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TELEVISION TRANSMITTING SYSTEM

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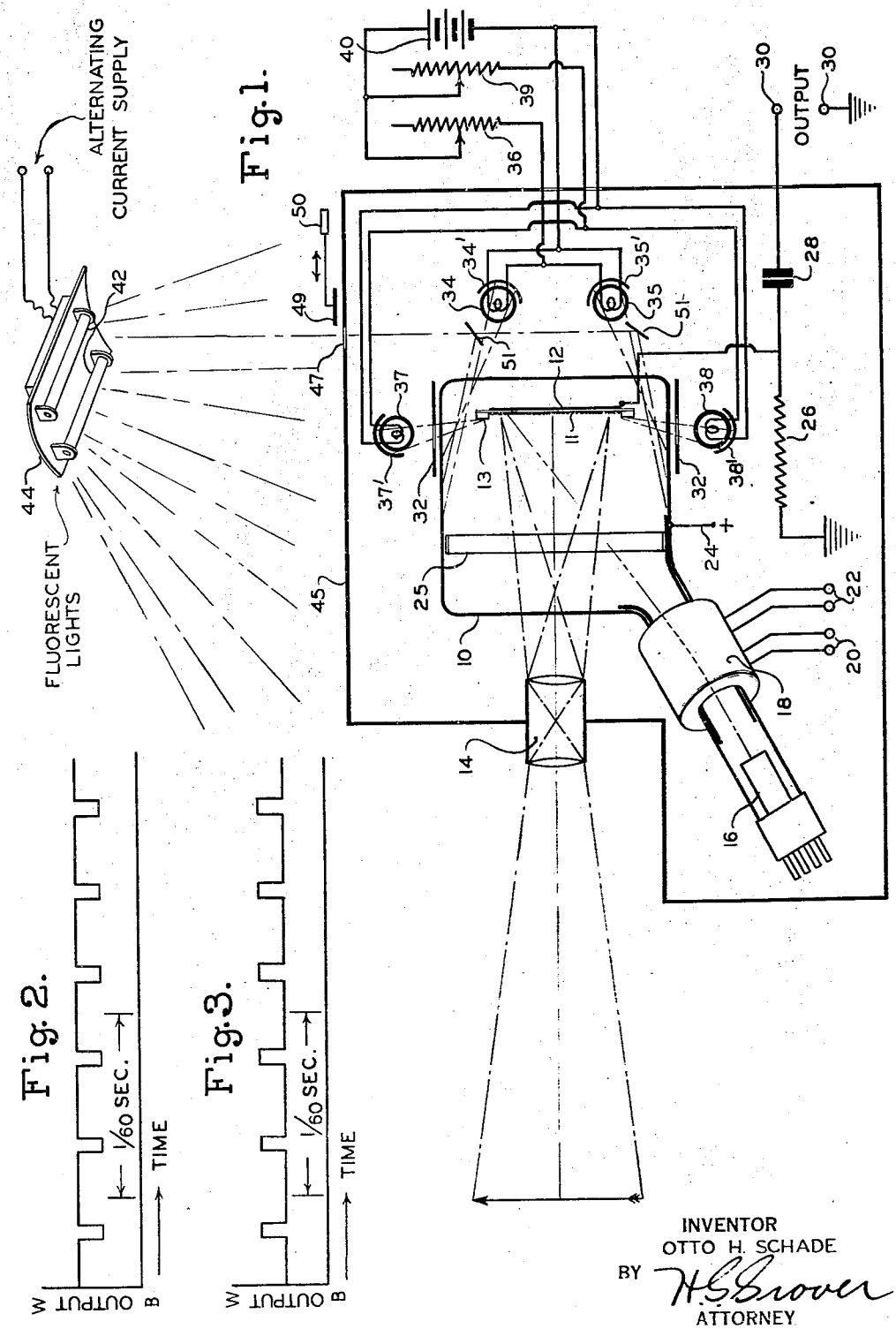


Fig. 1.

Fig. 2.

Fig. 3.

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TELEVISION TRANSMITTING SYSTEM

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This invention relates to an improvement in television transmitting systems and more particularly to a system to be used in a television transmitting studio whereby fluorescent lights may be used to replace more conventional incandescent or arc lamps used for general or special illumination.

