LB-955

Licensee Patent Bulletin

SERIES 54-2

RADIO CORPORATION OF AMERICA
RCA LABORATORIES DIVISION
INDUSTRY SERVICE LABORATORY

RADIO CORPORATION OF AMERICA

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LB-955

Licensee Patent Bulletin

Series 54-2

April 1, 1954 to June 30, 1954

Approved

Stuart W. Seeley.

Index

Note

THIS bulletin contains a list of recently issued patents and patents under which rights have recently been acquired, in respect of which Licensees of Radio Corporation of America are licensed pursuant to the terms of their respective license agreements with Radio Corporation of America and of the agreements with others whereby Radio Corporation of America has acquired such rights.

With respect to the listed patents of Raytheon Manufacturing Company and/or its subsidiaries Belmont Radio Corporation and Submarine Signal Company, the scope of the licenses granted by RCA under such patents is set forth in revised page 3 of LB-766.

Patents up to and including No. 2,085,721 have expired on or before June 29, 1954.

DISCLAIMERS FILED IN THE UNITED STATES PATENT OFFICE

2,556,254.—*Gerald G. Carne*, Rockaway, N. J. VOLTAGE REFERENCE TUBE. Patent dated June 12, 1951. Disclaimer filed Mar. 5, 1954, by the assignee, *Radio Corporation of America*.

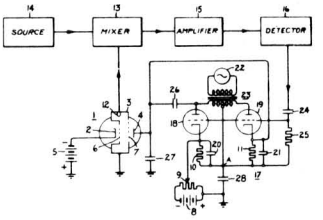
Hereby enters this disclaimer to claims 1 and 3 of said patent.

Contents

SECTION I. RADIO BROADCAST RECEIVERS

I-A. Sound Receivers (includes Phonographs)

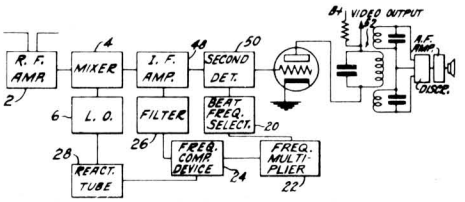
2,676,256
AUTOMATIC FREQUENCY CONTROL SYSTEM
Jack L. Schultz, Syracuse, N. Y., assignor to General Electric Company, a corporation of New York
Application March 4, 1946, Serial No. 651,944
1 Claim. (Cl. 250—27)



In a system for comparing two periodic voltages, a pair of electron discharge devices each having an anode, cathode and control electrode, a resistance-capacitance network connected between each of said cathodes and a point of reference potential, a first source of alternating reference voltage of substantially constant amplitude, means to impress voltage from said source between each of said anodes and said point in opposite phase, each of said networks having a relatively long time constant as compared to the period of said voltage, a second source of periodic voltage, means to impress voltage from said second source between each of said control electrodes and said reference point in the same phase, and an output circuit responsive to the peak voltage across said networks in series.

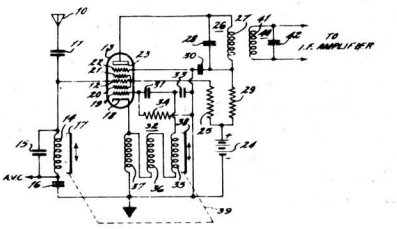
2,677,049
AUTOMATIC FREQUENCY CONTROL
Gordon F. Rogers, North Hollywood, Calif., assignor to Radio Corporation of America, a corporation of Delaware
Application July 15, 1950, Serial No. 173,981
5 Claims. (Cl. 250—20)

1. A receiver adapted to receive two carriers comprising in combination a first detector, a local oscillator connected to said first detector so as to produce a separate intermediate carrier for each of said carriers, means for deriving one of said intermediate carriers, means for deriving a beat frequency signal representing the frequency difference between said intermediate carriers, and means coupled with said carrier deriving means and said beat frequency signal deriving means for controlling the frequency of said local oscillator in response to the frequency relationship between said beat frequency signal and the frequency of said derived one of said intermediate carriers.



2,679,007
VARIABLE INDUCTANCE CIRCUITS
William F. Sands, Haddonfield, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application July 15, 1949, Serial No. 104,984
14 Claims. (Cl. 250—36)

8. In an oscillator including an electronic tube having an input circuit electrode, an output circuit electrode and a third electrode common to



both input and output circuits, a circuit coupling said input and output circuits, comprising a

multi-filar coil structure having at least three mutually closely coupled windings in which each of the turns of each winding is adjacent to corresponding turns of each of the other windings, circuit means connecting at least one of said windings to said output circuit electrode and a different number of said windings to said input circuit electrode, capacitance means coupled to said coil structure for resonating certain ones of said windings at an oscillator frequency determined by the values of said capacitance and the inductances of said respective windings, and a core element adjustably positionable within said coil structure to vary the inductances of all of said windings substantially in the same proportion, whereby to vary said oscillator frequency.

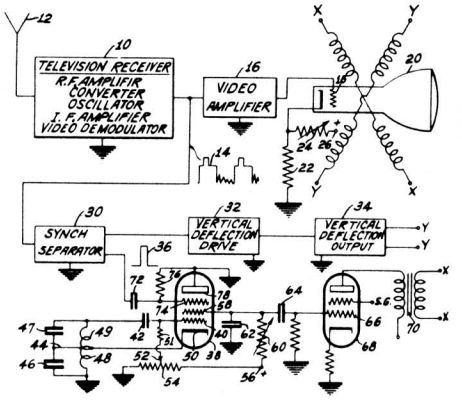
2,681,992

TIME AVERAGING DEFLECTION SIGNAL GENERATOR

William Davis Houghton, Port Jefferson, N. Y., assignor to Radio Corporation of America, a corporation of Delaware

Application March 31, 1949, Serial No. 84,643
4 Claims. (Cl. 250—36)

1. Apparatus for generating sawtooth deflection waves in synchronism with reference pulses and comprising in combination: a source of reference pulses, an oscillator including an intermittently conducting amplifier having a first and a second electrode, a first direct current path between said first and second electrodes including a load impedance and a source of potential so connected as to make said second elec-



trode positive with respect to said first electrode, means including a capacitor connected between said first and second electrodes for producing a sawtooth wave, and means connected to said source of reference pulses and coupled into said second direct current path for simultaneously increasing the flow of electrons in said second path and decreasing the flow of electrons in said first path in response to the occurrence of said reference pulses.

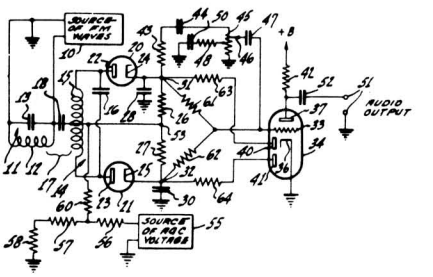
2,682,606

CENTER TUNING CIRCUIT FOR FREQUENCY MODULATION DETECTORS

Eugene O. Keizer and Marlin G. Kroger, Princeton, N. J., assignors to Radio Corporation of America, a corporation of Delaware

Application December 14, 1950, Serial No. 200,728
17 Claims. (Cl. 250—27)

1. In combination with a source of angle-modulated carrier waves, a tuned discriminator network coupled to said source for deriving from said waves a pair of carrier-wave voltages whose relative magnitudes are dependent upon the angular modulations of said waves, a pair of rectifiers, said discriminator network being connected to said rectifiers for impressing said voltages on respective ones of said rectifiers, a rectifier output circuit connected to said rectifiers and hav-

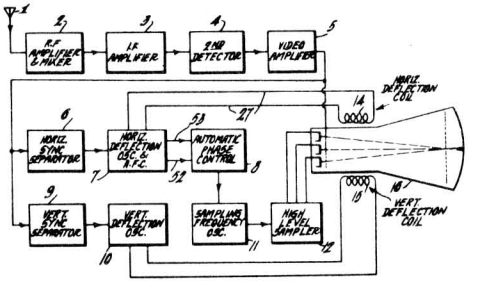


ing a first pair of potential points across which a first potential of constant positive polarity is developed from said waves and a second pair of potential points across which a second potential is developed which is zero in response to the frequency of said waves coinciding with the predetermined frequency of said discriminator network and of opposite polarity in response to the frequency of said waves being higher and respectively lower than said predetermined frequency, an amplifier having at least a cathode, an anode and a control grid, a source of direct current potential and a resistor connected serially between said cathode and said rectifier circuit, and circuit connections between said rectifier output circuit and the cathode and control grid of said amplifier for developing the modulation signal and impressing it on said amplifier, said last-named circuit connections including means for applying a control potential to said control grid which is a composite sum of the potential developed by said source of direct current potential together with a positive potential across said first pair of points and at least a portion of a negative potential difference developed across said second pair of points, thereby to render said amplifier conducting only when the center frequency of said waves coincides substantially with said predetermined frequency.

I-B. Television Receivers (includes Facsimile)

2,674,650
COLOR TELEVISION SYNCHRONIZING SYSTEM
William D. Houghton, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application January 24, 1951, Serial No. 207,509
6 Claims. (Cl. 178—5.4)

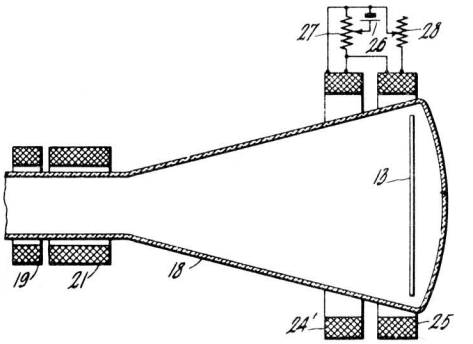
1. A pulse phase shifter comprising in combination, a first amplifier having an output electrode and a control electrode, a condenser connected to said control electrode, said condenser being adapted to be charged from a source of synchronizing pulses, a discharge path connected to said control electrode whereby said condenser may be discharged, a second amplifier connected across at least a portion of said discharge path,



said second amplifier having a control electrode adapted to be energized by a control voltage whereby the phase of the pulses passed by said third amplifier with respect to said synchronizing pulses varies in accordance with said control voltage means differentiating the output of said first amplifier to produce positive and negative pulses for each of said synchronizing pulses, a third amplifier having input and output circuits, and means connecting said differentiated output to the input circuit of said third amplifier, said third amplifier being biased to pass only said positive pulses.

2,675,501
ELECTRON BEAM FOCUSING SYSTEM
Albert W. Friend, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application October 31, 1950, Serial No. 193,205
5 Claims. (Cl. 315—27)

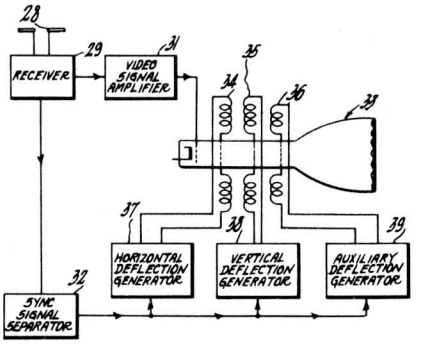
1. A system for controlling an electron beam which is directed toward a target electrode comprising, means located along the path of the beam at a point remote from said target electrode for producing a substantially constant field by which to focus said beam at a predetermined point in the plane of said target electrode, means located along the path of said beam at a point less remote from said target electrode for producing a



varying field by which to deflect the beam to scan a raster in the plane of said target electrode, and means including a plurality of coils located along the path of the beam in proximity to said target electrode for producing respective component fields jointly constituting a substantially constant field by which to effect focusing of said beam at all points of the raster scanned in the plane of the target electrode, said two constant fields being effectively independent of one another.

2,676,200
TELEVISION SCANNING SYSTEM
George C. Sziklai, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application November 9, 1950, Serial No. 194,795
10 Claims. (Cl. 178—5.4)

1. A system for scanning a television raster comprising, means including a horizontal deflection system for effecting a horizontal scanning of said raster, means including a vertical deflection system for effecting a vertical scanning of said raster, said raster having an odd number of substantially horizontal lines appearing in a plurality of line-interlaced fields, means including an auxiliary vertical deflection system for effecting an undulating horizontal scanning of said raster, and means controlling said aux-



iliary deflection system to effect a 180° phase shift between successive scansions of the same line in different ones of said fields.

2,677,721

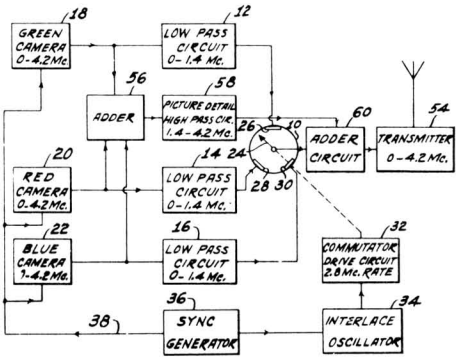
COLOR TELEVISION SYSTEM

Alda V. Bedford, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application September 24, 1949, Serial No. 117,618

19 Claims. (Cl. 178—5.2)

1. In a television receiver the combination of, a source of intelligence signal divisible into high and low frequency components, a signal channel adapted to pass predetermined low frequency signal components and attenuate predetermined high frequency signal components, means for coupling intelligence signal to the input of said signal channel, means connected with said coupling means for periodically interrupting the application of intelligence signal to said signal channel at a predetermined rate, means connected with said intelligence signal source for extracting high frequency components therefrom, a signal adding means, and connections applying both the output of said signal channel and said high frequency signal extracting means to the input of said adding means for combining in the output thereof.



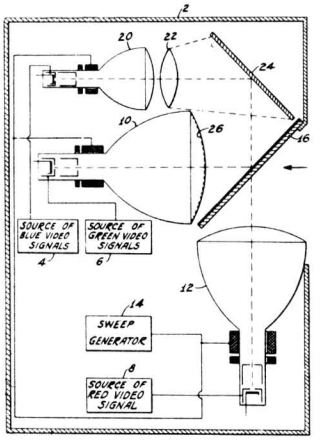
2,677,722

COLOR TELEVISION IMAGE REPRODUCER

Alda V. Bedford, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application December 31, 1949, Serial No. 136,252

14 Claims. (Cl. 178—5.4)



1. An apparatus for reproducing colored images comprising in combination a first cathode ray tube adapted to reproduce images that are representative of at least one component color on a first fluorescent screen, a second cathode ray tube adapted to reproduce images that are representative of a different component color on a second fluorescent screen, and optical means for projecting the images formed on said second fluorescent screen onto said first fluorescent screen in image registry.

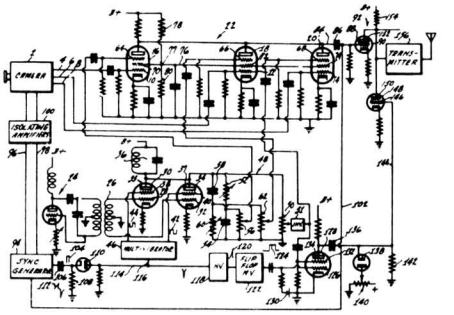
2,678,348

COLOR TELEVISION INTERLACING SYSTEM

Randall C. Ballard, Trenton, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application September 24, 1949, Serial No. 117,528

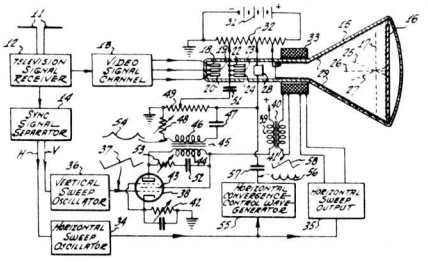
20 Claims. (Cl. 178—5.2)



1. In a color television system a transmitter comprising a generating means for deriving video signals corresponding to a first component color as the lines of a raster are being scanned, generating means for deriving signals corresponding to at least one other component color as the lines of a raster are being scanned, an output circuit, means for repeatedly applying

the signals derived from said generating means in succession and at a frequency that is greater than the line scanning frequency to said output circuit with a predetermined phase with respect to a line scanning interval, and means for changing the phase with which the generated signals are applied to said output circuit during another line scanning interval.

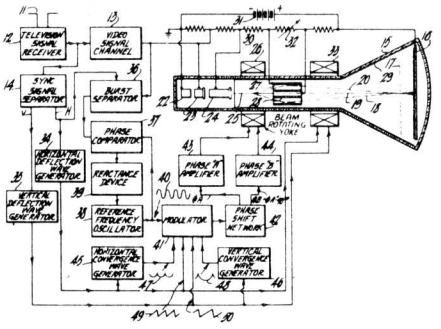
2,678,405
MULTIBEAM CONVERGENCE CONTROLLING SYSTEM
Hunter C. Goodrich, Collingswood, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application July 23, 1952, Serial No. 300,423
10 Claims. (Cl. 315—13)



1. In a cathode ray image-reproducing system wherein a plurality of electron beam components, which traverse predeflection paths that are spaced respectively about the longitudinal axis of a tube, are angularly deflected both horizontally and vertically to scan a raster in a predetermined plane and having field-producing means adjacent to said predeflection paths and energizable to effect substantial convergence of said beam components at all points of said raster, a system to energize said field-producing means comprising, a raster-scanning substantially sawtooth deflection wave generator comprising an output circuit including an electron tube having an anode coupled to said deflection wave output circuit, a convergence wave output transformer having primary and secondary windings, a predominantly resistive convergence wave output circuit coupling said secondary winding to said field-producing means, means coupling said primary winding to said electron tube anode, and an integrating capacitor connected to said primary winding to convert some of the energy of said sawtooth wave to a substantially parabolic wave in said secondary winding.

