

ABSTRACTS OF RECENT U. S. PATENTS

17,876 (Reissue). **Multiple Sound Records on Single Film.** F. H. OWENS. November 18, 1930. Sound reproducing means employing a film having a multiplicity of sound records arranged side by side longitudinally of the film and a slit extending laterally of the film in a strip covering the entire width of all of the sound records on the film. The strip provides a mask for all of the sound records on the film except the sound record with which the slit is aligned. The strip may be shifted in order to render one sound channel effective to the exclusion of the other sound channels.

1,781,799. **Television System Employing Non-Visible Illumination.** JOHN L. BAIRD. Assigned to Television, Limited. November 18, 1930. A system of television wherein rays of non-visible frequencies are directed against an object and a light-sensitive device sensitive to such rays arranged adjacent the object for producing a modulated electric current. A scanning disk is disposed between the object and the light-sensitive device. A source of illumination is coupled with the light-sensitive device and acts in response to the impulses transmitted by the light-sensitive device. There is an exploring means disposed adjacent the source of illumination and forms an integral part of the scanning disk. The system provides means for seeing an object in darkness, in which case the invention comprises the combination with an object from which non-visible radiation is emitted or reflected, of a device that is sensitive to such radiation and correspondingly therewith controls an electric current, an exploring mechanism whereby said device explores the object or an image thereof, and a receiving apparatus comprising a luminous source of light controlled by the said device whereby a visible image of the object is provided.

1,781,866. **Speed Indicator and Variable Synchronizer.** R. H. BAHNEY. Assigned one-half to Hurxthal F. Frease. November 18, 1930. A scanning disk having formed therein a set of scanning apertures and a set of one or more speed and synchronizing apertures. A television tube is arranged to be traversed by the scanning apertures and a periodically illuminated and extinguished light is arranged to be traversed by the set of signaling apertures. Separate circuits are controlled by the scanning device adjacent the signaling apertures and adjacent the synchronizing apertures.

1,784,858. **Sound System Employing Film Markings for Gain Control.** EDWARD C. WENTE. Assigned to Bell Telephone Laboratories, Inc. December 16, 1930. Sound recording system in which a film record is moved with relation to a recording lamp and with respect to a series of marking lamps adapted to place predetermined marks upon the film. A pick-up device is located at a distance from the source of sound for translating the sound into variable current, operating a recording circuit. A second pick-up device is located near the source of sound

and connected with the recording circuit for varying the gain in the recording circuit and marking the film in accordance with the gain variation by energizing the marking lamps. In reproducing sound from the film, the reproducer is provided with a relay-operated potentiometer for introducing in the reproducer circuit proper amounts of gain to compensate for the losses occurring in the recording potentiometer. The relays of this potentiometer are controlled by contact devices operating through perforations in the film where the markings occur or by light-sensitive cells responsive to the variations of light beams caused by the film markings when the beams are projected through the film.

1,785,262. **Duplex Scanning Disk.** C. F. JENKINS. Assigned to Jenkins Laboratories. December 16, 1930. A spot scanning system employing a rotatable scanning disk common to both spot illumination and spot cell pick-up. Light is passed through the scanning disk, the disk having apertures in alignment with the scanning elements of the scanning disk. As the light passes through both scanning disks, the light is rendered effective upon a light-sensitive cell. Both the incident and the reflected light passes through the same scanning disk thereby improving the efficiency of illumination while keeping the moving spot centered on the light cell. In the apparatus employed by the patentee a large apertured scanning member is disposed between the light source and the object to be scanned and a small apertured scanning member is disposed between the first scanning member and the light-sensitive device.

1,786,652. **Dual Electro-Optical Scanning System for Television.** RALPH V. L. HARTLEY. Assigned to Bell Telephone Laboratories, Inc. December 30, 1930. A television system wherein an image is produced by successively scanning groups of elemental areas of a field of view, an image of which is to be reproduced. Each group comprises two separate elemental areas which are scanned simultaneously. A light-sensitive device is actuated by the dual scanning system for producing a single photoelectric current having a component corresponding to the tone values of each of the simultaneously scanned elemental areas.