Since a television transmitting tube is a light responsive device, it is desirable that the light provided in the studio be as near constant as possible. Should any cyclic variation in the intensity of the lighting be present, this variation will become apparent at the television receiver to cause stationary or moving light or dark bands across the reproduced image, depending upon the rate of the cyclic variation as compared with the rate of vertical or horizontal reflection of the cathode ray beam in the television transmitting tube. For this reason incandescent lamps have been used as a source of lighting in a television transmitting studio, the incandescent lamps being of a relatively high power or high wattage in order to reduce the amount of flicker to a minimum, the reduction being the result of the inherent thermal lag in a relatively heavy incandescent lamp filament.

It would be desirable to use fluorescent lighting in a television transmitting studio, since such lighting would have two major advantages, namely, a marked reduction in the amount of produced heat and, furthermore, the spectrum of the light produced in the studio could be more readily controlled by the choice of the particular fluorescent materials used in the construction of the various fluorescent lights employed. Fluorescent lighting, however, has the disadvantage of producing light intermittently when operated from an alternating current source, since the light from a single alternating current operated fluorescent lamp increases from the point of ignition to a maximum at the center of the half cycle and then decreases to the point of extinction. The variation in this range is not particularly large because the current reactor normally connected in series with fluorescent lamps tends to maintain substantially constant current when the lamp is energized from an alternating current source; however, the current must necessarily pass through zero during which time there is no current flow to excite the fluorescent materials on the inside of the fluorescent lamp. The light from the fluorescent lamp does not decrease to zero during the interval of zero current because of phosphorescence, but the decrease in the amount of light produced by the lamp is appreciable and unless some means are provided for compensating for the variation in light output from a fluorescent lamp undesired effects will be produced on the screen of the television receiving tube.

It is true that multi-phase alternating power circuits may be used, and it is also true that phase splitting devices may be used; however, in spite of the use of such devices, the fluctuation in the light output from the various lamps still persists and substantially the effect resulting from the use of multi-phase power circuits and phase splitting devices is that of increasing the frequency of the intervals during which the amount of produced light is reduced. Although the percentage of reduction in light is decreased during these intervals, the reduction is still sufficiently apparent and sufficiently effective to produce an undesired result.

It is, therefore, one purpose of the present invention to provide an arrangement whereby the subject matter to be televised in a television studio may be illuminated by fluorescent lights from an alternating current source.

Another purpose of the present invention resides in the provision of means whereby fluorescent lighting may be used in a television studio when only a single phase source of alternating current is available.

Still another purpose of the present invention resides in the provision of means whereby fluorescent lighting may be used in a television studio, the fluorescent lamps being energized from an alternating current source without the introduction of the usual undesirable light and dark bands across the screen of the television receiving tube.

Other purposes and advantages of the present invention may become more apparent to those skilled in the art by the following detailed specification and claims, particularly when considered in connection with the drawing wherein

Figure 1 represents schematically a television transmitting pick-up tube and associated elements;

Figures 2 and 3 show curves representing current output to be used in explaining the operation of the present invention.

Referring now to the drawing and particularly to Figure 1 thereof, there is shown a television pick-up tube 10 having a mosaic electrode 11 with which is associated a signal plate 12. An optical image to be scanned is focused upon the mosaic electrode 11 by means of the lens system 14. The television pick-up tube also includes an electron

gun structure 16 and an electro-magnetic deflecting coil 18. The deflecting coil includes at least a pair of windings for horizontally and vertically deflecting the cathode ray beam produced by the gun structure 16. The horizontal deflecting potentials may, for example, be applied to the terminals 20, whereas the vertical potentials may be applied to the terminals 22.

In order that a properly focused cathode ray beam may be generated a second anode, generally in the form of a conducting coating, is provided on the inside surface of the neck of the tube. A potential positive with respect to the cathode of the gun structure is applied to terminal 24. A collecting ring 25 is positioned around the inside surface of the television pick-up tube, and this ring is connected to the second anode coating and to the terminal 24.

The signal plate of the mosaic electrode is connected to grid through load resistance 26, and the picture signals produced by the pick-up tube are available to the output terminals 30, one of these terminals being connected to ground, and the other being connected to the signal plate by way of condenser 28.

The television transmitting tube is also provided with a light shield 32 which is positioned around that portion of the pick-up tube containing the mosaic electrode. This shield is opaque and is provided with a plurality of apertures through which light may be projected onto the interior of the pick-up tube and onto the mosaic electrode.