2,679,614
BEAM-CONTROLLING SYSTEM FOR TRICOLOR KINESCOPES
Albert W. Friend, Bala-Cynwyd, Pa., assignor to Radio Corporation of America, a corporation of Delaware
Application September 17, 1952, Serial No. 310,043
18 Claims. (Cl. 315—13)

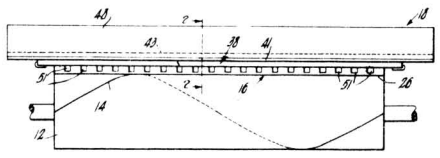
1. In a color television image-reproducing system including a cathode ray tube having a luminescent screen of a type producing light of the component colors of an image when impinged by electron beam components approaching it from



different angles and deflected to scan a raster at said screen, apparatus for controlling the convergence of said beam components in a plane in the vicinity of said screen, said apparatus comprising, means producing a plurality of electron beam components traversing pre-deflection paths that are spaced respectively about the longitudinal axis of the tube, means including a pair of coaxial cylindrical field-producing electrodes to effect said beam convergence, said cylindrical electrodes being positioned relative to said longitudinal tube axis in such a manner that said beam components traverse the space between said electrodes, and means energizing one of said two first-mentioned means as a function of said beam deflection to vary said beam convergence angle in a manner to maintain beam convergence in said plane at all points of the scanned raster.

2,680,056
FLEXIBLE PRINTER BAR FOR ELECTRICAL RECORDERS
Roger G. Olden, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application June 20, 1950, Serial No. 169,103
6 Claims. (Cl. 346—139)

1. In combination in facsimile apparatus, a rotary drum having a helical member supported thereon, an elongated printer bar arranged to be positioned in cooperative relationship to the drum and helical member so as continuously to bring the bar and the helix to bear upon each other, a recessed support element for said printer

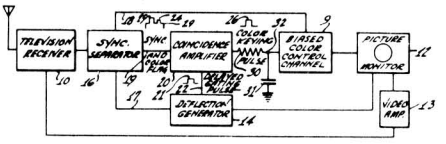


bar, resilient means spanning the recess in the support element, said printer bar being of "T" shape and comprising a flat flange and a strip, the free edge of said strip providing a printing electrode, means for securing said flange to said resilient means, and spaced slots extending from the edge of said flange and continuing a substantial distance into said strip, the drum and the printer bar being adapted to receive a record receiving strip between them.

2,681,379
SIGNAL OPERATED AUTOMATIC COLOR CONTROL CIRCUITS

Alfred C. Schroeder, Feasterville, Pa., and Dalton H. Pritchard, Princeton, N. J., assignors to Radio Corporation of America, a corporation of Delaware

Application April 27, 1951, Serial No. 223,258
14 Claims. (Cl. 178—5.4)



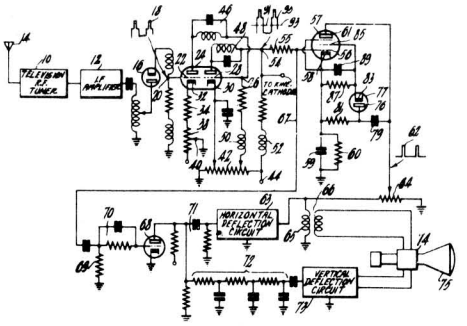
1. In a television system having deflection circuits adapted for operation to provide either color or black and white pictures corresponding to separate incoming signals, the color signals having an identifying waveform separable from the picture intelligence and normal synchronizing signals, an automatic color control circuit comprising, a circuit for separating said identifying waveform from incoming color signals, a picture reproducing device normally operable for reproducing black and white pictures, a color control circuit for operation with said reproducing device to provide color pictures rather than black and white, a circuit for providing a bias potential for said color control circuit to prevent operation thereof in the absence of signals overcoming the bias, means to provide a potential for overcoming said bias including a coincidence amplifier, means connected for providing one input pulse to said amplifier comprising said identifying waveform after separation and means connected for providing another input pulse to said amplifier comprising gating signals derived from said synchronizing signals so that said amplifier provides said potential for overcoming the bias only upon coincident arrival thereat of said identifying waveform and said gating signals, whereby the color control circuit coincidence amplifier automatically switches said receiver circuit for either black and white or color picture operation.

2,681,948
NOISE LIMITER FOR TELEVISION RECEIVERS

Jack Avins, Staten Island, N. Y., assignor to Radio Corporation of America, a corporation of Delaware

Application August 24, 1951, Serial No. 243,453
3 Claims. (Cl. 178—7.3)

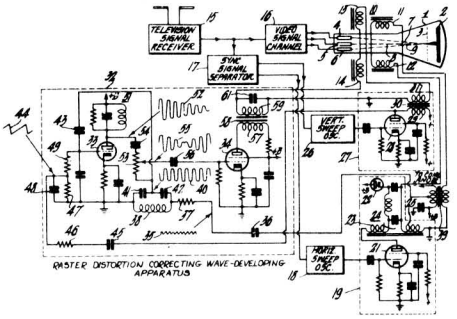
3. In a television receiver adapted to receive television signals having a recurrent synchronizing pulse component and comprising a video amplifier having an output terminal, a keyed noise clipper comprising: an electron tube having an anode, a cathode, a control electrode and a screen grid, means connected with said electron tube for rendering said tube normally non-conducting, a point of reference potential, a capacitor connected between the cathode of said electron tube and said point of reference potential, a resistor connected in shunt with said capacitor, means connecting the output terminal of said video amplifier to the control electrode of said electron tube, a source of keying pulses synchronous with the recurrent pulse component of the television signals, means connecting the anode of said electron tube to said source of keying pulses so as to render said normally non-conducting electron tube conducting during said keying pulses, a unilateral conduction device having an anode and a cathode, a capacitor connected between said source of keying pulses and the anode of said unilateral conduction device, a connection between the screen grid of said electron tube and the cathode of said unilateral conduction device, a first resistor connected between the anode of said unilateral conduction device and the cathode of said electron tube, a second resistor connected between the cathode of said unilateral conduction device and the cathode of said electron tube, and a capacitor connected in shunt with said second resistor.



2,682,012
TELEVISION RASTER DISTORTION CORRECTION

Robert K. Lockhart, Moorestown, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application September 8, 1952, Serial No. 308,357
9 Claims. (Cl. 315—24)

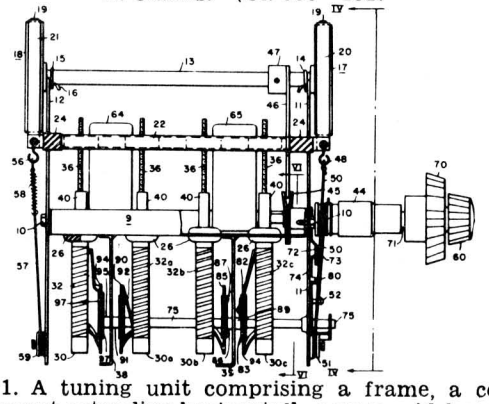


1. In a system for energizing deflection apparatus of a cathode ray tube to deflect an electron beam suitably to scan a raster of substantially rectangular shape at a target electrode of said tube by means of horizontal and vertical sawtooth deflection wave generators coupled respectively to horizontal and vertical beam-deflecting field-producing components, raster distortion correcting wave-developing apparatus comprising, two input circuits and an output circuit, said output circuit being coupled to said vertical beam-deflecting field-producing component, means coupling said input circuits respectively to said horizontal and vertical deflection wave generators, first wave-shaping means in said horizontal in-

put circuit to produce a horizontal frequency wave, second wave-shaping means in said vertical input circuit to produce a vertical frequency wave, a modulator having an input circuit coupled to both of said wave-shaping means and also having an output circuit in which is developed a horizontal frequency wave completely modulated with said vertical frequency wave, and means adding in phase opposition said modulated and unmodulated horizontal frequency waves to develop in said wave-developing apparatus output circuit a correcting wave at horizontal deflection frequency varying in amplitude at vertical deflection frequency from a maximum to a minimum in a first interval and from a minimum to a maximum in a succeeding second interval, said correcting wave having opposite phases in said two intervals.

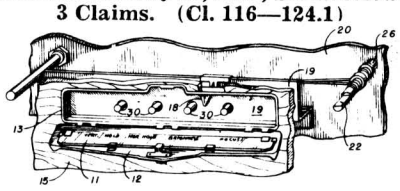
I-C. Converters, Tuners & Tuning Indicators

2,677,112
INDUCTANCE TUNING MECHANISM
James E. Krepps, Bloomington, Ind., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application January 13, 1951, Serial No. 205,895
14 Claims. (Cl. 336—131)



1. A tuning unit comprising a frame, a coil support extending horizontally across said frame, a first plurality of spaced, aligned tubes extending from said support along one side thereof, a second plurality of spaced, aligned tubes extending from said support along the other side thereof, said first and second tubes having parallel axes, a first plurality of coils on said first tubes, a second plurality of coils on said second tubes, a first plurality of tuning cores aligned centrally with said first tubes, a second plurality of tuning cores aligned centrally with said second tubes, a first core supporting means attached to said first cores and extending perpendicular to the axis of said tubes, a second core supporting means attached to said second cores and extending perpendicular to the axes of said tubes, and means for moving said first core supporting means towards said first tubes and for simultaneously moving said second core supporting means away from said second tubes.

2,677,346
TELEVISION RECEIVER TUNING INDICATOR
William H. Myers, Cincinnati, Ohio, and Carl Reynolds, Jr., Birmingham, Mich., assignors to Avco Manufacturing Corporation, Cincinnati, Ohio, a corporation of Delaware
Application February 19, 1952, Serial No. 272,474
3 Claims. (Cl. 116—124.1)

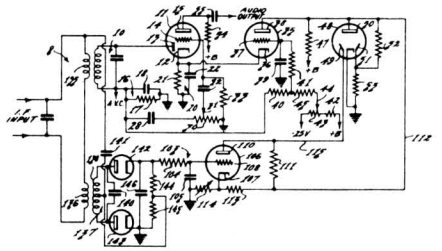


1. In combination, a television receiver chassis a slide rule type of dial structure comprising an indicia plate having a transparent portion and an opaque portion, a bezel formed to support said plate, a frame structure formed to hingedly support said bezel for opening and closing movements about an axis fixed with relation to said television chassis, a movable pointer disposed between said chassis and the transparent portion of said plate in indicating relationship with indicia on the opaque portion of said indicia plate, manual receiver circuit adjustment means disposed immediately behind the space covered by the opaque portion of said indicia plate when said plate is in closed position whereby said adjustment means is inaccessible and hidden from view when said bezel is in closed position and whereby said adjustment means is in view and accessible when said bezel is in open position.

SECTION II. COMMERCIAL RADIO APPARATUS

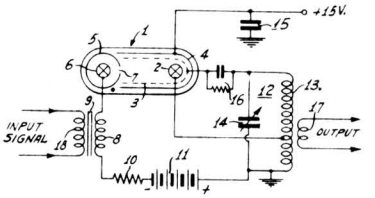
II-A. Sound Transmitters & Receivers

2,675,468
INTERCHANNEL NOISE SUPPRESSOR CIRCUITS
Benjamin S. Vilkomerson, Camden, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Original application November 24, 1948, Serial No. 61,864, now Patent No. 2,630,527, dated March 3, 1953. Divided and this application August 6, 1952, Serial No. 302,898
2 Claims. (Cl. 250—20)



1. A modulated carrier wave receiver comprising a carrier wave transmission channel, a detector coupled to said channel and having a cathode and an anode, a load circuit coupled between said cathode and anode to develop the modulation signal, a modulation signal amplifier having a high amplification factor and a common cathode with said detector, said modulation signal amplifier having input electrodes including said cathode, said load circuit being coupled to said input electrodes to impress said modulation signal thereon, a frequency discriminator coupled to said channel and having an output circuit for developing a signal whose mean voltage is proportional in polarity and magnitude to the sense and amount of frequency departure of the frequency of said wave from the assigned center frequency of said discriminator, a first control amplifier responsive to said mean voltage, a second control amplifier having a lower amplification factor than that of said signal amplifier, said second control amplifier having a further cathode, said cathodes being connected together, an impedance element in the common cathode circuit of said signal amplifier and said second control amplifier, means including a source of voltage for impressing a predetermined voltage on said control grid to render said second control amplifier conducting in the absence of a carrier wave and to render said signal amplifier non-conducting, a connection between said load circuit and said control grid to cut off suddenly said second control amplifier and to render said signal amplifier suddenly conducting when a carrier wave is impressed on said detector having an average amplitude exceeding a value determined by said predetermined voltage, and an electronic indicator device coupled to said first control amplifier for visually indicating the magnitude and polarity of said mean voltage.

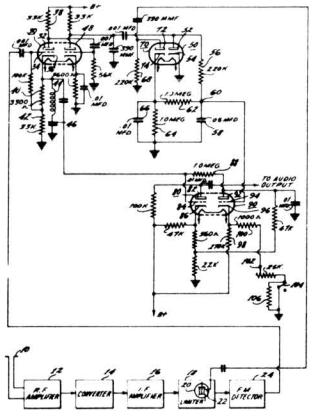
2,676,302
FREQUENCY MODULATION
William M. Webster, Jr., Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application December 14, 1950, Serial No. 200,717
7 Claims. (Cl. 332—16)



1. A frequency modulation arrangement, comprising a gaseous discharge device, means for ionizing the gas in said device, said device having a plurality of electrodes including anode and cathode electrodes and also a control electrode operating at a potential negative with respect to the potential of said gas, thereby forming a positive ion sheath about said control electrode, means for supplying said electrodes with operating potentials, a tuned circuit, means coupling said anode, cathode and control electrodes to spaced points on said circuit, thereby to develop oscillations in said device and said circuit, and means for controlling said ionizing means by a modulating signal to modulate the intensity of ionization of said gas and thereby also the thickness of said sheath and the effective capacitance provided thereby.

2,678,384
SQUELCH CONTROL CIRCUIT
Roy A. Beers, Jr., Audubon, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application March 30, 1951, Serial No. 218,345
7 Claims. (Cl. 250—20)

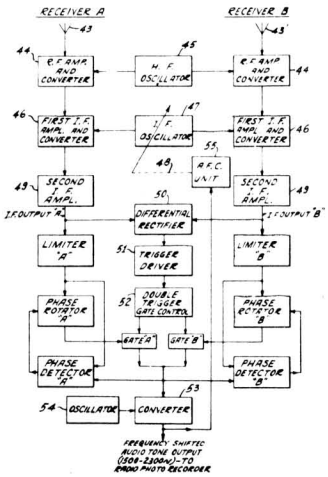
1. A control frequency operated squelch control system comprising a first electron discharge tube having anode, cathode and control grid electrodes, means to apply a signal to said first tube grid, an anode load resistor connected to said first tube anode, a cathode load resistor connected to said first tube cathode, means to present substantially a short-circuit to said cathode load resistor at said control frequency and to present at other frequencies a high impedance to said cathode load resistor when compared with its resistance value, a second electron discharge tube having anode, cathode and grid electrodes, said first tube cathode being coupled to said second tube grid, means to maintain said second tube non-conductive, and means to apply output from said first tube anode load resistor to said last named means to render said last named means



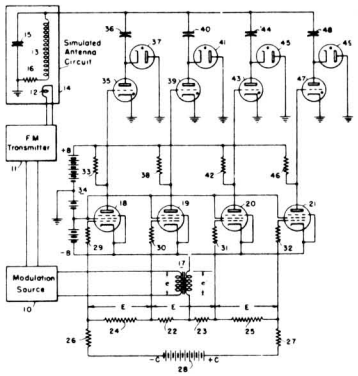
inoperative when said control frequency is present in said signal applied to said first tube grid to permit said second tube to amplify said signal.

2,678,385
DIVERSITY RECEIVER
John B. Atwood, Riverhead, N. Y., assignor to Radio Corporation of America, a corporation of Delaware
Application April 16, 1951, Serial No. 221,184
4 Claims. (Cl. 250—20)

1. In a diversity receiver, a pair of separate receiving channels in which appear two different versions of a signal being received by said receiver, separate couplings from each signal channel to a gate device which is controllable to pass one or the other of the signal versions to a common output circuit, means for comparing the strengths of the two signal versions and for controlling said gate device to pass the stronger signal version to said output circuit, a phase rotator in at least one of said couplings, said phase rotator comprising means for splitting the corresponding signal version into four quadrantally-related voltages, four electron discharge device structures each having first and second input electrodes and an output electrode, means for respectively applying said four voltages to different ones of said first input electrodes of said discharge device structures, and means for connecting the output electrodes of all said discharge device structures in parallel to a common output circuit coupled to said gate device, at least one phase detector for comparing the signal version passed by said gate device and the signal version corresponding to said phase rotator and for producing four control voltages the relative amplitudes of which are dependent upon the phase relation of the two signals being compared, and means for respectively applying said four control voltages to different ones of said second input electrodes of said discharge device structures, to control conduction in the respective discharge device structures.

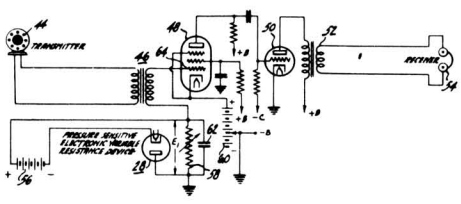


2,679,581
ANTENNA TUNING SYSTEM
Mark I. Jacob, Baltimore, and Robert J. Howell, Catonsville, Md., assignors to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application May 20, 1950, Serial No. 163,128
5 Claims. (Cl. 250—17)



1. Frequency modulation apparatus comprising a frequency modulation transmitter, an antenna circuit for said transmitter, said circuit including an inductor, a capacitor for lowering the resonant frequency of said circuit when connected across said inductor, an electron tube connected to said inductor and said capacitor for electrically connecting said capacitor across said inductor upon conduction of said tube, a modulation signal source for said transmitter, and means responsive to signals from said source for causing said tube to conduct when said signals cause the frequency of said transmitter to decrease.