1,787,824. **Tinting Picture Areas and Marking Sound Record of Motion Picture Film.** JOHN G. JONES. Assigned to Eastman Kodak Company. January 6, 1931. A motion picture film where the picture areas of the film are tinted while preserving the sound record area thereof untinted. The film is advanced over a tinting roller with a flexible stencil partially wrapped about the roller to mask the sound record area of the film. The tint is applied to the stencil as well as to the picture areas of the film but the position of the stencil between the tinting roller and the film precludes the tint from reaching the sound channel portion of the film.

1,787,825. **Motion Picture Film Marked to Designate Untinted Sound Record.** LOYD A. JONES. Assigned to Eastman Kodak Company. January 6, 1931. A photographic film which is provided with a series of motion picture exposure areas and an untinted sound record area. The photographic film is tinted over the picture areas but is untinted over the sound recording area as the tinting interferes with the sound record. The tinted film when used in a dark room illuminated with the usual orange and red light has such an appearance that it is difficult to determine the location of the untinted sound track on the film. A designating line is therefore provided adjacent that edge of the film

which bears the untinted sound record to enable the operator to immediately locate the untinted sound record on the film.

1,787,919. **Sound and Picture Recorded on Disk.** ARTHUR H. WATSON. January 6, 1931. Sound and picture impulses are recorded on the same disk record. The visual impressions are translated into a visible picture and the sound impressions are translated into sound. Synchronizing impulses are also provided on the record for producing a predetermined relationship between the picture and sound. The apparatus resembles a phonograph structure including the usual turntable for receiving a disk record. The synchronizing impulses are recorded in a peripheral groove while the sound impulses are recorded on the record concentrically within the picture impulses which are recorded between the peripheral synchronizing groove and the sound impulses adjacent the center of the record.

1,787,920. **Scanning Device for Television System.** ARTHUR H. WATSON. January 6, 1931. A scanning device for television systems where a plurality of reflecting surfaces are mounted upon a rotatable support, the surfaces representing a portion of a single sphere. The surfaces are shifted out of the sphere so that each surface is disposed at a different angle from the other surfaces. The reflecting surfaces are produced by simultaneously forming concave surfaces upon a plurality of reflecting elements, each comprising a sector of an annular portion of the spherical surface. The fundamental feature of the invention herein may be summarized as a structure comprising a scanning disk presenting a plurality of separate concave reflectors, each constituting a separate optical element which constitutes a single plate ground with uniform concave curvature throughout and sub-portions thereof moved out of their normal planes to comprise an operative scanning disk.

1,787,921. **Television Apparatus for Scanning Straight or Curved Lines.** ARTHUR H. WATSON. January 6, 1931. A scanning mechanism for a television system which is capable of producing both straight line and curved line pictures at will. The scanning mechanism may be changed in position for the transmission and reception of straight line or curved line pictures or vice versa. The scanning mechanism includes a rotatable drum carrying a plurality of focusing reflectors, where the reflectors are so arranged as to reflect and focus the concentrated light upon a screen along axes substantially radial to the axis of the drum, when the axis of the direct light beams from the light are perpendicular to the plane rotation of the drum. In the operation of this system a line described by the focused light upon the screen when the drum is rotated is substantially straight. The angular position of the rotatable member may be changed in modifying the system for scanning straight or curved lines at will.

1,788,010. **Combined Sound and Color Motion Picture Record.** FRED M. BISHOP. Assigned to Eastman Kodak Company. January 6, 1931. A film strip for the simultaneous reproduction of color motion pictures accompanied by sound where the film comprises a transparent support having upon one surface a photographic layer and having upon the other surface a smooth longitudinally extending area and a longitudinally extending lenticulated area, the lenticulations consisting of convex protuberances having a focal length of the same order of magnitude as the thickness of the film, the portion of the film opposite the smooth area constituting a sound record area and that opposite the lenticulated area con-

stituting a natural color motion picture record area. The protuberances or ridges are preferably of the order of twenty-two per lineal millimeter, but the exact size is dependent in part on the curvature of the protuberances, the thickness of the film and other constants of the optical system of which the film is a part, and the size may vary widely from that mentioned, say, between ten and forty per lineal millimeter; but in all events it is so minute that the focal length of an individual lens approximates, or is of the same order of size as, the thickness of the film. The patentee uses the word "lenticulated" to define such a surface comprising a large number of lens-like elements.