For providing a source of light, incandescent lamps 34 and 35 are shown, and these lamps are positioned at the back of the television pick-up tube. The lamps 34 and 35 project light around the edge of the mosaic electrode to permit a certain amount of actinic radiation to effect the photo-sensitive wall of the pick-up tube.

Additional incandescent lamps 37 and 38 are also provided for affording a certain amount of "edge lighting" to the mosaic electrode, these lamps being positioned so as to project light through appropriately provided apertures in the light shield member 32 onto the edge 13 of the mosaic electrode 11.

Means are provided for controlling the illumination of lamps 34 and 35 as well as lamps 37 and 38. The variable resistance 36 controls the amount of energy supplied to lamps 34 and 35 from the source of potential 40, whereas the variable resistance 39 controls the amount of current permitted to flow through the lamps 37 and 38.

A source of lighting comprising a plurality of fluorescent lamps 42 is provided having appropriate reflectors 44. These lamps are energized from an alternating current supply and include in conjunction therewith the usual starting switch and ballast reactor. The fluorescent lights are naturally positioned in the desired position in the television studio so as to illuminate the particular field of action. Naturally, it is preferable to position the lamps such that they will not project light directly upon the focusing lens system 14 of the television camera.

In order to protect the television pick-up from extraneous light the tube is housed in a light-tight casing generally indicated at 45. This casing is the usual camera housing and normally includes a television picture signal pre-amplifier as well as other necessary elements which are preferably directly associated with the television pick-up tube. Furthermore, certain adequate optical focusing and view finding apparatus is also included in the television camera.

The housing of the television camera is also provided with a light aperture 47 together with a cover member 49 and an operating member 50. Through the operating member it is possible to cover or uncover the light opening 47 in the television camera housing to permit a regulated amount of light to fall on the inside surface of the pick-up tube by reflection from the mirror surface 51. The purpose of the light opening will be described later.

In the construction of a television pick-up tube, such as the "Iconoscope," the mosaic electrode, its support and the signal plate are mounted in the tube and then the surface of the mosaic electrode is sensitized so as to be responsive to light energy. Normally the mosaic includes a mica support base upon one side of which silver globules of elemental area are formed by reducing particles of silver oxide dusted over the mica. The silver globules may as a matter of fact be formed by other methods, and it is immaterial what method is used so long as a great number of individual globules are produced. After the silver oxide is dusted over the mica, the electrode is subjected to a heat treatment so that the silver globules that are reduced from the oxide will not coalesce but will form individual isolated droplets. The back surface of the sheet of mica forming the base or support is coated with a conducting opaque metallic film (such as "aquadag," etc.) which serves as the signal plate 12 and which is connected to the load resistance 26 and to the output terminal 30 through condenser 28.

As stated above, the individual silver droplets are photo-sensitized after the mosaic has been mounted in the tube and the tube evacuated. The sensitization is similar to that used in the ordinary caesium photo-cell. That is, the silver is oxidized, exposed to caesium vapor and then heat treated.

The mica or support base on which the silver droplets are mounted serves to insulate them from one another and from the signal plate. Furthermore, the mica is made thin enough so that the capacity between each globule and the metallic signal plate will be reasonably large. The uniformity of cleavage sheets of mica together with their excellent insulating properties and low dielectric hysteresis loss make them very suitable for this purpose. Other insulating material, however, may be used as a support base, such as for example, thin ceramics or insulated conducting sheets. An edge area or frame 13 is usually provided around the mosaic, the frame being of conducting material and also having a light responsive or photo-electric surface. This edge or frame supplies electrons to the peripheral portion of the mosaic when subjected to light from lamps 37 and 38. The necessary potential of the frame is maintained in turn by photo-emission from the wall area due to lamps 34 and 35 in addition to the electrons from the mosaic target.

During the sensitization step naturally a certain amount of the caesium vapor is deposited upon the inside wall surfaces of the television pick-up tube. The inside surface of the tube, therefore, and particularly those portions relatively adjacent, are light sensitive, and when subjected to light irradiation will emit photo-electrons. During the construction of the tube, however, an effort is made to direct the caesium va-

pors, particularly upon the surface of the mosaic electrode.