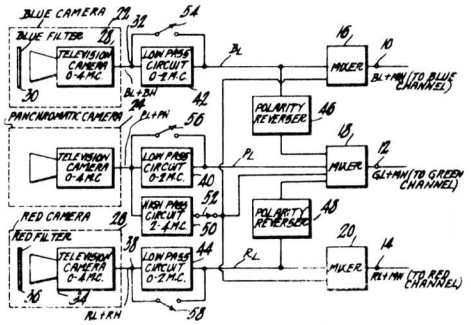
2,680,779
COMMUNICATION COMPENSATION SYSTEM FOR ATMOSPHERIC PRESSURE VARIATION
Leslie J. Anderson, Moorestown, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application May 6, 1949, Serial No. 91,703
1 Claim. (Cl. 179—1)



Apparatus to derive a control voltage dependent upon altitude comprising an enclosed chamber having a movable diaphragm as part of its wall structure, said diaphragm being exposed to and movable in response to atmospheric pressures, the remainder of said chamber walls being sufficiently rigid to withstand changes in ambient pressure, a variable resistance tube mounted inside said chamber, said variable resistance tube having a movable control electrode therein for varying the space path impedance thereof, said movable electrode extending externally of said tube and being mechanically coupled to said diaphragm to be movable in unison therewith, means including a variable resistance to derive a voltage from said variable resistance tube having an amplitude dependent upon the space path impedance thereof, an audio amplifier having amplitude control means, a source of audio signals coupled to said amplifier, an electro-acoustic transducer coupled to the output of said audio amplifier, and means to impress said voltage upon said amplitude control means whereby the amplitude of the signals heard from said electro-acoustic transducer is continuously maintained substantially constant with changes in altitude.

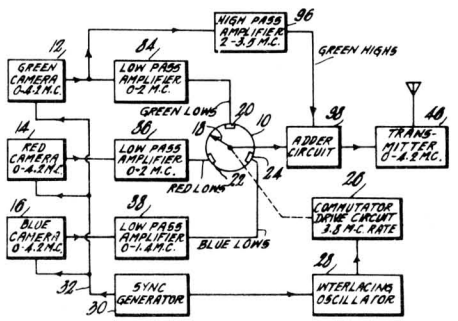
II-B. Television Transmitters (includes Facsimile)

2,675,422
ELECTRICAL SCANNING
Alda V. Bedford, Princeton, N. J., assignor to Radio Corporation of America, Princeton, N. J., a corporation of Delaware
Application April 1, 1950, Serial No. 153,473
19 Claims. (Cl. 178—5.4)



1. In a color television system, a first television camera responsive to substantially none but one primary color aspect of a television scene to produce a color signal, a second television camera responsive to substantially all color aspects of the same television scene to produce a substantially panchromatic type television signal, means including an electrical signal subtracting circuit having a signal inverter and a plurality of signal inputs for subtractively combining electrical signals and delivering a resultant to an output terminal, connections applying the color signal outputs of said television cameras to respectively different inputs of said subtracting circuit the connection from the output of one of the television cameras to the respective signal input of the subtracting circuit being made through the signal inverter, whereby to obtain at the output of said subtracting circuit a color signal representing a color complement of at least that color represented by said first color camera.

2,677,720
COLOR TELEVISION SYSTEM
Alda V. Bedford, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application September 23, 1949, Serial No. 117,368
30 Claims. (Cl. 178—5.2)

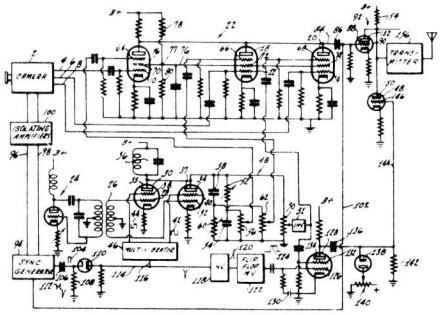


1. In a color television transmitter employing a plurality of color channels each containing a respective set of color signals divisible into high and low frequency signal components, the combination comprising, means for successively sampling during sampling intervals of a predetermined duration and occurring at a predetermined sampling rate the individual low frequency component output of each of said sets of color signals to produce a series of output pulses each pulse substantially corresponding to low frequency color information of a respective color signal, a signal adding circuit, means for applying both said series of color information pulses and the high frequency components of at least one of said color channels to said signal adding circuit for combining therein and means for applying the output of said adding circuit to the input of a color television signal transmission circuit.

2,678,348
COLOR TELEVISION INTERLACING SYSTEM

Randall C. Ballard, Trenton, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application September 24, 1949, Serial No. 117,528
20 Claims. (Cl. 178—5.2)



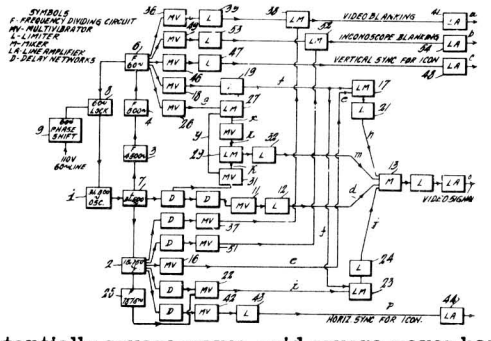
1. In a color television system a transmitter comprising a generating means for deriving video signals corresponding to a first component color as the lines of a raster are being scanned, generating means for deriving signals corresponding to at least one other component color as the lines of a raster are being scanned, an output circuit, means for repeatedly applying the signals derived from said generating means in succession and at a frequency that is greater than the line scanning frequency to said output circuit with a predetermined phase with respect to a line scanning interval, and means for changing the phase with which the generated signals are applied to said output circuit during another line scanning interval.

2,678,351
COLOR TELEVISION

Alfred C. Schroeder, Feasterville, Pa., assignor to Radio Corporation of America, a corporation of Delaware

Application September 24, 1949, Serial No. 117,593
9 Claims. (Cl. 178—69.5)

1. A synchronizing system comprising in combination a monostable multivibrator having a synchronizing input circuit and a control terminal, said monostable multivibrator having a pulse duration dependent upon the control voltage applied to said control terminal, a source of pulses of a predetermined frequency, a source of sub-



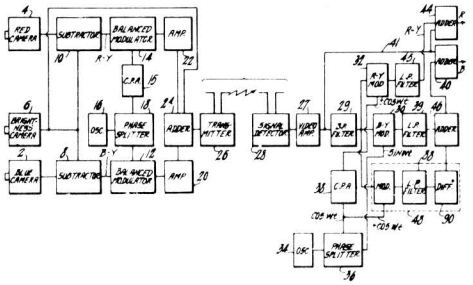
stantially square waves, said square waves having a frequency one half the frequency of the pulses of said source of pulses, means of applying said pulses to said synchronizing input circuit, and means for applying said square waves to said control terminal.

2,680,147
DISTORTION ELIMINATOR

Roland N. Rhodes, New Brunswick, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application December 31, 1952, Serial No. 328,916
4 Claims. (Cl. 178—5.4)

4. In a color television system where during a first field a first phase of a wave is amplitude modulated in accordance with a first color signal, a second phase of the wave is amplitude modulated in accordance with a second color signal and wherein the phase of the first wave is shifted by 180° during a second field, the amplitude modulated waves being combined to form a color carrier during both fields, apparatus for recovering the first and second color signals from the color carrier during the first and second fields with a minimum of crosstalk comprising in combination a first source of waves of the first phase during the first field and the opposite phase during the second field, first means for

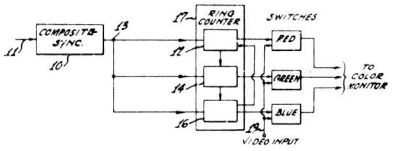


heterodyning the color carrier with the waves provided by said first source, a second source of waves having the second phase during both fields, means for heterodyning the waves provided by said second source with the color carrier, a third source of waves having the first phase during both fields, third means for heterodyning the waves supplied by the third source with the color carrier, a differentiation circuit coupled to the output of the third heterodyning means, and an adder coupled to the output of said second heterodyning means and said differentiation circuit.

2,680,778
COLOR SYNCHRONIZATION FOR COLOR TELEVISION

Peter H. Werenfels, Lawrenceville, and George W. Bain, Jr., New Brunswick, N. J., assignors to Radio Corporation of America, a corporation of Delaware

Application February 23, 1951, Serial No. 212,264
11 Claims. (Cl. 178—5.4)



1. A line sequential color television synchronizing system comprising in combination, means providing a composite synchronizing signal having distinct groups of pulse components including line and field pulses, and wherein said line pulses have a greater time separation period than the time separation of said field pulses, means re-

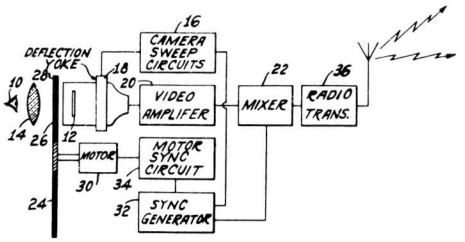
sponsive to said composite signal to provide groups of corresponding pulses having amplitudes inversely proportional to said time periods, thereby providing said line pulses at higher amplitudes than the other pulses, a ring counter color gating circuit having a stage for each of a plurality of video signals which have a plurality of different color component signals and having one predetermined stage biased for operation only with said higher amplitude pulses, means connecting each stage of said ring counter circuit to the output circuit of said means responsive to said signal whereby said predetermined stage of said ring counter corresponding to a given color is initiated only with said high amplitude line pulses to effect color synchronization by starting each field with the initial line pulse for said given color, and the further stages of said counter being initiated by lower amplitude line impulses of said composite signal to maintain the counter sequence in synchronism over the entire color field and set the counter for operation at the beginning of each field.

2,681,946

COLOR IMAGE REPRODUCTION SYSTEM

Humboldt W. Leverenz, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application September 24, 1949, Serial No. 117,583
14 Claims. (Cl. 178—5.4)



1. In a system in which a color image is to be reproduced by viewing a plurality of different complementary color records, means for producing images of ultraviolet radiation representative of predetermined component color records of the color image, a plurality of photoluminescent targets each responsive to the ultraviolet radiation of said image producing means to radiate a respective visible light image corresponding to a different complementary color record, means for focussing said ultraviolet image onto said photoluminescent targets, and means supporting said luminous targets in moving relation to said image source for effectively combining the visible light images with one another to produce a composite color image.

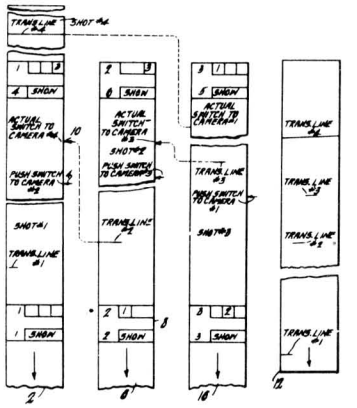
2,682,572

PHOTOGRAPHIC RECORDING OF TELEVISION PROGRAMS

George K. Graham, Oceanside, N. Y., assignor to Radio Corporation of America, a corporation of Delaware

Application June 1, 1951, Serial No. 229,487
8 Claims. (Cl. 178—5.8)

1. A studio camera comprising in combination a motion picture camera adapted to make a photographic record on a strip of film and a television camera adapted to produce video signals, a video signal output terminal, switching apparatus adapted to apply the video signal derived by said television camera to said output terminal, a light positioned so as to fog a portion of film passing through said motion picture camera, a



parallel circuit including condenser and resistor connected in series with said light, a source of fixed potential, said switch also being adapted to connect said source of fixed potential in series with said light and said parallel resistor and condenser circuit at the instant the video signals are applied to said video output terminal.

II-C. Radar (includes Direction and/or Position Finding)

2,674,720

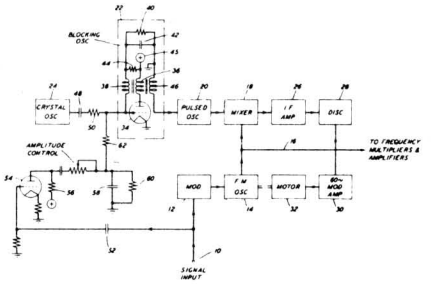
FREQUENCY CONTROL CIRCUIT

Nean Lund, Plainfield, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York

Application July 16, 1952, Serial No. 299,289
2 Claims. (Cl. 332—19)

1. In an automatic frequency control circuit for a frequency modulation transmitter oscillator, an auxiliary oscillator tunable to a frequency related to that desired for said transmitter oscillator, a blocking oscillator arranged to pulse said auxiliary oscillator at a fixed repetition rate, a mixer combining the outputs of the pulsed auxiliary and transmitter oscillators, means for deriving a control signal from said combined output for application to control the frequency of said transmitter oscillator, means for deriving

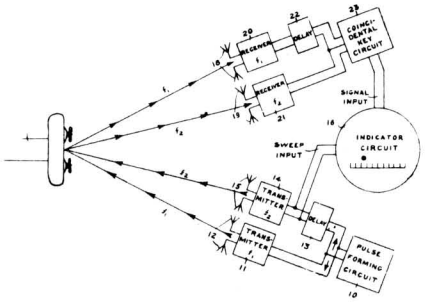
an amplified sample of the modulating signal for said transmitter oscillator, and means for intro-



ducing a 90 degree phase shift in said sample and applying said sample to modulate the output of said blocking oscillator.

2,676,317
PULSE ECHO RADAR SYSTEM EMPLOYING A DOUBLE CHANNEL
Ellison S. Purington, Gloucester, Mass., assignor, by mesne assignments, to Radio Corporation of America, New York, N. Y., a corporation of Delaware
Application January 12, 1945, Serial No. 572,496
8 Claims. (Cl. 343—13)

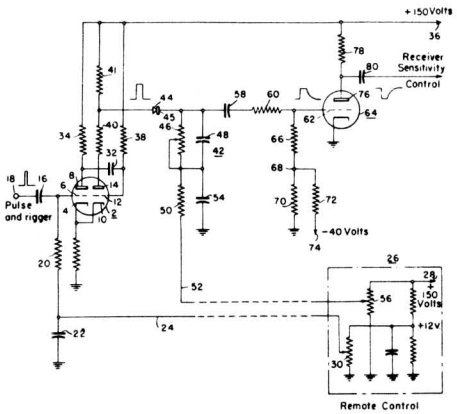
1. A distance measuring system comprising a pulse forming circuit producing a series of pulses, a pair of radiant energy transmitters connected to be modulated by said pulses to propagate radiant energy pulses over a pair of radio frequency channels, a delay circuit interposed between said pulse forming circuit and one of said transmitters to introduce a predetermined time interval between the pulses on the respective channels, a pair of receivers selective of the respective channels to receive said pulses after reflection from an object, a key circuit connected to the output of both receivers and responsive only to simultaneous pulses from both receivers, a delay circuit in



the output circuit of the receiver responsive to the earlier pulse and suited to introduce a delay corresponding to that of said first delay circuit so that the pulses are made concurrent at the key circuit when received in the predetermined sequence, and indicator means actuated by the conjoint action of said transmitters and said key circuit to indicate the distance travelled by said pulses to said object.

2,679,589
SENSITIVITY TIME CONTROL WITH REMOTE CONTROL
Kent M. Mack, Baltimore, Md., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application August 25, 1951, Serial No. 243,718
2 Claims. (Cl. 250—27)

1. A receiver sensitivity control comprising a multivibrator having a control element, connections for applying pulses to said control element, means for applying a variable direct-current potential to said control element so as to superimpose said direct-current potential on said pulses, a clipper circuit connected to said multivibrator so as to receive a pulse in response to current through said multivibrator, means for applying a variable direct-current potential to said clipper circuit so as to control the action of said clipper circuit on pulses received from said multivibrator, an amplifier inverter con-

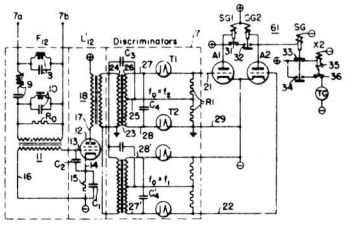


nected to said clipper so as to receive pulses therefrom, and connections for applying a potential responsive to the current through said amplifier to a receiver sensitivity control.

II-D. Telegraphy

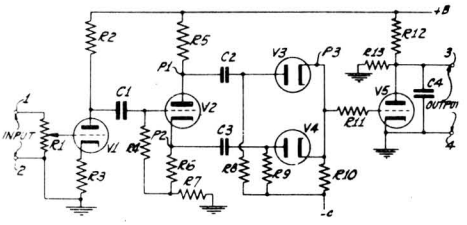
2,677,014
TONE-SHIFT CARRIER
John D. Moynihan, Bloomfield, N. J., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application June 29, 1950, Serial No. 171,192
10 Claims. (Cl. 178—51)

1. A frequency-shifting communication-system comprising a continuously transmitting transmitter normally transmitting a first frequency, signalling controller-means acting on the trans-



mitter for shifting its frequency to a distinguishably different frequency, signal-receiving means for selectively responding to the shifted frequency of said transmitter, and signal-blocking means selectively responsive to the unshifted frequency of the transmitter for preventing a signal-response.

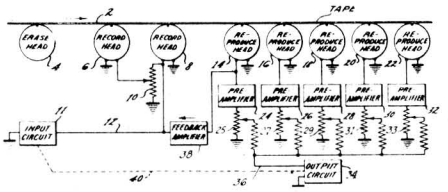
2,678,387
TONE CONVERTER
Philip E. Volz, Florham Park, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application April 11, 1950, Serial No. 155,233
3 Claims. (Cl. 250—27)



1. In a signal converter, means for deriving from an input wave two corresponding voltage waves of opposite relative phase, a full-wave rectifier differentially excited by said waves, an output impedance coupled to said rectifier, a single-ended electron discharge device having a control grid coupled to said impedance and also having a cathode, means for applying a bias potential to said control grid of a value sufficient to bias said device beyond cutoff, thereby to cause the same to act as a thresholding device at a fixed direct current thresholding voltage, a resistor in series in the grid-cathode circuit of said device, said resistor having sufficient resistance to produce a current-limiting bias on said grid in response to the drawing of current by such grid, and an output circuit coupled to said device.