1,790,038. **Automatic Synchronism of Television Apparatus.** PHILIP CHALFIN AND BENJAMIN CHALFIN. January 27, 1931. A method of automatically synchronizing the moving parts of a television receiving apparatus with the moving parts of a television transmitting apparatus. The object is divided into a succession of points of light by means of oscillating elements and directed into a photoelectric cell to cause electric impulses to flow therefrom which vary in intensity in proportion to the lights and shadows of the subject. A synchronizing impulse flows from the photoelectric cell for each oscillation of each oscillating element; the images are transmitted and received and the energy amplified. A beam of light whose intensity is governed by the impulses received is directed into oscillating lenses whose oscillations are controlled by the synchronizing impulses. The light from the lenses is directed upon a screen where the likeness of the object at the transmitter is reassembled due to the oscillations of the lenses. The lenses are mounted in lens holders which oscillate under electromagnetic control for producing the required scanning of the object at the transmitter and the required sweeping of the light beam at the receiver. Synchronizing impulses control the movement of the lens holders thereby insuring synchronized movement of the scanning mechanism at both the transmitter and the receiver.

1,790,736. **Television Transmission Apparatus.** GEORGE WALD. February 3, 1931. A light-sensitive frame is provided that will convert images into amplified electric current impulses that may be transmitted to a receiver for reproduction, by direct reflection of the image on the frame which is equipped with light-sensitive cells, whereby the electric current impulses are controlled by the variation in resistance resulting from the varying degrees of light reflected from the image. The frame at the transmitter is composed of a series of conductors adapted to receive electrical impulses of varying frequency with a plurality of light-sensitive cells connected with the conductors. A second series of conductors is adapted to be excited by impulses of varying frequency. Grid rods are positioned intermediate to the respective light-sensitive cells and the second series of conductors. The circuits including both sets of conductors are brought into resonance for the transmission and reception of television energy.

1,790,898. **Electron Discharge Tube for Transmitting Pictures.** THEODORE W. CASE. Assigned to Case Research Laboratory, Inc. February 3, 1931. An electron discharge tube having a screen directly on the end thereof upon which the picture to be transmitted is focused. The portion of the electron discharge upon which the picture is focused is provided with a photoelectric coating over which the electron stream is adapted to sweep. The electron stream is directed upon the photoelectric coating and is oriented thereover by electro-static elec-

trodes angularly disposed around the path of the electron stream. The electron stream forms a moving pointer which explores every portion of the picture focused on the photoelectric material. The electrons constitute the return electrical connection between the filament and the photoelectric material. The units of this exploring electron finger alternately are rushing toward first an illuminated portion of the photoelectric material, and next toward an unilluminated portion of the photoelectric material. As a result different electrical phenomena will obtain in the completed circuit, due to the negative electrons approaching different potential points on the illuminated photoelectric electrode, and minute electric currents will flow in the complete circuit controlled by the illuminated potassium electrode.

1,791,039. **Film with Multiple Sound Records and Slit Carrier.** FREEMAN H. OWENS. Assigned to Owens Development Corporation. February 3, 1931. Sound reproducing apparatus in which a film having a plurality of sound records carried thereby is employed where the film is movable adjacent a movable slit carrier. The slit carrier is adapted to register a slit thereon with any one of the channels on the film. The slit carrier is automatically actuated to register a selected slit with a selected channel as the film is moved first in one direction and then in the reverse direction in order to provide for continuous sound reproduction.

1,792,259. **Multiple Transmission of Pictures.** WILLIAM A. TOLSON. Assigned to General Electric Company. February 10, 1931. Picture transmission system where a plurality of scanning devices are each arranged for transmitting a different picture with means for similarly framing the pictures. Scanning disks are aligned with optical systems and with separate photoelectric cells for optically scanning different pictures. The several photoelectric cells are connected in parallel and connected to control the modulation of the transmitter. The relationship of the scanning means for each of the different pictures is adjusted by individual control of each of the scanning disks.