Each silver globule making up the mosaic is photo-sensitized so that when a light image is projected upon the surface of the mosaic the light causes electrons of a number proportional to the light brilliance to be emitted from each illuminated minute size photo-sensitive area. The resulting loss of electrons leaves each photo-sensitive area at a positive potential without respect to its initial condition, which potential is then proportional to the number of electrons which have been released and conducted away so that the mosaic tends to go positive at a rate proportional to the light falling on it. As the electron beam scans the mosaic it passes over each element in turn releasing the charge it has accumulated and driving it to equilibrium. Due to the fact that each element is coupled by capacity to the signal plate the sudden change of charge of the elements will induce a change in charge on the signal plate and result in a current pulse in the signal lead including the load resistance **26**. The magnitude of these pulses will be proportional to the intensity of the light falling on the scanned element. Thus, the signal output from the "Iconoscope" will consist of a chain of current pulses corresponding to the light distribution over the surface of the mosaic.

A number of factors complicate this seemingly straight forward cycle. Among the most important of these complicated factors are the potential distribution over the mosaic, the redistribution of secondary electrons emitted from the element under bombardment and the emission of photo-electrons from the inside surface of the wall of the pick-up tube. If the average potential of the mosaic is measured in darkness while it is being scanned it will be found to be between zero and one volt negative with respect to the electrode which collects the electrons leaving the mosaic. Referring to Figure 1, this potential would be measured between the mosaic electrode **11** and the collector ring **25** (the latter being connected to the second anode terminal **24**). However, this potential is not uniform over the surface of the mosaic. Elements directly under the beam are found to be in the neighborhood of three volts positive with respect to the collector ring or second anode, whereas elements which have previously been bombarded have a potential less positive. At a point one-quarter to one-third of the vertical distance along the mosaic from the point being scanned the potential reaches a value of one and one-half volts negative with respect to the collector ring **25**, and the remainder of the mosaic electrode will be found to be at this latter negative potential. The positive potential of the mosaic directly under the scanning beam is a result of secondary electron emission, whereas (under conditions of darkness) the gradual change from a positive potential to a potential of one and one-half points negative is a result of the re-distribution of the produced secondary electrons which are rained upon the mosaic and which are not collected by the collector ring **25**.

When an optical image is projected upon the mosaic electrode and the mosaic is simultaneously and cyclically scanned by a cathode ray beam the elements of the mosaic do not attain a final potential of approximately one and one-half volts negative with respect to the collector ring or second anode **25**. Due to the fact that a light image is projected upon the mosaic electrode photo-electrons will be emitted therefrom with the result that the individual elements of the mosaic become less negative and may in fact be slightly positive with respect to the second anode depending upon the intensity of the light projected on the mosaic electrode.

Having now described the operation of an "Iconoscope," the theory underlying the present invention will now be described. It has been found that if the light from the fluorescent illumination sources **42** is permitted to fall upon the inside surface of the wall of the "Iconoscope" (as through the use of mirror **51**), and no beam is produced in the "Iconoscope" for scanning the mosaic electrode, the net photo-electron emission from the tube wall and from the mosaic surface will cause a "black" signal to be produced during the time that a minimum amount of light is produced by the fluorescent lamps. A curve showing the signal output from an "Iconoscope" under such conditions is shown in Figure 2. Figure 2, therefore, represents the signal output available from terminals **30** when no scanning action takes place in the "Iconoscope" and when light is permitted to fall upon the mosaic electrode through lens **14** and when some light is in addition permitted to fall upon the inside wall of the "Iconoscope" through the opening **47** in the pick-up tube housing **45** from the fluorescent lighting sources **42**. Bias lighting from the back of the mosaic through excitation of lamps **34** and **35** or from the edge of the mosaic through excitation of lamps **37** and **38** tends to increase the intensity of the black signal impulses, because such lighting controls to some extent the effective collector potential due to superposition of photo-current between the wall of the tube and the mosaic electrode. These black signal impulses as derived from the output terminals **30** occur each time the current through the fluorescent lights passes through zero. On a single phase power supply with no phase splitting circuits two black signal impulses will be derived for each cycle of alternating current.