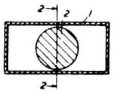
II-E. Other Apparatus (includes Wave Guides, etc.)

2,674,660
ARTIFICIAL REVERBERATION
James R. Ambrose, Indianapolis, Ind., assignor to Radio Corporation of America, a corporation of Delaware
Application December 10, 1952, Serial No. 325,103
5 Claims. (Cl. 179—100.2)



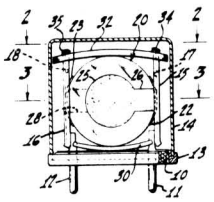
1. An artificial reverberation system of the type using a magnetic record tape, said system comprising, in combination, a plurality of magnetic recording heads, said heads being spaced laterally with respect to the tape for coaction with separate parallel tracks along said tape, said heads also being spaced longitudinally of said tape with respect to each other, and a plurality of reproducing heads spaced along said tape, each of said reproducing heads being of a width substantially equal to the record tape.

2.675.524
ELECTRICAL WAVE GUIDE PROVIDED WITH TUNING PISTONS
John Collard, Hammersmith, London, England, assignor to Electric & Musical Industries Limited, Hayes, England, a British company
Application March 16, 1949, Serial No. 81,656
Claims priority, application Great Britain March 25, 1948
4 Claims. (Cl. 333—98)



3. A waveguide of elongated cross-section having a tuning piston rotatable within the waveguide, said piston having such cross-sectional area in relation to the internal dimensions of the waveguide that a pair of opposite surfaces on said piston are disposed close to but out of contact with areas adjacent said piston on the internal surface of said waveguide where maximum voltage exists, other surfaces on said piston being more widely spaced from said waveguide, said piston also having means for effectively short-circuiting the piston to said areas of said waveguide, an a screw-threaded rod fixed to said piston and engaging a screw-threaded support for rotating the piston to move it axially of said waveguide with the axis of rotation of said piston parallel to the longitudinal axis of the waveguide.

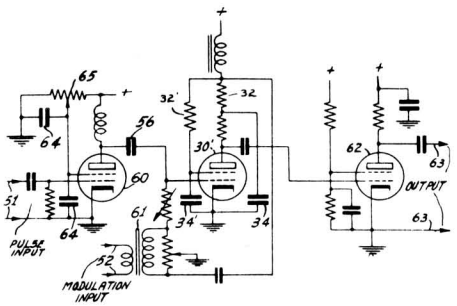
2,676,275
PIEZOELECTRIC CRYSTAL APPARATUS
Robert R. Bigler, Erlton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application February 2, 1953, Serial No. 334,471
9 Claims. (Cl. 310—8.9)



1. A crystal assembly comprising an insulating base, two electrically conductive posts extending from a point at or near said base, said posts having longitudinally extending grooves on facing surfaces, a crystal wafer disposed between said posts with opposite peripheral edges in said grooves, and a strap of insulating material secured to the free ends of said posts to urge the posts against said crystal wafer.

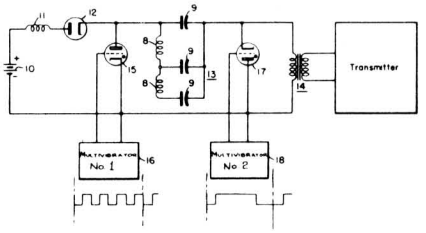
2,676,301
PULSE TYPE MULTIPLEX COMMUNICATION SYSTEM
Clarence W. Hansell, Port Jefferson, N. Y., assignor to Radio Corporation of America, a corporation of Delaware
Application May 28, 1949, Serial No. 96,124, now Patent No. 2,640,921, dated June 2, 1953, which is a division of application Serial No. 495,181, July 17, 1943, now Patent No. 2,478,919, dated August 16, 1949. Divided and this application September 4, 1951, Serial No. 245,036
18 Claims. (Cl. 332—9)

11. A pulse modulator circuit arrangement having input and output circuits and including an electron discharge system having cathode, grid, input control and output anode electrodes, and electrode intercoupling capacitors and resistors arranged to produce a pulse in said output circuit in response to a pulse applied to said input circuit, means to modify said pulses, said means including means to derive modulating voltages of opposite sense, means to apply one of



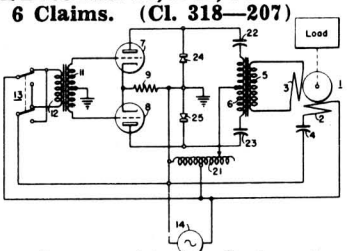
said modulating voltages to said input circuit, and means to apply the other of said modulating voltages to said output circuit whereby the effect of said modulation voltages on the timing of said output pulses is substantially balanced.

2,677,053
PULSE GENERATOR
Albert A. Nims, Jr., Catonsville, Md., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application June 29, 1949, Serial No. 102,125
12 Claims. (Cl. 250—27)



1. A circuit for generating high direct-current voltage pulses, comprising a low voltage, direct-current source, a pulse-forming network connected in series with said source, means for charging said network from said source, a switch connected across the circuit between said source and one side of said network, means for periodically closing said switch, and means connected across the circuit at the other side of the network for discharging said network for a predetermined time while said switch is closed, said discharging means having an impedance substantially less than the surge impedance of said network whereby at the end of a pulse, the voltage across the network will reverse and appear in series with the voltage of said source.

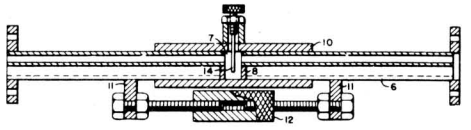
2,677,086
CIRCUIT FOR PHASE SENSITIVE SERVO AMPLIFIERS
Colin H. McAdie, Baltimore, Md., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application December 29, 1951, Serial No. 264,195
6 Claims. (Cl. 318—207)



1. A network comprising a first and a second electron discharge device, each having a cathode, a control electrode and an anode, said cathodes being connected together, a coil having one end thereof connected through a first capacitor to the anode of said first device and having the other end thereof connected through a second capacitor to the anode of said second device, connections for applying a first alternating potential between a point intermediate the ends of said coil and said cathodes, connections between the cathode of said first device and the anode of said first device through a first rectifier, and connections between the cathode of said second device and the anode of said second device through a second rectifier, the anodes of said rectifiers being connected to the cathodes of said electron discharge devices, connections for applying a second alternating potential between the control electrodes and cathodes of said electron discharge

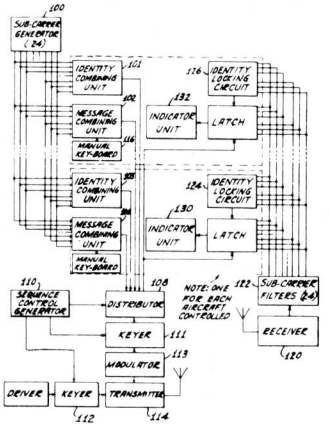
devices, means for reversing at will the polarity of said second alternating potential relative to said first alternating potential, and a work circuit coupled to said coil.

2,677,111
SYMMETRICAL RIDGE WAVE GUIDE MATCHING AND COUPLING DEVICE
William L. Stahl, Chicago, Ill., and Clyde E. Vogeley, Jr., Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application May 14, 1949, Serial No. 93,284
2 Claims. (Cl. 333—33)



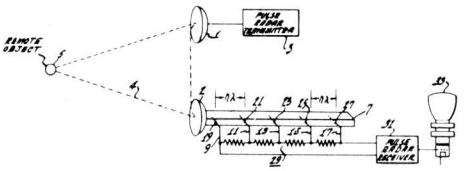
1. In combination, two ridged waveguides so oriented that one is substantially an extension of the other, but separated therefrom by a substantial distance compared to the wave lengths of oscillations to be propagated therein, each of said waveguides having a re-entrant portion and an external trough portion opposite said re-entrant portion, electrically conducting material substantially filling the external troughs opposite the re-entrant portions of said waveguide adjacent the junction of said waveguides, means for connecting said waveguides together comprising a sleeve snugly surrounding an end of each of said waveguides and the conducting material filling the external troughs at the junctions of said waveguides, and means for adjusting said waveguides relative to said connecting means to permit varying the distance between the ends of said waveguides at their junction and thereby vary the impedance presented to oscillations passing from one of the waveguides to the other.

2,677,119
GROUND CONTROLLED AIRCRAFT COMMUNICATION SYSTEM
David George Croft Luck, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application July 24, 1950, Serial No. 175,596
13 Claims. (Cl. 340—23)



1. A signalling system for communication between a superior station and a plurality of subordinate stations, including means to generate a plurality of tones, means to combine a number of said tones to form identity tone combinations and to combine a different number of said tones to form intelligence tone combinations, means to assemble said identity tone and intelligence tone combinations into composite tone combinations, further means to assemble said composite tone combinations in sequence for communication with said subordinate stations, means to generate a carrier wave, means to apply said assembled tone combinations to said carrier wave generating means to modulate said carrier wave, means to transmit said modulated carrier wave to said subordinate stations, means at each of said subordinate stations to demodulate said transmitted carrier wave to derive said tone combinations, means coupled to said demodulating means to produce electric current conditions corresponding to said intelligence tone combinations for a time duration beyond that allotted for communication to each station, intelligence display means, means responsive to said established electric current conditions to actuate said intelligence display means, and means coupled to said demodulating means to permit said intelligence display means to be actuated only if the identity tone combination received corresponds to the identity assigned to the subordinate station under consideration.

2,677,128
SYSTEM FOR IMPROVING THE SIGNAL-TO-NOISE RATIO IN REPETITIVE SIGNAL SYSTEMS
Spencer W. Spaulding, Haddonfield, and Arthur H. Benner, Collingswood, N. J., assignors to Radio Corporation of America, a corporation of Delaware
Application December 29, 1950, Serial No. 203,373
7 Claims. (Cl. 343—17.1)

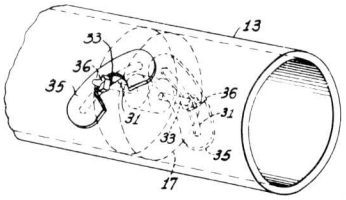


1. A system for increasing the ratio between recurrent pulse echo radio frequency signal strength and attendant statistical noise signal strength during a given echo ranging cycle including time delay means for delaying said recurrent signals and said attendant noise signals for a plurality of time intervals each corresponding to integral numbers of periods of said radio frequency signals, a plurality of means disposed along said time delay means as a function of said intervals each of said means being for deriving portions of said delayed recurrent pulse echo signals and said attendant noise signals, and means coupled to each of said signal deriving means for recombining said derived portions of delayed recurrent pulse echo signals and statistical noise signals whereby the statistical characteristics of noise in said recombination effectively diminishes said attendant noise signal strength and relatively increases said recurrent signal strength, and means coupled to said recombining means for amplification of said recombined signals.

2,678,428
COAXIAL TRANSMISSION LINE TERMINATION

Owen Orlando Fiet, Oaklyn, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application September 7, 1949, Serial No. 114,400
6 Claims. (Cl. 333—97)



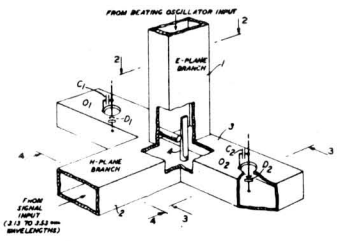
1. A coaxial transmission line section incorporating means to adjust the length thereof without deleterious effect thereto by reason of relative thermal expansion of the inner and sheath conductors of said line section, the sheath conductor of said line section having elongated slots arranged therein diagonally of the axis of said sheath conductor, a sleeve member surrounding the inner conductor of said line section, an insulating member fixed to said sleeve member, guide members fixed to said insulating member and arranged in the slots in said sheath conductor to cause said insulating member and said sleeve member to move axially in response to rotation thereof initially to adjust the length of said transmission line section, and a coil spring interposed between said sleeve member and said inner conductor to provide electrical contact therebetween without restraining relative movement in the axial direction therebetween to maintain the length of said transmission line section substantially constant as initially adjusted.

2,679,582
BALANCED WAVE GUIDE BRANCHING SYSTEM

Charles F. Edwards, Red Bank, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York

Application December 24, 1945, Serial No. 637,124
11 Claims. (Cl. 250—20)

10. A wave-guide assembly comprising: a main wave-guide section having a non-linear impedance at each of the opposite ends thereof; one side of each of said impedances being capacitively coupled to said main wave-guide section; and a

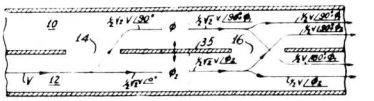


pair of branch wave-guide sections, perpendicular to said main wave-guide section and to each other, extending outwardly from said main wave-guide section.

2,679,631
POWER DIVIDER

Nathaniel I. Korman, Merchantville, and Waldon P. Bollinger, Haddonfield, N. J., assignors to Radio Corporation of America, a corporation of Delaware

Application October 2, 1950, Serial No. 188,032
13 Claims. (Cl. 333—7)



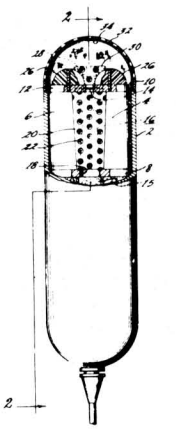
1. A power divider comprising a pair of transmission lines, a pair of spaced linear passive directional couplers between said lines each characterized by a phase change of substantially 90 degrees in energy transferred through the coupler from one line to the other, and each characterized by a transfer of one half the energy incident at the coupler from one line directionally into the other, and means to adjust the effective relative lengths of said lines between the effective points of coupling of said couplers.

2,680,787
UNIAXIAL MICROPHONE

Harry F. Olson, Princeton, John Preston, Metedeconk, and John C. Bleazey, Mercerville, N. J., assignors to Radio Corporation of America, a corporation of Delaware

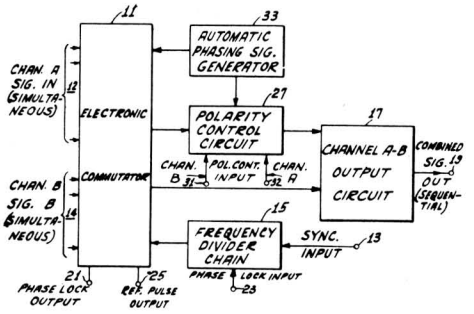
Application November 30, 1951, Serial No. 259,138
11 Claims. (Cl. 179—115.5)

1. A pressure gradient responsive ribbon type microphone comprising a magnetic field structure generally cylindrical in shape having substantially flat circular ends, said field structure defining an elongated air gap in one of said circular ends, a conductive vibratile member supported in and substantially coextensive with said



air gap, a plurality of successively spaced baffles effectively constituting a low frequency acoustical impedance interposed between said vibratile member and the ambient, and a pair of anti-diffraction lobes mounted on said end adjacent to said air gap.

2,682,574
ELECTRONIC DIPLEX TRANSMITTING DISTRIBUTOR
Arthur Eugene Canfora, Brooklyn, and Anthony Liguori, New York, N. Y., assignors to Radio Corporation of America, a corporation of Delaware
Application March 29, 1952, Serial No. 279,432
18 Claims. (Cl. 178—61)



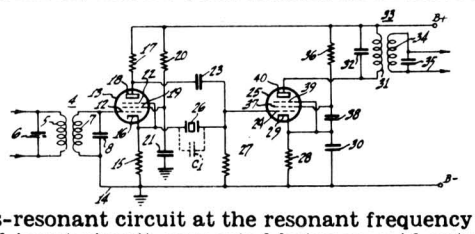
1. A multi-channel transmitting distributor system for translating multi-element, fixed-length code characters from separate and simultaneous form to serial form including a signal element regenerator comprising a reciproconductive circuit having at least one stable state of equilibrium and complementary output circuits, means to trigger said reciproconductive circuit to one state of equilibrium at signal element rate, means to apply pulses corresponding to signal elements of one nature to said reciproconductive circuit to trigger said circuit to the other state of equilibrium, whereby the output circuits of said reciproconductive circuit provide separate output signal trains of opposite polarity directly and indirectly representative of the input signals, an electronic switching circuit coupled to said signal element regenerator circuit, output terminals coupled to said switching circuit, said electronic switching circuit being arranged to connect said output terminals selectively to the complementary output circuits of said signal element regenerator circuit in response to applied switching potential, a bistable reciproconductive system coupled to said electronic switching circuit to develop and apply said switching potential, control circuits having complementary inputs connected to said reciproconductive system, means to apply pulses to said reciproconductive system at channel rate to trigger the same to alternate states of conduction, means to apply pulses to one of the inputs of said control circuit to reverse the triggering of said reciproconductive system, means to apply potential to the other of said inputs to nullify the application of the polarity reversing pulses, a gating circuit arranged to serially apply pulses indicative of applied input signal elements of said one nature to said reciproconductive circuit and means to apply pulses derived from at least a portion of said gating circuits to said control circuits to determine the polarity of the output signal train applied to said output terminals.

SECTION III. CIRCUITS OF GENERAL APPLICATION

III-A. Amplifiers

2,675,432
REGENERATIVE FEEDBACK CIRCUIT
Wen Yuan Pan, Collingswood, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application April 4, 1950, Serial No. 153,783
3 Claims. (Cl. 179—171)

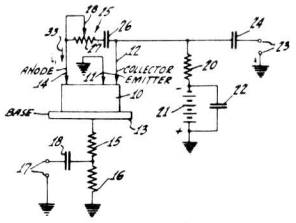
1. In a signal transmission system, the combination of an electron tube having a cathode, a control grid and an anode; a resonant input circuit and an unbypassed cathode resistor coupled in series arrangement between said control grid and said cathode; an output impedance coupled to said anode; an output capacitor connected to said anode; and a crystal forming an effective se-



ries-resonant circuit at the resonant frequency of said input circuit connected between said output capacitor and said cathode, whereby signal energy of a frequency equal to said input resonant circuit is fed back from said output circuit to compensate for the degenerative effect of said cathode impedance.