1,792,323. **Pick-up Device for Sound Recording.** LEWIS ROBINSON. Assigned to General Electric Company. February 10, 1931. A sound pick-up for talking motion picture recording systems where a mirror is attached to a torsion member. A connection is made between a diaphragm and the torsion member at a point adapted to cause torsional vibration in the torsion member. The torsion member is centered to prevent bodily displacement thereof without restricting the torsional vibration thereof. A high degree of sensitivity is obtained by use of the torsional member in the pick-up device.

1,780,364. **Modified Braun Tube for Electrooptical Transmission.** F. W. REYNOLDS. Assigned to American Telephone and Telegraph Company. November 4, 1930. A Braun tube modified in two principal respects is used at the transmitter for scanning. One modification consists in substituting an auxiliary electrode of thin transparent film platinum or other suitable material for the usual fluorescent screen, thus forming an electrically conducting and light transmitting electrode. A second modification consists in positioning immediately in front of the auxiliary electrode, a specially constructed multiple unit photoelectric element, whose function is to control the density or power of the cathode rays or beam within the tube. A separate stream of photo-electrons is produced for each elementary area of the image. Each stream is confined to a definite path and varies in intensity to the corresponding area of the image.

1,780,572. **Optical Device for Radio Cinematographic Transmitters and Receivers.** LEON THURM. November 4, 1930. A rotatable shutter for controlling the passage of light with respect to a film where the shutter has a series of openings formed therein displaced in position with the rotation of the shutter. A screen is disposed between the shutter and the film and carries a rectangular aperture of a length equal to the double of the corresponding dimension of the aperture in the shutter. At the rear of the film there is placed a photoelectric cell or group of cells which serve to modulate a transmitter under control of the light which is passed through the film.

1,780,681. **Guide Cylinders for Motion Picture Film.** E. W. KELLOGG. Assigned to General Electric Company. November 4, 1930. A freely rotatable cylinder is provided to support the film at the recording or reproducing point. The rotatable cylinder is in turn supported by rotatable members engaging the periphery thereof. These rotatable members have fixed centers so that the rotatable cylinder revolves around the supporting rollers and forms a guiding surface for the film at the recording or reproducing point.

1,781,210. **System for Transmitting Oblong Pictures.** J. L. BAIRD. Assigned to Television, Limited. November 11, 1930. Pictures which are oblong in form may be transmitted and reproduced with either the longer side of the oblong horizontal or vertical. An exploring device is disposed adjacent an opaque screen. The screen is provided with oblong frames at spaced intervals thereon, one of which extends with its longer side in a horizontal direction and the other of which extends with its longer side in a vertical direction. The light-sensitive cell may be operatively related to either of the apertures in the screen for permitting reproduction of the image in a picture having a long side thereof extending in either direction.

1,781,550. **Multiple Sound Records of Restricted Frequency Range.** B. KWARTIN. November 11, 1930. A sound film having a multiplicity of separate sound channels in which music of different frequency characteristics is independently recorded. The separate sound channels having different frequency characteristics may operate loud speakers, each designed for the efficient reproduction of sound over a certain range of frequencies. Each sound channel is selective to different pitch frequency characteristics of particular musical instruments. This eliminates the necessity of attempting to record all frequencies in the same sound channel on the film.

1,781,800. **Light Concentration in Television System.** J. L. BAIRD. Assigned to Television, Limited. November 18, 1930. Light is concentrated upon light-sensitive cells by reflecting surfaces which extend on each side of the path of light from the object to the cells. The reflecting surfaces are disposed adjacent the path of light from the object to the cells and serve to concentrate the light upon the light-sensitive cells, which light might otherwise be scattered laterally from the object.