When the mosaic is scanned by an electron beam the signal polarity as derived from the output terminals **30** reverses because of secondary electron emission currents greater than the primary beam current. In the absence of photo-electronic current from the tube wall (as in the condition of complete darkness on the wall of the tube) the signal output due to the fluorescent light illumination, therefore, includes "white" impulses as indicated in Figure 3. Figure 3, therefore, shows a curve of the signal output available at terminals **30** when the mosaic is illuminated from a fluorescent source and when the mosaic is scanned by a cathode ray beam but when no light from the fluorescent source is permitted to pass through the opening **47** onto the inside wall surface of the television pick-up tube.

Because of this potential reversal in the output signal available at terminals **30** the dark signal impulse from the inside wall of the "Iconoscope" pick-up tube (which is not bombarded by beam current) can be utilized to cancel or compensate the undesired white signal that is obtained directly from the mosaic. Two facilities, therefore, are available for assuring proper and complete compensation and for eliminating any undesired effects because of the use of fluorescent lighting: These facilities are, namely, an adjustment of the direct current bias lighting (from lamps **34**, **35**, **37** and **38**) or an adjustment of the amount of light permitted to fall upon the inside surface of

the television pick-up tube through the opening 47 from the fluorescent lights 42. An adjustment of the cathode ray beam current intensity can also be used to assist in producing the desired balance.

It is possible to exercise the present invention without the use of the opening 47 in the housing surrounding the television pick-up tube, since a signal of a predetermined intensity may be derived from the tube wall as a result of light being projected upon the target from the lens and by light directly from the lens to the tube wall. This signal of predetermined intensity may be exactly balanced by properly adjusting the intensity of the direct current bias lighting through an adjustment of resistances 36 and 39. The bias lighting equalizes the relative photo-electric currents from the mosaic and the tube wall due to potential changes. It may be desirable, however, to provide the opening 47 and an adjustable shutter means 49 so that the amount of light reflected (by 51) onto the inside wall of the tube directly from the fluorescent lights 42, or light bearing a direct relation to the average light of the scene, may be made adjustable. In actual practice complete cancellation of the undesired flicker signal can be accomplished by either or both of the above described methods without in any way affecting or impairing the useful picture signals.

It is apparent that the bias lighting method of compensation depends to some extent on the scene brilliance beyond the area illuminated on the mosaic, since this area furnishes part of the illumination of the tube wall either directly or by reflection. Accordingly, a change in the camera position may require a readjustment of the bias light intensity particularly where the change in camera position naturally affects the amount of light projected upon the mosaic electrode. Baffling of the lens may eliminate this change provided the photo-sensitivity or the affected area of the tube wall is sufficiently large to operate on light reflected from the mosaic only.

Naturally in the absence of some compensating arrangement fluorescent lighting can satisfactorily be used in a television studio by reason of the fact that the light produced will be found sufficiently constant in intensity. The arrangement described above, therefore, permits the use of fluorescent lighting in a television studio and also permits desired picture signals to be produced which are completely devoid of the usual undesired impulses that normally result from the use of fluorescent lights. An adjustment of the size of the opening 47 in the housing 45 surrounding the "Iconoscope" or by an adjustment of the intensity of the back lighting or by both complete compensation and illumination of the undesired signals may be accomplished.

Various other alterations and modifications of the present invention may become apparent to those skilled in the art from the foregoing description, and it is desired that any and all such modifications be considered within the purview of the present invention except as limited by the hereinafter appended claims.

I claim:

1. A television transmitting system including a television pick-up tube and a source of fluorescent light energized from an alternating current source for illuminating the subject to be televized, a housing surrounding said pick-up tube, said tube including a photo-sensitive target electrode and a photo-sensitive coating on a portion of the inside wall of the tube, means for projecting an optical image of the subject to be televized upon said target electrode, means to scan said target electrode by a cathode ray beam to produce television image signals, and means for directing a predetermined and adjustable amount of light from the fluorescent light source upon the photo-sensitive coating on the inside wall of the tube to thereby compensate for the undesirable cyclic variation in the strength of the image signals produced by the scanning operation due to the inherent intermittent production of light by the fluorescent light source.

2. A television transmitting system including a television pick-up tube of the storage type and a source of fluorescent light energized from an alternating current source for illuminating the subject to be televized, an opaque light housing surrounding said pick-up tube, said tube including a photo-sensitive mosaic electrode and a photo-sensitive coating on a portion of the inside wall of the tube, means including an optical system for projecting a focused optical image of the subject to be televized upon said mosaic electrode, means to scan said electrode by a cathode ray beam in substantially bi-lateral directions to thereby produce television image signals, and means for directing a predetermined and adjustable amount of light from the fluorescent light source to pass through an aperture in said housing and fall on the photo-sensitive coating on the inside wall of the tube to thereby compensate for the undesirable cyclic variation in the strength of the produced image signals due to the inherent intermittent production of light by the alternating current energized fluorescent light source.