2,675,433
DEGENERATIVE AMPLIFIER
Jacques I. Pantchechnikoff, now by change of name Jacques Isaac Pankove, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application April 27, 1950, Serial No. 158,359
7 Claims. (Cl. 179—171)

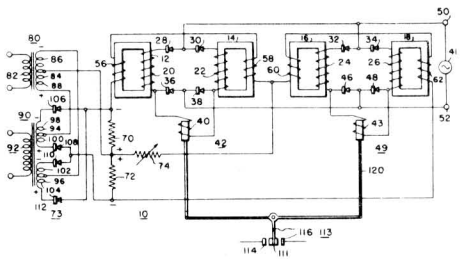
1. A degenerative amplifier comprising a semiconductor device, said device including a semiconducting body, a base electrode, an emitter electrode and a collector electrode in contact with said body, a further electrode in rectifying contact with said body and spaced from said emitter and collector electrodes such a larger distance than the distance between said emitter and collector electrodes as to prevent substan-



tial interaction between said further electrode and said emitter and collector electrodes, said further electrode cooperating with said base electrode to provide a rectifier, said base electrode, said emitter electrode and said collector electrode cooperating to provide an amplifier; a first impedance element connected in circuit between said base and emitter electrodes, means for impressing a reverse bias voltage between said collector and base electrodes, a second impedance element connected in circuit between said collector and emitter electrodes, an input circuit connected across a portion of said first impedance element for impressing an input signal thereon, an output circuit connected across said second impedance element for deriving an amplified output signal therefrom, and a feedback connection between said further electrode and said collector electrode to impress said amplified output signal on said further electrode and to develop a current through said first impedance element and said base electrode in response to a predetermined polarity of said output signal, said current opposing the current developed simultaneously by the opposite polarity of said input signal across said first impedance element and on said base electrode.

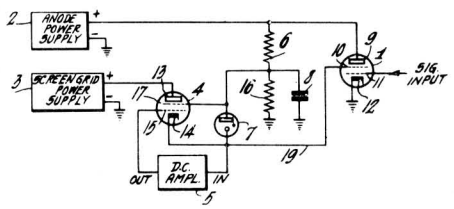
2,677,099
MAGNETIC AMPLIFIER
Frank J. Rau, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application March 29, 1952, Serial No. 279,327
5 Claims. (Cl. 323—89)

1. In a push-pull magnetic amplifier, the combination comprising, a plurality of magnetic core members, a reactor winding disposed in inductive relationship with each of the magnetic core members, a rectifier in series circuit relationship with each of the reactor windings so as to permit passage of current in only one direction therethrough, means for applying an alternating current voltage to each of the series connected reactor windings and rectifiers, a control winding disposed in inductive relationship with each of the magnetic core members, two resistors connected in series circuit relationship, electrical apparatus electrically connected to the resistors for



producing both a substantially constant biasing voltage and a variable control voltage across each of the resistors, a resistance element, circuit means for connecting one of said two resistors, the resistance element, and one of the control windings in series circuit relationship, another circuit means for connecting the other of said two resistors, the resistance element, and another of the control windings in series circuit relationship so that each control winding functions as both a biasing winding and a control winding, and means responsive to the current flow through the reactor windings and actuated in response to the variable control voltage across each of said two resistors to perform a predetermined operation.

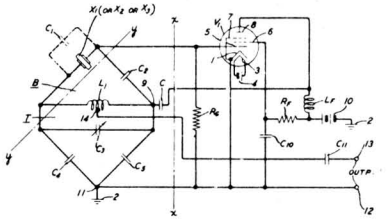
2,678,391
PROTECTIVE CIRCUIT
Lester S. Lappin, Merchantville, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application July 2, 1952, Serial No. 296,801
16 Claims. (Cl. 250—27)



1. A power supply circuit for a tube of the screen grid type comprising an anode power supply, a separate screen grid power supply, means coupling the anode of said tube to the positive terminal of said anode power supply, an electron discharge device of the screen grid type having at least an anode electrode, a cathode electrode and a screen grid electrode, means connecting said anode electrode to the positive terminal of said screen grid power supply, means connecting said cathode electrode to the screen grid of said tube, and means for applying a positive bias potential derived from said anode power supply to said screen grid electrode.

III-B. Oscillators (includes Multivibrators)

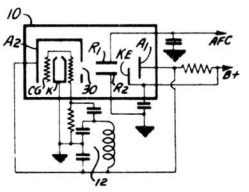
2,676,258
HARMONIC CRYSTAL OSCILLATOR
John F. Laidig, Mine Hill, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York
Application July 20, 1949, Serial No. 105,741
17 Claims. (Cl. 250—36)



1. Harmonic crystal oscillator apparatus comprising an electronic gain source having input and output circuits, means including a bridge network coupling said input circuit with said output circuit, said coupling means including a connection to said bridge network forming a common return circuit for both said input and output circuits of said gain source, said bridge network including in one part thereof a series-resonant harmonic mode frequency piezo-electric crystal body which is disposed in circuit between said input and said output circuits, and said bridge network including directly therein as another and unitary component part thereof a single tuned tank circuit which is disposed in circuit between said crystal body and said output circuit, said tuned circuit being tuned substantially to said harmonic mode frequency of said crystal body, and means comprising a frequency discriminator capacitor disposed in circuit between said tuned circuit and said gain source output circuit and having a capacitance value sufficient for transmitting oscillations from said output circuit to said input circuit at said desired harmonic mode frequency of said crystal body while simultaneously attenuating and blocking oscillations sufficiently at the undesired fundamental mode frequency of said crystal body to substantially destroy oscillation of said apparatus at said undesired fundamental mode frequency.

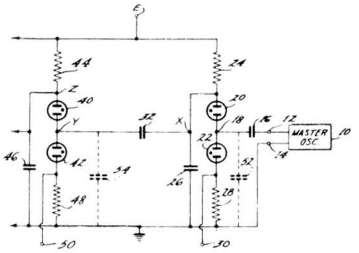
2,679,592
GENERATOR AND FREQUENCY CONTROL
Jerome Kurshan, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application August 31, 1948, Serial No. 46,943
3 Claims. (Cl. 250—36)

1. In apparatus for generating wave energy and for controlling the frequency of the generated wave energy, an electron discharge device having an electron emitting cathode, a control grid, an apertured anode enclosing said cathode and control grid, a second anode positioned to



receive electrons passing through said aperture, a knife edge electrode and electron deflecting electrodes in said device between said aperture and said second anode, an external, lumped-reactance wave generating circuit coupled to said first anode, said control grid and said cathode, and means for applying a control potential to said deflecting electrodes to alter the number of electrons intercepted by said knife edge electrode and to alter the reactance of said device and the frequency of the wave energy generated.

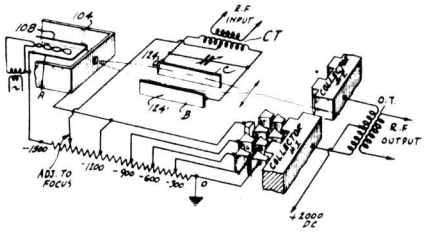
2,680,198
FREQUENCY DIVIDER
John D. Bick, Moorestown, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application October 30, 1951, Serial No. 253,868
12 Claims. (Cl. 250—36)



4. In a frequency divider system wherein a frequency from a master oscillator is divided into a series of octave cascades, a plurality of relaxation oscillators connected in cascade, each of said relaxation oscillators comprising a pair of twin-element, gaseous discharge tubes connected in series and having a common junction therebetween, a charging resistor connected in series with one of said tubes, an output impedance connected in series with the other of said tubes, a charging capacitor connected across said tubes and said output impedance, means for applying a source of constant potential to all of said relaxation oscillators whereby each of said relaxation oscillators will produce oscillations of a frequency which is between one-third and one-half of a submultiple of the frequency of said master oscillator, and high impedance coupling means between successive relaxation oscillators in said cascade.

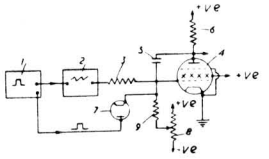
III-C. Miscellaneous

2,674,661
ELECTRON MULTIPLIER DEVICE
Russell R. Law, Princeton Township, Mercer County, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application August 12, 1948, Serial No. 43,851
24 Claims. (Cl. 179—171)



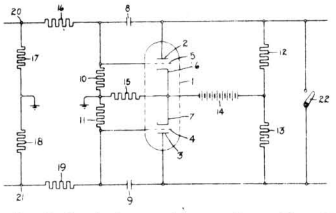
1. An electron multiplier comprising at least three spaced dynode elements, each element having two concave secondary electron emitting surfaces on opposite sides thereof, the dynode elements being staggered so that secondary electrons released from two dynode elements fall on the secondary electron emitting surfaces of an intermediate dynode element.

2,675,469
INTEGRATING CIRCUIT ARRANGEMENT
Maurice Geoffrey Harker, Pinner, John Bruce Smith, Ealing, London, and Peter Frederic Thomas Cryer Stillwell, Haddenham, Aylesbury, England, assignors to Electric & Musical Industries Limited, Hayes, England, a British company
Application February 17, 1948, Serial No. 8,996
Claims priority, application Great Britain February 18, 1947
3 Claims. (Cl. 250—27)



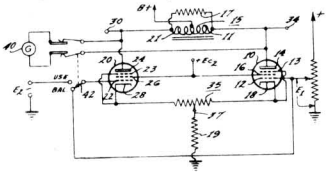
1. An integrating circuit arrangement comprising a thermionic valve, an integrating capacity connected between an output electrode of said valve and an input electrode thereof, a unidirectionally conducting device connected to said input electrode, a source of pulses, means for feeding said pulses to said unidirectionally conducting device for rendering said device conducting at intervals to bring the potential of said output electrode to the same predetermined value for each integrating cycle, means for feeding to said integrating capacity a sawtooth variation to produce a parabolic waveform from said valve, and means for supplying to said integrating capacity a further potential for integration thereby, said means for supplying a further potential comprising a potentiometer for connection to a source of potential and having a tapping point, and a resistance in series with said capacity, said tapping point being connected to said resistance to integrate the potential derived from the tapping point together with said sawtooth variations.

2,675,471
INTEGRATING CIRCUIT
Theodore M. Berry, Schenectady, and George R. Fawkes, Jr., Scotia, N. Y., assignors to General Electric Company, a corporation of New York
Application April 13, 1950, Serial No. 155,712
2 Claims. (Cl. 250—27)



1. An electric integrating circuit comprising, a pair of integrating networks connected in push-pull; each network comprising an electric discharge device having a cathode, an anode and a control electrode, a source of uni-directional voltage and a first resistor connected in series in a cathode-anode circuit of said device, a second resistor connected intermediate the cathode electrode of said device and a source of reference potential, a third resistor connected intermediate the control electrode of said device and said source of reference potential, a capacitor connected between the anode and the control electrode, said capacitor having a capacitance substantially larger than the inter-electrode capacitance of said device, a fourth resistor connected between said control electrode and an input terminal whereby an input signal voltage to be integrated may be supplied between the respective input terminals of each integrating network; and output connections to the anodes of the two discharge devices for delivering the integral with respect to time of the signal voltage appearing across said anodes due to a voltage feedback integrating action of said capacitors.

2,676,253
ELECTRONIC COMPARING CIRCUIT
William R. Ayres, Oaklyn, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application January 30, 1952, Serial No. 269,007
6 Claims. (Cl. 250—27)



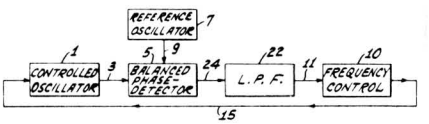
5. A voltage comparing device comprising, a first electron discharge tube having at least an anode, a cathode, and a control grid, means to apply a fixed reference voltage to the control grid of said first tube, a second electron discharge tube having at least an anode, a cathode, and a control grid, means to apply a variable voltage to the control grid of said second tube, a saturable reactor including windings having a first and a second section each having two ends and being wound around a common core, said first

section having a first end connected to the anode of said first tube, said second section having a first end connected to the anode of said second tube, a source of operating potential, two calibrating resistors, one of said calibrating resistors connecting the second end of said first section to said source of operating potential, the other of said calibrating resistors connecting the second end of said second section to said source of operating potential, said calibrating resistors being selected such that the sections in series with respective calibrating resistors have equal impedances, said sections being positioned around said common core such that equal currents through said sections cause a null flux condition through said saturable reactor, a potentiometer having two ends and a slider, one end of said potentiometer being connected to the cathode of said first tube and the other end being connected to the cathode of said second tube, a cathode bias resistor connected between the slider of said potentiometer and said cathode bias resistor, a galvanometer connected between the second ends of said sections, said potentiometer slider being positioned in order that no current flows through said galvanometer when a voltage equal to said fixed voltage is applied to the grid of said first tube and to the grid of said second tube, and means to derive an output from the anodes of said first and second tubes proportional to the rate of change of flux through said saturable reactor with respect to time.

2,676,260
FREQUENCY CONTROL SYSTEM

Donald S. Bond and Donald G. Moore, Princeton, N. J., assignors to Radio Corporation of America, a corporation of Delaware

Application December 3, 1949, Serial No. 130,964
11 Claims. (Cl. 250—36)

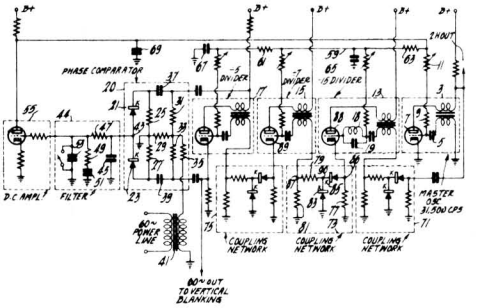


1. A frequency control system comprising a source of oscillatory energy the frequency of which is to be controlled, a source of oscillatory energy of stable frequency, a diplexer unit having a plurality of intercoupled ultra-high frequency wave transmission members terminating with a pair of conjugate input couplings and a pair of output couplings, means for supplying oscillatory energy of only said controlled frequency from said first-named source to one of said input couplings, means coupling the second-named source to the other input coupling, thereby to supply oscillatory energy of only said stable frequency to said other input coupling, means for controlling the frequency of said first-named source from said two output couplings, said output couplings having therein energy 180° out of phase and other energy in phase, said last-named means having two branches each including therein a high pass filter and having therein only circuits whose bandwidths are large in comparison with the spectrum of the significant energy components of the wave impressed on said circuits, said last-named means including a rectifier coupled to each of said output couplings, an output load coupled to each of said rectifiers, and means for applying the voltages developed across said output loads to said first-named source to vary the frequency thereof, whereby the accuracy of the frequency control effected by said system is rendered substantially independent of temperature.

2,677,098
COUPLING CIRCUITS

Winthrop S. Pike, Princeton, and Jeremiah M. Morgan, Cranbury, N. J., assignors to Radio Corporation of America, a corporation of Delaware

Original application March 6, 1951, Serial No. 214,062. Divided and this application November 30, 1951, Serial No. 259,106
4 Claims. (Cl. 323—74)

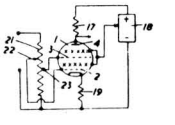


1. A unidirectional coupling network comprising a first diode having an anode and a cathode, a connection including a first resistor between the anode of said first diode and a point of fixed potential, a second diode having an anode and a cathode, a connection between the cathode of said first diode and the cathode of said second diode, a connection between the anode of said second diode and said point of fixed potential for maintaining the anode of said second diode at said fixed potential, and a connection including a second resistor betweeen the cathodes of said first and second diodes and said point of fixed potential, the junction of said first resistor and said anode of said first diode comprising a signal input terminal for said network, and a signal output terminal at the end of said second resistor remote from said point of fixed potential.

2,679,002
THERMIONIC CIRCUITS

Eric Lawrence Casling White, Iver, England, assignor to Electric & Musical Industries Limited, Hayes, England, a company of Great Britain

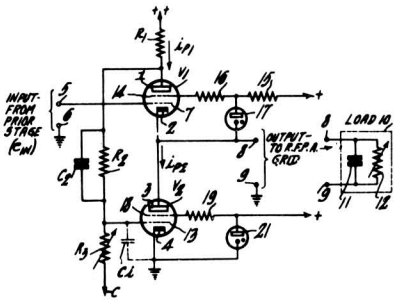
Application February 18, 1948, Serial No. 9,232
Claims priority, application Great Britain February 19, 1947
2 Claims. (Cl. 250—27)



1. A circuit arrangement comprising a thermionic valve having an output electrode and two

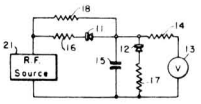
pairs of control electrodes, an electrode of each pair being a common cathode of said valve, said pairs of control electrodes being each capable of independently controlling the electron stream of said valve, an untuned output circuit connected to said output electrode, a source of signal waveform, means for applying signals from said source to one of said pairs of control electrodes, and means for applying signals of the same waveform, frequency and phase to the second pair of control electrodes but in inverse sense to the signals applied to said first-mentioned pair to effect individual independent control on said electron stream with the amplitude of said signals and the biassing of said electrodes proportioned to afford continuous conductivity of said valve throughout substantially the whole cycle of the applied waveform and to set up in said output circuit a component having an instantaneous amplitude substantially proportional to the square of the instantaneous amplitude of said signal waveform.

2,679,029
MODULATOR CIRCUIT
Robert S. Jose, Haddonfield, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application May 15, 1952, Serial No. 287,915
13 Claims. (Cl. 332—64)



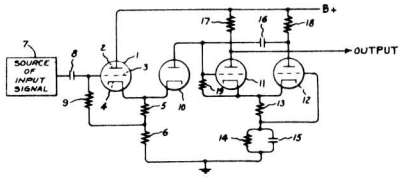
1. In a modulator circuit for supplying modulating voltages to a load including capacitance, a pair of electrode structures each including an anode, a cathode and a control electrode, means connecting the anode-cathode paths of said structures in series across a single potential source, means coupling the said load to the cathode of a first one of said structures, means for applying a modulating voltage to the control electrode of said first structure, and a connection capable of passing direct current coupling the anode of said first structure to the control electrode of a second one of said structures, the peak charging current for the load capacitance being of a value, at high time rates of change of modulating voltage, such as to develop a voltage at the anode of said first structure which is sufficient to bias said second structure to cutoff.

