is:

1. A television transmitting system comprising a light source, means to direct the light from said source in a series of moving spots of light across the object to be televised, a light-sensitive cell positioned so as to receive light reflected from said object, means to amplify the impulses received by said cell, and means behind said object to intercept the light from said light directing means except that intercepted by the object and to translate said light into electrical impulses.

2. A television transmitting system comprising means for creating a flying spot of light across an object field, a light-sensitive cell positioned so as to receive light from said spot reflected from an object to be televised, and a light-sensitive cell behind said object to be televised and positioned in such a manner as to receive all light within the object field of said flying spot which is not intercepted by said object.

3. A television transmitting system comprising means to create a flying spot of light across an object field of predetermined area, a light-sensitive cell so positioned that it will receive light from said flying spot reflected from an object placed within the area of said object field, means to amplify the impulses set up by said cell, a light-sensitive cell positioned behind said object, means to direct into said cell all of the light traversing said object field except that intercepted by said object, and means to amplify the impulses set up by said last mentioned cell.

4. A television transmitting system comprising means to create a flying spot of light across an object field of predetermined area, a light-sensitive cell so positioned that it will receive light from said flying spot reflected from an object placed within the area of said object field, means to amplify the impulses set up by said cell, a light-sensitive cell positioned behind said object, means to direct into said cell all of the light traversing said object field except that intercepted by said object, means to amplify the impulses set up by said last mentioned cell, and means to alter the effect of said last mentioned cell.

5. A television transmitting system comprising means to create a flying spot of light across a predetermined object field, means to translate variations of light and shade reflected from an object placed in said object field into electrical impulses, means to amplify said impulses, means within said object field to translate the direct light of said flying spot into electrical impulses, means to amplify said impulses, and means to direct all of the light within said object field except that intercepted by said object into said last mentioned translating means.

6. A television transmitting system comprising means to create a flying spot of light across a predetermined object field, means to translate variations of light and shade reflected from an object placed in said object field into electrical impulses, means to amplify said impulses, means within said object field to translate the direct light of said flying spot into electrical impulses, means to amplify said impulses, means to direct all of the light within said object field except that intercepted by said object into said last mentioned translating means, and means to adjust the output of said last mentioned translating means.

7. A television transmitting system comprising a translucent screen, means to create a flying spot of light across said translucent screen, means to translate variations of light and shade reflected from an object placed between said screen and said means into electrical impulses, and a light-sensitive cell positioned behind said screen in such a way as to respond to light falling on any portion of said screen.

8. A television transmitting system comprising a translucent screen, means to create a flying spot of light across said translucent screen, means to translate variations of light and shade reflected from an object placed between said screen and said means into electrical impulses, a light-sensitive cell positioned behind said screen in such a way as to respond to light falling on any portion of said screen, and means to control the output of said last mentioned cell.

9. A television transmitting system comprising means to translate the light and shade values of an object field successively in a series of scanned lines into electric impulses, means to control the strength of the impulses received

from an object placed within said object field, and means to independently control the impulses produced from the background of the object field.

10. A television transmitting system comprising means for creating a flying spot of light across an object field, a light-sensitive cell positioned so as to receive light from said spot reflected from an object to be televised, a second light-sensitive cell behind said object to be televised and positioned in such a manner as to receive all light within the object field of said flying spot which is not intercepted by said object, and means to combine the impulses of said cells to form one television signal.

11. A television transmitting system comprising means for creating a flying spot of light across an object field, a light-sensitive cell positioned so as to receive light from said spot reflected from an object to be televised, a second light-sensitive cell behind said object to be televised and positioned in such a manner as to receive all light within the object field of said flying spot which is not intercepted by said object, means to combine the impulses of said cells to form one television signal, and means to adjust the ratio of the output of said cells.

12. A television transmitting system comprising means to create a flying spot of light across a predetermined object field, means to translate variations of light and shade reflected from an object placed in said object field into electrical impulses, means to amplify said impulses, means within said object field to translate the direct light of said flying spot into electrical impulses, means to amplify said impulses, means to direct all of the light within said object field except that intercepted by said object into said last mentioned translating means, and means to combine both of said impulses into a single television signal.

13. A television transmitting system comprising, in combination, a translucent screen in front of which the object to be televised may be positioned, means to translate the light values of said screen and object successively in a series of scanned lines into electrical impulses, means to control the strength of the impulses received from said object, and means to independently control the impulses produced from that part of said screen which forms the background for said object.

14. A television transmitting system comprising, in combination, a screen in front of which the object to be televised may be positioned, means to translate the light values of said screen and object successively in a series of scanned lines into electrical impulses, means to control the strength of the impulses received from said object, and means to independently control the impulses produced from that part of said screen which forms a background for said object.

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