3. A television transmitting system as claimed in claim 1 including in addition manually controlled means to vary the intensity of the light from the fluorescent source that is directed upon the photo-sensitive coating on the inside surface of the tube.

4. A television transmitting system including a television pick-up tube and a source of fluorescent light energized from an alternating current source for illuminating the subject to be televized, an opaque housing surrounding said pick-up tube, said pick-up tube including a light sensitive mosaic electrode and a light sensitive coating on a portion of the inside wall of the tube, means for projecting an optical image of the subject to be televized upon the mosaic electrode, means to scan the mosaic electrode by a cathode ray beam to thereby produce television image signals, means to project a predetermined amount of light of constant intensity upon the light sensitive coating on the inside wall of the tube, and means for directing a predetermined and adjustable amount of light from the fluorescent light source upon the light sensitive coating on the inside wall of the tube to thereby compensate for the undesired cyclic variation in the intensity of the produced image signals as a result of the use of the alternating current energized fluorescent light source.

5. A television transmitting system as claimed in claim 4 including in addition manually controlled means to adjust the intensity of the light that is directed upon the light sensitive coating on the inside wall of the tube from the fluorescent source.

6. A television transmitting system including a television pick-up tube of the electron storage type and a source of fluorescent light energized from an alternating current source for illuminat-

ing the subject to be televized, an opaque housing surrounding said pick-up tube, said pick-up tube including a light sensitive mosaic electrode and a light sensitive coating on a portion of the inside wall of the tube adjacent the light sensitive mosaic electrode, means for projecting a focused optical image of the subject to be televized upon the mosaic electrode to produce an electrostatic charge image thereon representative of the optical image, means to scan the mosaic electrode by a cathode ray beam to thereby produce television image signals representative of the charge image, means to project a predetermined amount of light of constant intensity upon the light sensitive coating on the inside wall of the tube, and a light aperture in said housing for permitting a predetermined amount of light from the fluorescent light source to fall upon the light sensitive coating on the inside wall of the tube, the predetermined amount of light being unaffected by the subject to be televised, to thereby compensate for the undesired cyclic variation in the intensity of the produced image signals as a result of the use of the alternating current energized fluorescent light sources.

7. A television transmitting system as claimed in claim 6 including in addition means to regulate the intensity of the constant intensity light that is projected upon the light sensitive coating on the inside wall of the tube.

8. A television transmitting system including a television pick-up tube of the electron storage type and a source of fluorescent light energized from an alternating current source for illuminating the subject to be televized, an opaque housing surrounding said pick-up tube, said pick-up tube including a light sensitive mosiac electrode and a light sensitive coating on that portion of the inside wall of the tube adjacent the light sensitive mosaic electrode, means including an optical system for projecting a focused optical image of the subject to be televized upon the mosaic electrode to produce an electrostatic charge image thereon representative of the optical image, means to scan the mosaic electrode by a cathode ray beam to thereby produce television image signals representative of the charge image, the produced image signals varying cyclically in intensity with inherent light intensity variations due to the use of an alternating current energized fluorescent light source, means to project a predetermined amount of light of constant intensity upon the light sensitive coating on the inside wall of the tube, and a light aperture in said housing for permitting a predetermined adjustable amount of light from the fluorescent light source, independent of the optical image intensity, to fall upon the light sensitive coating on the inside wall of the tube to thereby compensate for the undesired cyclic variations in the produced image signals.

9. A television transmitting system including a television pick-up tube and a source of inherently intermittent lighting including a fluorescent light source energized from an alternating current source for illuminating the subject to be televized, an opaque housing surrounding said pick-up tube, said tube including a light sensitive mosaic electrode and the tube having a light sensitive coating on a portion of the inside wall of the tube, means to project an optical image of the subject to be televized upon the mosaic electrode, means to scan the mosaic electrode by a cathode ray beam to thereby produce television image signals, means including a light aperture in said housing for directing a predetermined amount of light, independent of the optical image intensity, from the fluorescent light source upon the light sensitive coating on the inside wall of the tube, and means to project light of constant intensity upon the light sensitive coating on the inside wall of the tube, and means for controlling the intensity of the source of constant light to thereby compensate for the undesired effects introduced due to the use of fluorescent lighting.