2,679,584
DETECTOR
Angus A. Macdonald, Catonsville, Md., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application June 15, 1949, Serial No. 99,243
4 Claims. (Cl. 250—27)



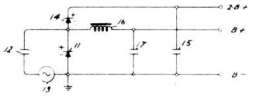
1. A linear detector circuit comprising an input circuit having resistance, a pair of similar rectifier elements connected in series so as to conduct in the same direction and connected across said input circuit, an output circuit having a first resistor connected across one of said elements, and a second resistor having substantially the same resistance as said first resistor connected across the other of said elements and the resistance of said input circuit.

2,679,586
PULSE WIDENING CIRCUIT
Charles R. Holland, Syracuse, N. Y., assignor to General Electric Company, a corporation of New York
Application September 27, 1950, Serial No. 187,119
3 Claims. (Cl. 250—27)



1. A circuit for increasing the time duration of a voltage pulse comprising first and second electron discharge devices, each of said devices being provided with an anode, a cathode and a control electrode, said devices being provided with a common cathode resistor, an electrical connection for supplying a bias to said second discharge device from said cathode resistor, a resistor connected between the control electrode and the cathode of said first discharge device, a coupling capacitor interconnected between the anode of said second discharge device and the control electrode of said first discharge device, a resistor and a capacitor connected in parallel relation and located in the common cathode circuit of said first and second discharge devices, a cathode follower including a third electron discharge device being provided with an anode, a cathode and a control electrode, and a cathode resistor, a unilateral impedance connected to conduct electrons from the cathode of said third discharge device to the control electrode of said first discharge device to produce a voltage pulse at the anode of said first device which is wider than a voltage pulse supplied to the control electrode of said third discharge device.

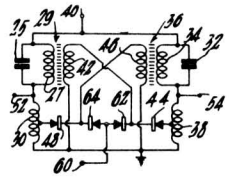
2,682,002
TRANSFORMERLESS VOLTAGE MULTIPLIER CIRCUITS
Van R. Gibson, Jr., North Syracuse, N. Y., assignor to General Electric Company, a corporation of New York
Application July 25, 1952, Serial No. 300,885
8 Claims. (Cl. 307—110)



8. A power supply circuit adapted to produce a plurality of direct-current potentials that are integrals of a fundamental direct component of a source of alternating-current potential having one side established at a reference potential, comprising in combination, a first series circuit comprised of a first rectifier and of a first capacitor, the terminals of said first series circuit adjacent said first capacitor being adapted for connection to the side of said source that is at the reference potential, the terminal of said first series circuit adjacent said first rectifier being adapted for connection to the side of said source remote from the reference potential, a second series circuit comprised of a second rectifier and a second capacitor, means for connecting the terminal of said second series circuit that is proximate said second rectifier to the junction between said first rectifier and said first capacitor, means for connecting the other terminal of said second series circuit to the terminal of said first series circuit adjacent said first rectifier, and low-pass filtering means having a high impedance for the frequency of the alternating-current potential produced by said source and also having an output terminal at an intermediate point thereon, said low-pass filtering means being connected between the terminal of said first series circuit adjacent said first capacitor and the junction between the rectifier and the capacitor of the second series circuit.

2,682,615
MAGNETIC SWITCHING AND GATING CIRCUITS
George Clifford Sziklai and Kerns Harrington Powers, Princeton, N. J., assignors to Radio Corporation of America, a corporation of Delaware
Application May 28, 1952, Serial No. 290,384
10 Claims. (Cl. 307—88)

1. Apparatus including the combination of a first saturable reactor and a second saturable reactor, each of said saturable reactors having at least a primary winding and a secondary winding, a capacitance connected across the secondary winding of said first saturable reactor, another capacitance connected across the secondary



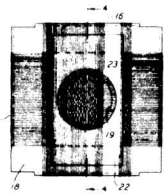
winding of said second saturable reactor, a first inductance connected between one end of the secondary winding of said first saturable reactor and ground reference potential, a second inductance connected between one end of the secondary winding of said second saturable reactor and ground reference potential, and means saturating said first saturable reactor and said second saturable reactor alternately.

SECTION IV. TUBES

IV-A. Receiving

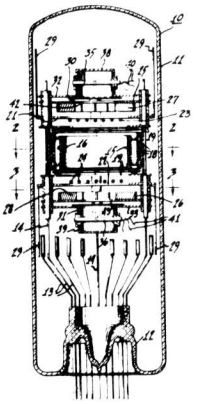
2,678,486
GRID FOR ELECTRON DISCHARGE DEVICES
Arthur J. Chick, Summit, and Lawrence J. Speck, Basking Ridge, N. J., assignors to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York
Application October 11, 1949, Serial No. 120,652
5 Claims. (Cl. 29—25.14)

1. The method of fabricating grids for electron discharge devices comprising winding grid wires around two frames having a separator between them, heating the wires and the frames so that the frames expand and introduce a permanent set into the wires, additionally heating the separator while maintaining the temperature of the frames and wires substantially constant until the separator causes said frames to separate causing an additional elongation of the wires, and attaching the wires to the frames following the separation of the frames and this additional elongation.



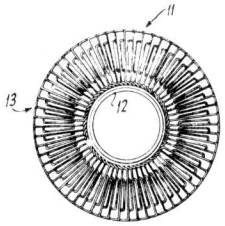
2,679,016
GAS DISCHARGE DEVICE
Edward O. Johnson, Princeton, and Charles E. Curtis and Michael A. Colacello, Trenton, N. J., assignors to Radio Corporation of America, a corporation of Delaware
Application April 9, 1953, Serial No. 347,690
13 Claims. (Cl. 313—38)

1. A gas discharge device, comprising a sealed envelope having an ionizable medium therein, a hollow open ended thermionic cathode within said envelope having emissive material on the inside and having corrugated inner and outer surfaces, a heater element wound around said cathode in the indentations of said corrugated surface but insulated therefrom, a heat shield concentrically mounted around said cathode and said heater element and having an apertured end plate on each end thereof extending toward the axis of said cathode, said heat shield being connected to said cathode, a pair of apertured control electrode baffle members one spaced adjacent each end plate of said heat shield, control electrode wires spanning the aperture in each of said control electrode baffle members, a plurality of heat radiation fins connected to the outer periphery of each of said baffle members and extending along the inside of said envelope away from said cathode, a pair of hollow tubular open ended anodes each having one open end arranged adjacent one of said baffle members but insulated therefrom, a pair of apertured inwardly extending anode end plates one connected to the other end of each of said anodes, a plurality of anode vanes connected to each of said anodes and to their respective end plates, said anode vanes being disposed radially around the axis of said anode and extending theretoward, a pair of apertured constricting electrodes one extending across each of the apertures in each of said anode end



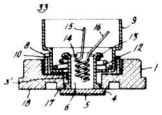
plates and insulated therefrom, the apertures in said apertured constricting electrode being smaller than the mean free path of an electron in said ionizable medium, a pair of tubular auxiliary thermionic cathodes each being arranged substantially perpendicular to the axis of said hollow cathode and one arranged adjacent each of said apertured constricting electrodes on the side thereof removed from said hollow cathode, and a pair of substantially cup-shaped auxiliary cathode shielding members each surrounding one of said auxiliary cathodes and connected thereto.

2,680,009
COOLING UNIT
Anthony G. Nekut, Lancaster, Pa., assignor to Radio Corporation of America, a corporation of Delaware
Continuation of abandoned application Serial No. 68,173, December 30, 1948. This application February 25, 1953, Serial No. 338,749
7 Claims. (Cl. 257—263)



1. A cooling unit for an electron discharge device having an external anode, the unit comprising: a means for attaching the unit to the outside surface of said anode: an array of similar planar fins each attached along one of its edges to said means and extending therefrom in a plane which is parallel to the axis of the anode, each of said planar fins having a projecting flange on the inside and outside portion thereof which form an inner and outer tubular wall, said planar fins being spaced at an increasing distance one from another in a radial direction, the spacings between different pairs of adjacent fins being substantially equal; each of said fins having a plurality of successively positioned elongated slots each of a small width as measured in the direction of said axis as compared to the length of said slot and each extending with its long axis perpendicular to the axis of the said anode; a planar rib extending over each of said slots and lying on one side thereof in a plane which is intermediate that of the fin having said slot and the plane of the fin next adjacent to it on said side, said intermediate plane being parallel to said axis of the anode and inclined in relation to the plane of its supporting fin, the spacing between the fin and the intermediate plane increasing in a radial direction from said anode; each rib of each fin being connected thereto only at the ends of its corresponding slot, whereby a fluid coolant which is projected at an end of said cooling unit in the direction of the axis of said anode to flow between said fins will not be retarded by the friction of continuous surfaces unbroken for the full width thereof.

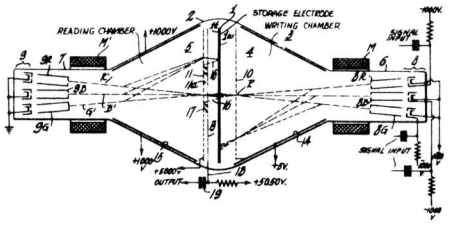
2,680,824
ELECTRIC DISCHARGE DEVICE
James E. Beggs, Schenectady, N. Y., assignor to General Electric Company, a corporation of New York
Application August 16, 1950, Serial No. 179,859
11 Claims. (Cl. 313—250)



1. A cathode subassembly for an electric discharge device comprising a disk-like insulator having a central aperture therethrough, a bearing surface surrounding said aperture on one surface of said insulator, a generally cylindrical cathode structure positioned in said aperture and including an outwardly extending bearing surface engaging the bearing surface of said insulator, a hollow generally cylindrical cathode terminal having an inwardly directed flange engaging the opposite side of said insulator and spring means interposed between said inwardly directed flange and said cathode structure for urging said cathode structure into engagement with the bearing surface of said insulator and electrically connecting said cathode and said cathode terminal.

IV-C. Cathode Ray and Photo-electric

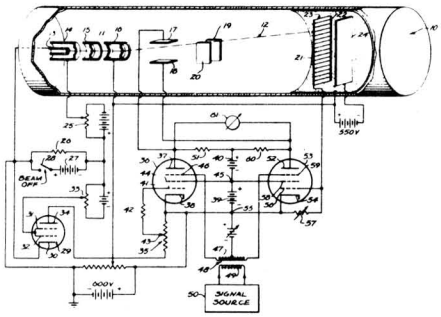
2,674,704
STORAGE TUBE FOR COLOR TELEVISION SIGNALS, ETC.
Paul K. Weimer, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application December 28, 1950, Serial No. 203,125
8 Claims. (Cl. 315—12)



1. An electron-storage device comprising an evacuated envelope containing a storage-electrode, a source of electrons, a mask containing a multiplicity of apertures mounted between said source and said storage electrode, and means for directing electrons from said source upon a surface of said storage-electrode along separate paths that diverge adjacent to said mask, whereby electrons traveling along said separate paths impinge upon respectively separate areas of said surface of said storage-electrode.

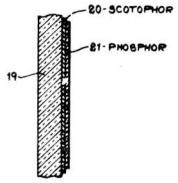
2,675,500
QUANTIZING BIAS INSERTION CIRCUIT
Saul Kuchinsky, Philadelphia, Pa., assignor to National Union Radio Corporation, Orange, N. J., a corporation of Delaware
Application February 11, 1952, Serial No. 270,946
11 Claims. (Cl. 315—21)

1. A beam holding arrangement for the beam of a cathode ray tube, comprising means to develop a beam of focused electrons, a single beam holding electrode on which said beam is arranged to impinge and having a series of spaced conductors one for each holding position of the beam, a pair of beam deflectors, a pair of grid-controlled tubes each having first and second input circuits and each having an output circuit, a source of variable voltage, means connecting said source in opposed balanced relation to the first input circuit of each of said pair of tubes, means connecting the said holding grid to only the second input circuit of one tube of said pair, a third grid control tube, and means connecting the second input



circuit of the other tube of said pair to the anode-cathode circuit of said third tube.

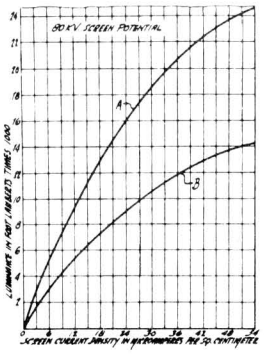
2,676,113
COMPOSITE SCOTOPHOR-PHOSPHOR CATHODE-RAY TUBE SCREEN
Ernest R. Jervis, Waukegan, Ill., assignor to National Union Radio Corporation, Orange, N. J., a corporation of Delaware
Application April 25, 1952, Serial No. 284,385
3 Claims. (Cl. 117—33.5)



1. A display screen for cathode ray tubes and the like comprising a mixture of scotophor material and fluorescent phosphor material, and a light transparent support to which said mixture is applied.

2,676,154
LUMINESCENT SCREEN COMPOSITION
Charles W. Thierfelder, Muskogee, Okla., assignor to Radio Corporation of America, a corporation of Delaware
Original application December 29, 1949, Serial No. 135,613, now Patent No. 2,654,675, dated October 6, 1953. Divided and this application December 8, 1951, Serial No. 260,597
2 Claims. (Cl. 252—301.6)

1. A phosphor composition comprising a mix-



ture of the following ingredients in percent by weight: about 18.7% to about 28.7% zinc sulfide activated with about 0.01% by weight of silver, about 51.3% to about 61.3% zinc beryllium orthosilicate, activated with manganese, said orthosilicate having the molar formula

$$7.86\ ZnO:BeO:5.28\ SiO_2:0.44\ Mn$$

and about 15% to about 25% calcium magnesium silicate activated with titanium, said silicate having the molar formula $CaO:MgO:2SiO_2$ and being activated with from 1 to 10 mol percent TiO_2.

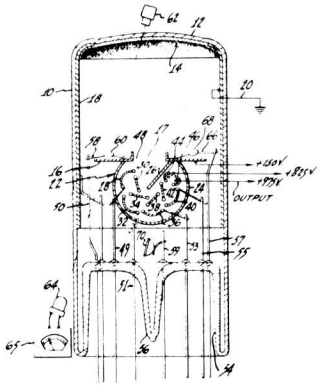
2. A luminescent viewing screen comprising a base having a coating of a phosphor composition comprising a mixture of the following ingredients in percent by weight: about 18.7% to about 28.7% zinc sulfide activated with about 0.01% by weight of silver, about 51.3% to about 61.3% zinc beryllium orthosilicate activated with manganese, said orthosilicate having the molar formula $7.86\ ZnO:BeO:5.28\ SiO_2:0.44\ Mn$, and about 15% to about 25% calcium magnesium silicate activated with titanium, said silicate having the molar formula $CaO:MgO:2SiO_2$ and being activated with from 1 to 10 mol percent TiO_2.

2,676,282

PHOTOCATHODE FOR MULTIPLIER TUBES

Joseph J. Polkosky, Lancaster, Pa., assignor to Radio Corporation of America, a corporation of Delaware

Application April 9, 1951, Serial No. 219,997
4 Claims. (Cl. 313—102)



1. A photosensitive cathode comprising, a transparent support base element, an oxidized manganese film on said base element, a deposit of antimony on said oxidized manganese film, and a deposit of cesium on said antimony film.

2,676,894

METHOD OF COATING WITH FLUORESCENT MATERIAL

James Thomas Anderson and Harold Francis Ward, Rugby, England, assignors to General Electric Company, a corporation of New York

No Drawing. Application February 4, 1949, Serial No. 74,718
Claims priority, application Great Britain April 2, 1948
4 Claims. (Cl. 117—33.5)

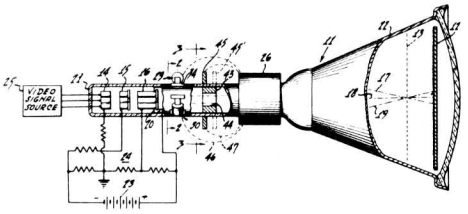
1. The process of coating a vitreous surface with powdered luminescent material which includes the steps of flowing over said surface a suspension of said luminescent material in a water solution of a water-soluble salt of alginic acid capable of giving at least a moderately viscous solution, draining the solution from said surface and drying the resultant coating, and thereafter heating the coating so formed to a temperature at which said water-soluble salt of alginic acid is dispersed.

2,677,779

TRICOLOR KINESCOPE MAGNETIC SHIELD

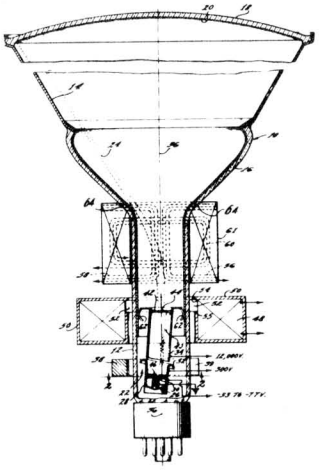
Hunter C. Goodrich, Collingswood, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application May 22, 1953, Serial No. 356,620
7 Claims. (Cl. 313—70)



1. In a cathode ray tube image-reproducing system wherein a plurality of electron beam components, which traverse pre-deflection paths that are spaced respectively about the longitudinal axis of the tube, are angularly deflected both horizontally and vertically by electromagnetic beam deflection apparatus to scan a raster in a predetermined plane, electron beam convergence apparatus comprising, a plurality of electromagnets respectively mounted adjacent to said predeflection beam paths and energizable to produce respective fields transverse to said beam paths, each of said electromagnets having a core including a body portion located externally of said tube and a pair of pole pieces located internally of said tube and respectively extending from points adjacent to opposite ends of said body portion into the region of said associated beam component, and a magnetic shield located between said deflection apparatus and said convergence electromagnets to exclude deflection flux from said electromagnets.