1,783,031. **Transmission of Pictures.** E. F. W. ALEXANDERSON AND RAY D. KELL. Assigned to General Electric Company. November 25, 1930. A Kerr cell is employed having polarized groups of transparent plates mounted on opposite sides of the cell, the planes of polarization of the two groups being arranged at right angles to each other. A lens scanning disk is located to project light through the plates of the cell. A perforated scanning disk is arranged to receive the light

through the cell and the plates therein for the transmission or reproduction of pictures of comparatively large size.

1,785,070. **Inductive Light Source.** THEODORE W. CASE. Assigned to Case Research Laboratory, Inc. December 16, 1930. A concentrated light source wherein an inductance is mounted within an evacuated bulb and high-frequency currents sustained in the inductance and modulated according to sound wave vibrations for producing changes in light intensity emitted by the inductance within the bulb. A vacuum tube oscillator is employed for impressing energy upon the inductance in the bulb. The bulb is filled with an inert gas such as helium, argon, neon, nitrogen, *etc.*

1,786,812. **Facsimile Transmission System.** V. K. ZWORYKIN. Assigned to Westinghouse Electric & Manufacturing Company. December 30, 1930. A motion picture film is moved past a transmitter at a fixed speed between an oscillating mirror and a photoelectric cell. Light from a fixed source is directed against the mirror and, after reflection therefrom, is focused to a fine point that moves from side to side of the moving film. Assuming that the film is moving vertically, the vertical component of the scanning motion is accordingly provided for by the motion of the film, while the horizontal component is taken care of by the mirror-oscillations.

At the receiving station a Braun tube having a plurality of cathode-ray controlling devices mounted therein is provided. One of the controlling devices functions in accordance with the output from the photoelectric cell at the sending station and serves to impose variations upon the amplitude of the ray; another of the controlling devices causes the ray to move horizontally in synchronism with the oscillating mirror at the sending station; while still another controlling device periodically deflects the ray vertically at a speed equal to the linear advance of the film at the sending station.

1,788,227. **System for Uniform Detail in Scanning.** J. O. BENTLEY. Assigned to General Electric Company. January 6, 1931. Scanning mechanism for picture transmission where the scanning disk is provided with laterally extending lines which move past a slot forming a light aperture for scanning the picture radially so that the details of the reproduced picture vary in fineness from the center to the perimeter. The ends of the slotted aperture are wider than the intermediate portion of the aperture and as the radially slotted disk rotates the size of the scanning beam increases near the ends of the radial slots in the disk, thereby enabling the detailed reproduction of the picture to be as accurate at the periphery as it is at the center.

1,790,491. **Television Scanning System.** T. A. SMITH. Assigned to Radio Corporation of America. January 27, 1931. A mirror disk having two portions, one of the portions being associated with a reflector system for scanning and reproducing a television subject along a parallel set of lines extending in one direction across the subject. A second reflector system cooperates with the second portion of the mirror disk for scanning and reproducing the same subject along a second set of parallel lines extending in an angular direction to the first-named set of scanning and reproducing lines. At each half revolution of the mirror disk, the scanning is cyclically changed from one to the other of the sets of scanning and reproducing lines at a rate commensurate with the persistency of vision.

1,790,687. **Combined Phonograph and Motion Picture Projectors.** S. S. A.

WATKINS. Assigned to Electrical Research Products, Inc. February 3, 1931. A home type talking motion picture machine in which a phonograph record may be driven by the usual phonograph motor or may be driven by a belt connection with a motion picture projecting machine for synchronizing the operation of the motion picture projector with the phonograph sound reproducer. The record table for the phonograph is provided with a pulley around which a belt moves for imparting motion to the phonograph turntable in synchronism with the movement of the motion picture projector. The auxiliary disk which forms the turntable and which carries the pulley may be removed and the usual record table for the phonograph used independently of the motion picture projector.

1,791,481. **Television Scanning Device.** O. TERVO. February 3, 1931. A construction of scanning apparatus which eliminates the usual scanning disk. Two mirror polyhedrons are rotated in timed relationship in right angle planes. One mirror is not more than $\frac{1}{4}$ inch in width. A lens serves to focus a point of light on the peripheral edge of the mirror. An optical system is associated with the mirrors for effecting a scanning operation without the use of a scanning disk.