10. A television transmitting system including a television pick-up tube of the electron storage type and a source of inherently intermittent lighting including a fluorescent light source energized from an alternating current source for illuminating the subject to be televized, an opaque housing surrounding said pick-up tube, said tube including a light sensitive mosaic electrode and the tube having a light sensitive coating on the inside wall of the tube adjacent the mosaic electrode, means to project an optical image of the subject to be televized upon the mosaic electrode, means to scan the mosaic electrode by a cathode ray beam to thereby produce television image signals, means including a light aperture, other than the optical image light path, in said housing to permit a predetermined regulatable amount of light from the fluorescent light source to fall upon the light sensitive coating on the inside wall of the tube, and means to project light of constant intensity upon the light sensitive coating on the inside wall of the tube, said means including a source of light positioned inside said housing, and means for controlling the intensity of the source of constant light whereby the undesired effect of the use of fluorescent lighting may be overcome.

11. A television transmitting system including a television pick-up tube of the electron storage type and a source of inherently intermittent lighting including a fluorescent light source energized from an alternating current source for illuminating the subject to be televized, an opaque housing surrounding said pick-up tube, said tube including a light sensitive mosaic electrode and the tube having a light sensitive coating on the inside wall of the tube adjacent the mosaic electrode, means to project an optical image of the subject to be televized upon the surface of the mosaic electrode, means to scan the mosaic electrode by a cathode ray beam to thereby produce television image signals, the intensity of the picture signals varying cyclically in accordance with the intermittent production of light from the fluorescent light source, means including an adjustable light aperture in said housing for directing a predetermined amount of light from the fluorescent light source upon the light sensitive coating on the inside wall of the tube to the exclusion of the mosaic electrode, and means to project light of constant predetermined intensity upon the light sensitive coating on the inside wall of the tube to thereby compensate for the variations in intensity of the produced image signals whereby the effect of the use of fluorescent lighting may be overcome.

12. In a television transmitting system wherein a television image transmitting tube of the electron storage type is used and which includes a light responsive mosaic electrode and a light responsive surface on an internal wall of the transmitting tube substantially adjacent the mosaic electrode and wherein an alternating current energized fluorescent light source is provided for illuminating the subject to be televized, the method

of compensating for intensity variations in the produced picture signals due to the use of the fluorescent light source which comprises the steps of projecting an optical image of the illuminated subject to be televized onto the mosaic electrode to produce thereon an electrostatic charge image, scanning the mosaic electrode with a cathode ray beam to release the electrostatic charges to a signal channel to produce therein a train of signal energy representative of the subject, projecting a predetermined amount of light of substantially constant intensity onto the light responsive surface of the internal wall of the tube, and directing a predetermined regulatable amount of light from the fluorescent light source to the light responsive surface of the internal wall of the tube to thereby produce an electron emission variation to compensate for the intensity variations in the produced train of signal energy due to illumination intensity variations of the mosaic by reflected light of the fluorescent source as modified by the light and shade values of the subject to be televized.

13. In a television transmitting system wherein a television image transmitting tube of the electron storage type is used and which includes a light responsive mosaic electrode and a light responsive surface on an internal wall of the transmitting tube substantially adjacent the mosaic electrode and wherein an alternating current energized fluorescent light source is provided for illuminating the subject to be televized, the method of compensating for intensity variations in the produced picture signals due to the use of the fluorescent light source which comprises the steps of projecting an optical image of the illuminated subject to be televized onto the mosaic electrode to produce thereon an electrostatic charge image, scanning the mosaic electrode with a cathode ray beam to release the electrostatic charges to thereby produce a series of picture signals representative of the subject to be televized, and directing a predetermined controllable amount of light from the fluorescent light source upon the light responsive surface of the internal wall of the tube to thereby produce a photo-electron emission variation to compensate for the intensity variations in the produced picture signals due to the inherent illumination intensity variation from the fluorescent source.

14. A television transmitting system such as defined in claim 9 including a mirror for directing light from the fluorescent source that passes through the light aperture upon the light sensitive surface on the inside wall of the television pick-up tube.

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