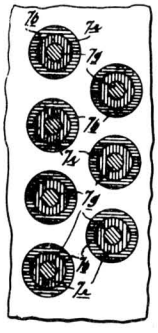
2,680,204
GUN STRUCTURE
Lloyd Edward Swedlund, Lancaster, Pa., assignor to Radio Corporation of America, a corporation of Delaware
Application November 30, 1950, Serial No. 198,261
8 Claims. (Cl. 313—76)



1. An electron discharge device comprising, an electron gun including a source of electrons for producing an electron beam along a path, a target screen mounted transversely to said beam path, and a coil enclosing a part of said electron gun between said electron source and said target screen for producing a focusing field within said coil, said electron gun part including a beam limiting aperture positioned on the axis of said coil, said electron gun source being offset from said coil axis.

23,838
POST-DEFLECTED COLOR KINESCOPE
Jan A. Rajchman, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Original No. 2,619,608, dated November 25, 1952, Serial No. 184,857, September 14, 1950. Application for reissue October 5, 1953, Serial No. 384,366
13 Claims. (Cl. 313—86)

1. A television screen comprising a foundation member having a target surface containing a multiplicity of groups of electron-sensitive areas *each* consisting essentially of a plurality of concentrically disposed electron-sensitive parts.

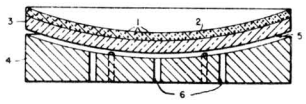


9. A fluorescent screen for use in a cathode ray tube and which is formed of phosphors fluorescing in different colors, when subjected to electron impact, said screen comprising a first phosphor arranged on a supporting plate in a regular pattern of discrete elements individually having a predetermined area and at least one other phosphor having a lower intensity of light-emission upon electron impact than that of said first phosphor and arranged on said plate in a regular pattern of similar discrete elements individually having an area larger than said predetermined area.

2,681,293
MANUFACTURE OF FLUORESCENT SCREENS FOR CATHODE-RAY TUBES
Leslie John Charles Bayford, Cranford, and Peter Seats, Hayes, England, assignors to Electric & Musical Industries Limited, Hayes, Middlesex, England, a company of Great Britain
No Drawing. Application November 21, 1949, Serial No. 128,677
Claims priority, application Great Britain November 24, 1948
8 Claims. (Cl. 117—33.5)

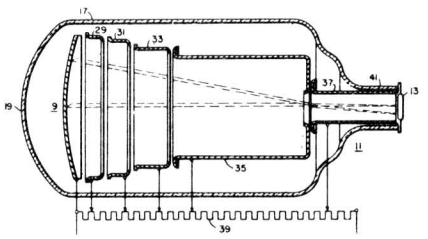
1. A method of making a fluorescent screen. comprising the steps of settling particles of phosphor from a liquid suspension medium on to a support to form a fluorescent layer, retaining at least some of said liquid medium with the settled particles, applying a solution of organic substance in a solvent to the surface of said liquid suspension medium, evaporating said solvent to form a film of said organic substance on said surface of said medium, removing said medium to apply said film to said fluorescent layer, applying a coating of metal to said film, and removing said film to apply said metal coating to said fluorescent layer.

2,681,861
GLASS FOR EMBEDDING ZINC SULFIDE PHOSPHORS
Walter J. Hushley, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application December 12, 1950, Serial No. 200,367
5 Claims. (Cl. 106—54)



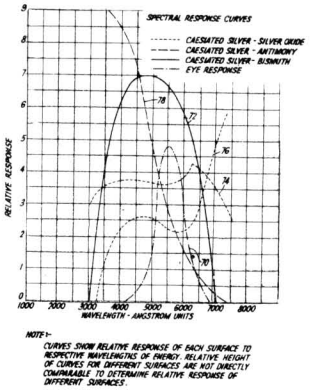
1. A glass which is of a fired reaction product of a mixture which consists essentially of 55% to 80% B_2O_3, 10% to 25% SiO_2, 2% to 12% material drawn from the group consisting of Al_2O_3, and MgO, the MgO being not over 6% of the combined mixture, 5% to 15% of material drawn from the group which consists of Na_2O and NaF and 0% to 25% of GeO_2, all said percentages being by weight.

2,681,868
IMAGE AMPLIFIER
Ruric C. Mason, John W. Coltman, Lloyd P. Hunter, and Richard L. Longini, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application August 10, 1949, Serial No. 109,586
4 Claims. (Cl. 117—33.23)



1. An image amplifier system characterized by an input screen having the property of emitting light in the blue-near-ultra-violet when excited by X-radiation and a photosensitive surface consisting essentially of two alkali metals compounded with at least one element of the group arsenic, antimony, bismuth.

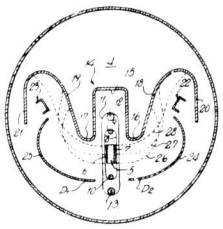
2,682,479
PHOTOSURFACE OF A PANCHROMATIC TYPE AND METHOD OF PREPARING SAME
Ralph Eston Johnson, Lancaster, Pa., assignor to Radio Corporation of America, a corporation of Delaware
Application March 3, 1949, Serial No. 79,328
11 Claims. (Cl. 117—33.23)



1. A photosensitive electrode comprising, a support, a layer of silver-bismuth alloy on the surface of said support, and a deposit of alkali metal on said alloy layer.

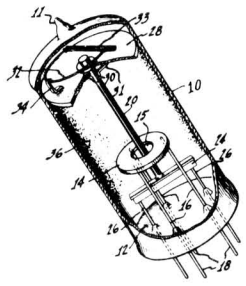
IV-D. Klystrons, Magnetrons, etc.

2,675,431
TRANSIT TIME COMPENSATED MULTIPLIER TUBE
Carl F. Miller, Summit, N. J., assignor to National Union Radio Corporation, Orange, N. J., a corporation of Delaware
Application August 18, 1949, Serial No. 111,023
2 Claims. (Cl. 179—171)



1. An electron tube having a cathode for emitting from opposite sides thereof respective electron beams of a predetermined restricted width, a signal-control grid surrounding the cathode, a dynode having a central reentrant portion and a pair of inclined lateral wing portions diposed on opposite sides of the cathode, said cathode being mounted with certain areas thereof closer to the dynode wings than are other cathode areas, a pair of electron deflector elements located on opposite sides of said cathode each element being closer to said other cathode areas than to the first-mentioned cathode areas said deflector elements being biased negatively with respect to the dynode wings for causing the electrons of the beams to follow curved trajectories to the respective dynode wings with the slower accelerated electrons confined to shorter length paths as compared with the faster accelerated electrons.

2,677,071
VOLTAGE REFERENCE TUBE
Gerald G. Carne, Rockaway, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application June 30, 1948, Serial No. 36,251
8 Claims. (Cl. 313—218)



1. A glow discharge device comprising an en-

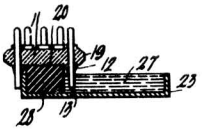
velope having a tubular portion, a gaseous medium within said envelope, a molybdenum plate forming a cathode electrode coaxially mounted within said tubular envelope portion, said cathode plate having an aperture at the center thereof, an anode electrode rod within said tubular envelope portion, said anode rod coaxially extending through the aperture of said cathode plate and spaced therefrom, said cathode electrode being of pure uncontaminated molybdenum to provide a constant work function of said cathode electrode, an aluminum coating on the other side of said cathode plate to inhibit a discharge between said other side of the cathode plate and said anode electrode, and a pure molybdenum coating on the inside surface of said tubular envelope portion in the region of said discharge.

2,678,023

APPARATUS FOR NONUNIFORMLY COATING OBJECTS OF IRREGULAR FORM

William John Bachman, Florham Park, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application December 30, 1950, Serial No. 203,657
3 Claims. (Cl. 118—270)



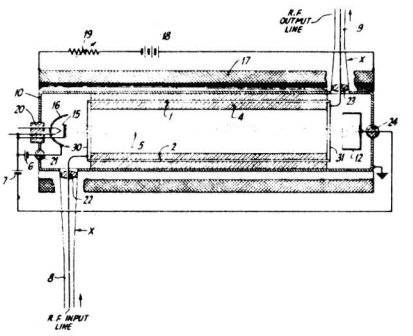
1. Apparatus for coating predetermined portions only of a flat electron tube stem having a central flattened portion and a circular array of fillets and lead-ins around said central portion, for providing an electrostatic shield between certain of said lead-ins, said apparatus comprising a dished receptacle for confining a flowable coating material, said receptacle including two spaced portions and a relatively narrow passageway communicating with said spaced portions, and a deformable pad disposed in one of said portions and extending into said material and having a free side adjacent said passageway, said pad being wetted by said material and having an upper flat surface spaced above the level of said material, said upper flat surface having an area when said pad is uncompressed that is substantially equal to the area of said flattened portion of said stem, said pad widening out at its said free side when compressed for engaging said flattened portion and a side only of a predetermined fillet facing inwardly of said array, said passageway being wide enough to receive only one of said lead-ins, whereby a coating is applied only to said flattened portion, to a side of said predetermined fillet, and to the lead-in extending through said fillet, for providing electrical connection between said coating and said lead-in.

2,679,019

HIGH-FREQUENCY ELECTRON DISCHARGE DEVICE

Nils E. Lindenblad, Port Jefferson, N. Y., assignor to Radio Corporation of America, a corporation of Delaware

Application December 2, 1947, Serial No. 789,273
23 Claims. (Cl. 315—3)



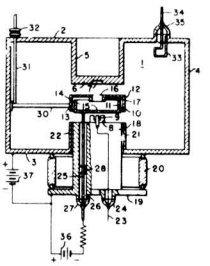
1. An electron discharge device including means for projecting a stream of charged particles, a radio frequency wave carrying element positioned parallel to the path of said stream and adapted to be in energy coupling relation to said stream, said element being embedded in a solid medium having a dielectric constant causing the velocity of the waves traveling along the length of said element to match approximately the velocity of said stream of charged particles, said element being completely surrounded by said medium.

2,679,613

ONE-CAVITY RESNATRON

Max Garbuny, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania

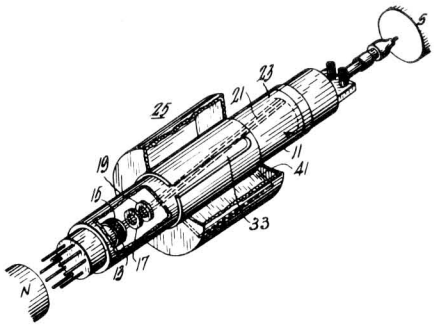
Application August 19, 1950, Serial No. 180,453
3 Claims. (Cl. 315—5)



1. A resnatron comprising a single cavity resonator having cylindrical symmetry, a cathode extending within one end wall of said cavity resonator, an anode comprised of the other end wall of said cavity resonator, a control electrode, said control electrode comprising a disc having an axial aperture and an annular skirt, means mounting said control electrode at a predetermined distance from said cathode, a screen electrode, means movably mounting said screen electrode between said anode and said control electrode, said screen electrode comprising a disc having an axial aperture and an annular skirt overlapping said first mentioned annular skirt and insulated therefrom, said cathode, anode and apertures being aligned with the axis of symmetry of said single cavity resonator, said cathode control electrode, screen electrode and anode being mutually insulated from one another for direct-current voltages.

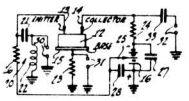
2,682,622
CAVITY RESONATOR FOR MICROWAVE ELECTRON BEAM TUBES
Leon S. Nergaard, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application December 1, 1948, Serial No. 62,804
21 Claims. (Cl. 315—5)

17. In combination: a cavity resonator comprising elongated inner and outer conducting walls defining inner and outer tubular resonator spaces, said inner wall having two longitudinal slots on opposite sides thereof dividing said inner space wall into two opposed deflecting electrodes, and a pair of apertured conducting closure members each electrically connected to one end of said outer wall and to the adjacent ends of said deflecting electrodes for electrically closing the ends of said outer space; and an electron beam tube extending through the apertures in said closure members and comprising means for supplying and directing a beam of electrons longitudinally through said inner resonator space and between said deflecting electrodes, and means for collecting said beam.



SECTION V. TRANSISTORS AND TRANSISTOR CIRCUITS

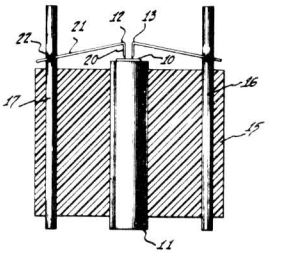
2,675,474
TWO-TERMINAL SINE WAVE OSCILLATOR
Everett Eberhard, Haddonfield, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application May 14, 1949, Serial No. 93,303
10 Claims. (Ci. 250—36)



1. A sine wave oscillator comprising a semiconducting body, a base electrode, an emitter electrode and a collector electrode contacting said body, means for applying a reverse bias between said collector and base electrodes and for applying a predetermined bias between said emitter and base electrodes, an impedance element connected between said base electrode and a point of substantially fixed potential, a resistor connected between said emitter electrode and a point of substantially fixed potential, a series-resonant circuit connected directly across said resistor, and means for deriving a sinusoidal output wave across the inductance element of said circuit.

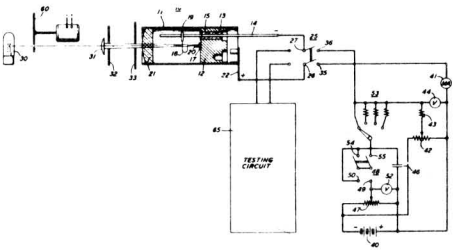
2,675,509
HIGH-FREQUENCY RESPONSE SEMICONDUCTOR DEVICE
Loy E. Barton, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application July 26, 1949, Serial No. 106,926
1 Claim. (Cl. 317—235)

A high frequency transistor comprising a semiconducting body having two plane surfaces substantially parallel to each other, two rectifying point electrodes in contact with one of said surfaces, said point electrodes being spaced approximately one mil apart, and a large area electrode in low resistance contact with the other of said surfaces, the thickness of said body between said surfaces being between approximately



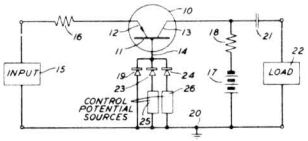
5 mils and approximately 1 mil, thereby to provide a device having a large heat dissipation and a high frequency response.

2,676,228
CONDITIONING OF SEMICONDUCTOR TRANSLATORS
John N. Shive, Plainfield, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York
Application October 6, 1951, Serial No. 250,159
7 Claims. (Cl. 201—63)



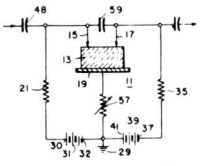
1. The method of permanently altering the electrical characteristics of a light responsive translator having a semiconductor body of one conductivity type and a base and a restricted area, metallic collector connection having an asymmetric conduction characteristic, which comprises liberating minority charge carriers in the body in the vicinity of the collector connection by applying light to that region simultaneously with the application of electrical forming energy to the collector connection.

2,676,271
TRANSISTOR GATE
Edwin G. Baldwin, East Orange, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York
Application January 25, 1952, Serial No. 268,218
8 Claims. (Cl. 307—88)



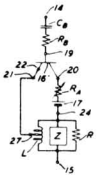
1. An electronic gate comprising a translating device, said translating device comprising a body of semiconductive material having an emitter electrode, a collector electrode and base electrode means including a first asymmetrically conducting impedance element, a direct-current path including a source of potential, said collector electrode and said base electrode means, and means for controllably biasing said first asymmetrical element comprising a second asymmetrically conducting impedance element coupled to said first asymmetrical element and means for applying control potentials to said second asymmetrical impedance element.

2,679,594
WAVE GENERATOR
Kenneth N. Fromm, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania
Application February 28, 1950, Serial No. 146,715
3 Claims. (Cl. 250—36)



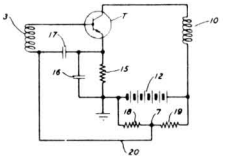
3. A pulse generator comprising a transistor having emitter, collector, and base electrodes, an external network interconnecting said electrodes, said network including a first path extending from the collector electrode to the emitter electrode by way of which collector output power is fed back to the emitter, and a second path common to the emitter and collector electrode circuits by way of which collector output power is fed back to the emitter, said first path comprising a capacitor connected between said collector and emitter electrodes, and said second path comprising a feedback resistor connected between said base electrode and a terminal which is common to the emitter and collector electrode circuits.

2,679,633
WAVE TRANSMISSION NETWORK UTILIZING IMPEDANCE INVERSION
John T. Bangert, Summit, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York
Application October 22, 1952, Serial No. 316,298
30 Claims. (Cl. 333—80)



1. A network comprising two terminals, a transistor having a base, a collector, and an emitter, a resistor connected between one of said terminals and said base, an electrical path between said collector and the other of said terminals, said path including a source of voltage in series with the parallel combination of a second resistor and an inductor, and a feedback path between said emitter and a tapping point on said inductor.

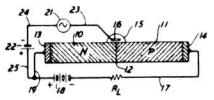
2,680,160
BIAS CIRCUIT FOR TRANSISTOR AMPLIFIERS
Robert E. Yaeger, Califon, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York
Application September 15, 1951, Serial No. 246,823
3 Claims. (Cl. 179—171)



1. A biasing circuit for a transistor having a body of semiconductive material and base, emitter, and collector terminal connections made thereto, said transistor characterized by a current gain factor which is slightly less than unity, said circuit comprising a single prime source of substantially constant direct-current biasing voltage, a potentiometer resistance connected across said prime source and having a magnitude to draw a current from said source which is so large relative to current in said base as to make biasing potentials applied to said base substantially independent of variations in said base current, said source and said potentiometer resistance comprising means for biasing said collector with respect to ground, means comprising a portion of said potentiometer resistance for biasing said base with respect to ground, an input coupling for signal waves included between the base and ground, an output coupling to the collector for signal waves, said emitter being grounded for signal frequency waves, and a resistor connected

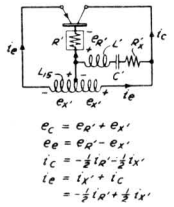
between said emitter and ground of sufficiently high value to hold the emitter direct current substantially constant in the presence of collector current variations that are slow in comparison with the lowest signal frequency.

2,681,993
CIRCUIT ELEMENT UTILIZING SEMICONDUCTIVE MATERIALS
William Shockley, Madison, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York
Original application June 26, 1948, Serial No. 35,423. Divided and this application May 5, 1949, Serial No. 91,594
8 Claims. (Cl. 250—36)



7. A signal translating device comprising a body of semiconductive material having a first and a third zone of one conductivity type and a second zone of the opposite conductivity type intermediate and contiguous with said first and third zones, an input circuit connected to said first and second zones, a feedback coupling between said third zone and said input circuit, and means for deriving an output from said device.

2,681,996
TRANSISTOR OSCILLATOR
Robert L. Wallace, Jr., Plainfield, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York
Application September 12, 1950, Serial No. 184,459
6 Claims. (Cl. 250—36)

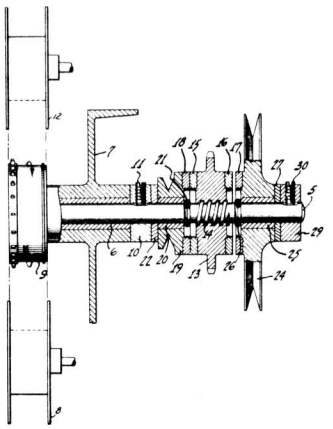


1. A stabilized transistor oscillator circuit which comprises a transistor having a base electrode, an emitter electrode and a collector electrode, an inductance winding having two end terminals and an intermediate tap and being characterized by substantially unity coupling between the two parts defined by said tap, one of said end terminals being connected to said emitter electrode, the other of said end terminals being connected to said collector electrode, a nonlinear resistance element having a negative temperature coefficient interconnecting the base electrode of said transistor with said tap, and a series tuned resonant circuit shunting at least a portion of said winding.

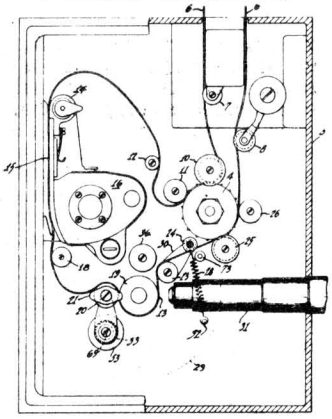
SECTION VI. SOUND AND SOUND-PICTURE RECORDING AND REPRODUCING APPARATUS

2,675,974
FILM TAKE-UP AND REWIND DRIVE MECHANISM
Alan S. Jones, Palmyra, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application August 31, 1950, Serial No. 182,479
5 Claims. (Cl. 242—55)

1. A drive mechanism for a film advancing sprocket, a take-up reel, and a supply reel comprising a shaft, a film advancing sprocket mounted at one end of said shaft, a constant speed drive sprocket for said shaft mounted thereon, said drive sprocket being threaded on said shaft so that rotation in one direction advances said drive sprocket axially along said shaft, and rotation of said drive sprocket in the opposite direction moves said drive sprocket axially along said shaft in the opposite direction, a first pulley having a certain diameter on one side of said drive sprocket for driving said take-up reel, a second pulley having a larger diameter than said first pulley and positioned on the other side of said drive sprocket, and contact means between said drive sprocket and said pulleys, rotation of said drive sprocket in one direction driving said first pulley and take-up reel to take up film at one certain speed and rotation of said drive sprocket in the other direction driving the other of said pulleys to take up film by said supply reel at a higher rate of speed determined by the differential in size between said pulleys.

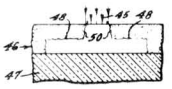


2,676,023
SOUND RECORDING CAMERA
Warren R. Isom, West Collingswood, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application October 29, 1948, Serial No. 124,397
2 Claims. (Cl. 274—4)



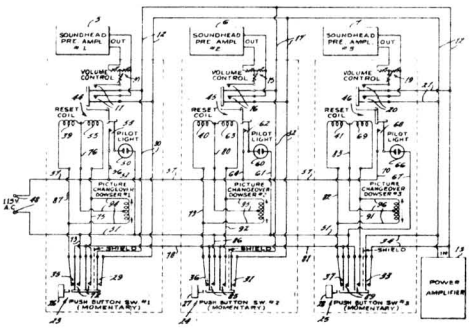
1. In a camera recorder for recording both magnetic and photographic sound tracks in a film having a photographic emulsion on one side thereof and a magnetic sound track medium on the other side thereof, the combination of a casing; a film pulled drum mounted in said casing; a sound light objective tube and a magnetic sound head mounted in said casing and disposed around said drum in spaced relationship from each other and from said drum; a pressure roller; the said roller being mounted on the end of a spring biased bracket pivoted at its other end to said casing at a point laterally spaced from said drum, whereby when said film is threaded over and partially around said drum with the magnetic medium in contact with said head, the said roller may be swung against the film to hold the same on the drum for magnetic recording and whereby when the film is threaded around the drum between the said tube and drum and out of contact with said head, the said roller may be swung against that portion of the film contacting that side of the drum opposite said tube for holding the film on the drum for sound light recording.

2,676,101
METHOD OF REVERSAL PROCESSING SOUND TRACKS
Alfred R. Ulmer, Dumont, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application December 21, 1950, Serial No. 202,097
1 Claim. (Cl. 95—5)



The method of producing a photographic sound track by the reversal process comprising exposing a photographic emulsion through the base supporting said emulsion to a degree wherein approximately one-half the depth of said emulsion next to said base becomes developable, then directly exposing said emulsion to light modulated by sound, said light being of an intensity such as to just render developable the remaining half depth of said emulsion, then developing said emulsion to change the exposed emulsion to metallic silver, then removing said silver, then uniformly again exposing said emulsion to render the remainder of the emulsion developable and again developing said emulsion to change said last exposed emulsion to metallic silver.

2,676,272
SOUND AND PICTURE CHANGEOVER SYSTEM
John F. Byrd, Ashland, and James D. Phyfe, Moorestown, N. J., assignors to Radio Corporation of America, a corporation of Delaware
Application June 10, 1952, Serial No. 292,761
10 Claims. (Cl. 307—113)

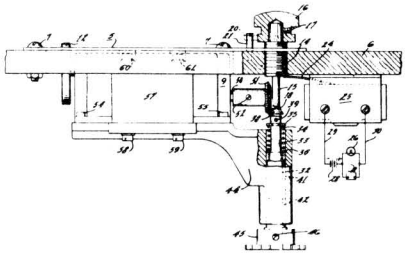


1. A changeover system comprising a plurality of sound current generators, an amplifier connectable to the outputs of all of said generators, electrically operative switches each having a pair of windings and a plurality of contacts for connecting and disconnecting the outputs of said generators to and from said amplifier, a power supply, a manually operative switch at each of said generators, and circuit means interconnecting said electrically operative switches, said power supply, and said manually operative switches, each of said manually operative switches having a pair of normally open contacts which are first closed for short-circuiting the input of said amplifier, a pair of normally closed contacts which are then opened to prevent the connecting of one of said windings of said electrically operative switch to said power supply, and a plurality of contacts which are then made for connecting said power supply to the other winding of said electrically operative switch associated with said manually operative switch and one of the windings of each of said other electrically operative switches.

2,676,754
COUNTER GEAR SYSTEM
Carl E. Hittle, North Hollywood, Calif., assignor to Radio Corporation of America, a corporation of Delaware
Application November 29, 1952, Serial No. 323,224
6 Claims. (Cl. 235—91)

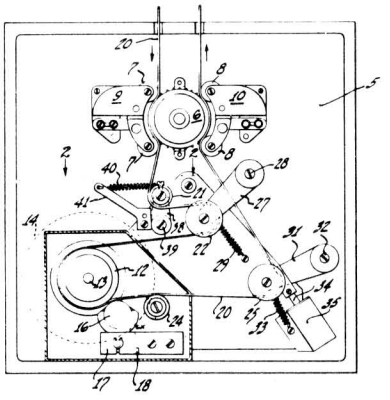
1. A footage counter drive for a film advancing mechanism comprising a shaft driven from said mechanism, a gear mounted on said shaft,

said shaft and gear being rotatable and movable axially, a coil spring surrounding said shaft and urging said shaft and gear in one axial direction, a gear normally in mesh with said first mentioned gear, said spring urging said gears in mesh, a footage counter driven by said second mentioned gear, an adjustable shaft in axial alignment and in contact with one end of said first mentioned gear shaft, means for rotating said adjustable shaft between predetermined limits, rotation of



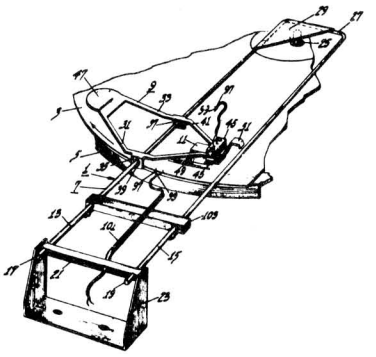
said adjustable shaft moving said adjustable and said first mentioned gear shaft axially against the tension of said spring to disconnect said gears.

2,676,798
FILM DRIVE FILTER
Arthur C. Blaney, Los Angeles, and James L. Pettus, Encino, Calif., assignors to Radio Corporation of America, a corporation of Delaware
Application April 20, 1950, Serial No. 157,084
3 Claims. (Cl. 271—2.3)



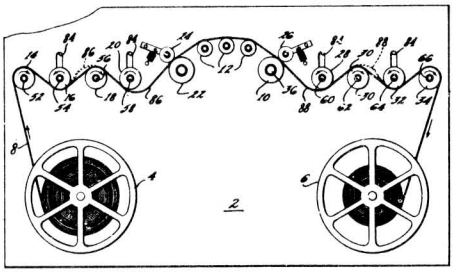
1. A film drive comprising a sprocket adapted to advance film at two positions thereon, a film-pulled drum, said film forming two tight loops between said drum and said sprocket, a plurality of rollers tensioned against said film in said loops, two tensioning rollers being in a first one of said loops and one tensioning roller being in the other of said loops, and means for pivoting said two rollers so that said two rollers move substantially toward and away from one another during variations in size of said film loop in which they are positioned, the roller adjacent said sprocket being lighter in weight and under less tension than the other of said two rollers.

2,676,808
SLIDING CARRIAGE PICKUP ASSEMBLY
Earl E. Masterson, Palmyra, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application December 31, 1948, Serial No. 68,616
8 Claims. (Cl. 274—23)



1. A phonograph pick-up assembly for use in connection with a phonograph record having a sound groove, said assembly comprising a carriage in the form of a lever, a pick-up having a stylus carried by said carriage and disposed intermediate the ends of said carriage, the tip of said stylus comprising the fulcrum of said lever and being adapted to travel in said record sound groove, means disposed at each end of said carriage for counterbalancing said carriage on said stylus tip, said counterbalancing means at one end of said carriage comprising said pick-up, and guide means intermediate the ends of said carriage for guiding said stylus in a radial direction across said record.

2,678,820
REELING SYSTEM
Earl E. Masterson, Palmyra, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application October 30, 1951, Serial No. 253,888
7 Claims. (Cl. 271—2.3)



1. In a tape reeling system for reeling a flexible tape from a supply reel to a take-up reel, a capstan for driving the tape, means for driving said capstan at a predetermined constant speed, a plurality of feed rollers sequentially positioned between said capstan and the supply reel, means for driving said feed rollers at a tangential velocity greater than that of said capstan, alternate ones of said feed rollers being driven in opposite directions, and means intermediate said capstan and said feed rollers for applying a substantially constant drag on the tape, said feed

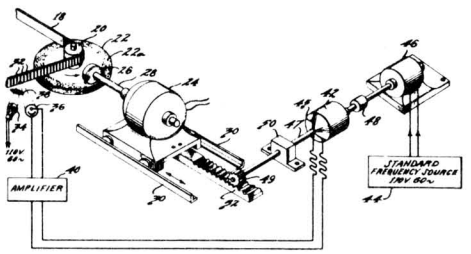
rollers defining a serpentine path for the tape which lies on opposite sides of alternate ones of said rollers.

2,678,821

SYNCHRONOUS DRIVE APPARATUS

Earl E. Masterson, Palmyra, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application April 29, 1948, Serial No. 23,884
2 Claims. (Cl. 271—2.6)



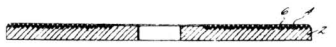
1. In apparatus for synchronizing the velocity of a recording medium with a standard frequency source wherein the medium bears a series of regularly spaced signal producing marks, the signals produced from said marks being compared in frequency with signals from the standard source to produce a control for the velocity of said medium, a frequency comparing means comprising a first synchronous motor having a shaft and an outer casing, a second synchronous motor having a shaft and an outer casing, the shafts of said first and second motors being directly coupled together for simultaneous rotation, the outer casing of said first motor being fixedly mounted, the outer casing of said second motor being rotatably mounted, means for energizing one of said motors from the signals produced from said marks and means for energizing the other of said motors from the signals of said standard source, asynchronism of said signals resulting in a rotation of the outer casing of said second motor.

2,678,895

COMPRESSED METAL POWDER PHONOGRAPH RECORDS AND METHODS OF MAKING SAME

Herbert Belar, Burlington, and John Preston, Metedeconk, N. J., assignors to Radio Corporation of America, a corporation of Delaware

Application January 25, 1950, Serial No. 140,438
17 Claims. (Cl. 154—110)



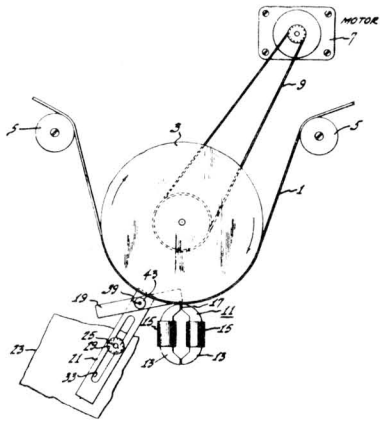
1. A sound record comprising a tablet of compressed powder of a single metal from the class consisting of zinc and tin and having a sound track embossed on at least one surface thereof.

2,678,970

DEVICE FOR CONTROLLING A STRAY MAGNETIC FLUX IN MAGNETIC SOUND TRANSLATING DEVICES

Benjamin S. Vilkomerson, Camden, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application May 28, 1949, Serial No. 96,094
3 Claims. (Cl. 179—100.2)



1. In a magnetic sound translating device, the combination with a magnetic head the operation of which may be adversely affected by the presence of a stray alternating magnetic field adjacent to said magnetic head, of a body of magnetic material, means for adjustably mounting said body adjacent to and spaced from said magnetic head, said body being movable toward and away from said magnetic head in all directions in a plane intercepting said stray field, said body being orientable within said stray magnetic field so as to be responsive to divert a portion of the magnetic lines of flux in said magnetic stray field from said magnetic head and to set up an opposing alternating magnetic field which will induce an alternating voltage in said magnetic head to oppose and effectively cancel any voltages induced directly therein by the flux lines of the remainder of said stray magnetic field, said translating device having a reference base, said mounting means comprising a slotted arm supported on said reference base for longitudinal and pivotal adjustment about a point within the slot, and a substantially rectangular bar of material having a high magnetic permeability pivotally supported adjacent to one end of said slotted arm.

2,679,187

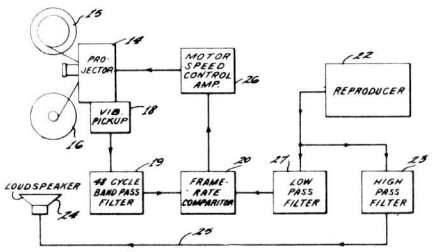
SYNCHRONIZATION OF SEPARATE PICTURE AND SOUND FILMS

Robert C. Bitting, Jr., Pennsauken, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application January 16, 1951, Serial No. 206,259
10 Claims. (Cl. 88—16.2)

4. In a motion picture system having a camera, a sound recorder for recording concomitant

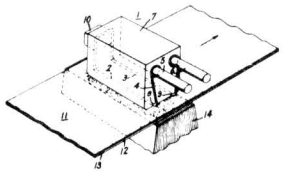
sound for pictures taken by said camera, a projector for said picture, and a sound reproducer for said recorded sound; means for reproducing said recorded sound in true synchronism with the projection of said pictures comprising a vibration pickup mechanism adapted to be mechanically attached to a camera at a point where vibrations are produced by said camera at a frequency which varies in accordance with the speed of the film passing through said camera, said vibration pickup mechanism generating electrical signal pulses from said vibrations, means connecting said vibration pickup mechanism and said sound recorder for recording said electrical signal pulses simultaneously with the recording of said sound, means for attaching said vibration pickup mechanism to a projector at a point where vibrations are produced by said projector at a frequency which varies in accordance with



the speed of the film passing through said projector, whereby comparative electrical pulses are produced, means reproducing electrical pulses from said recorded pulses, means for comparing the phase of said comparative electrical pulses and said reproduced electrical pulses so that an electrical control signal is produced, and means actuated by said control signal to maintain said reproduced sound and motion picture in synchronism.

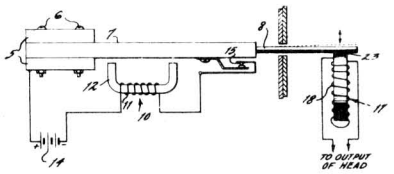
2,680,156
MAGNETIC HEAD FOR PERPENDICULAR RECORDING
Ragnar Thorensen, Baldwinsville, N. Y., assignor to General Electric Company, a corporation of New York
Application June 9, 1951, Serial No. 230,775
8 Claims. (Cl. 179—100.2)

1. A magnetic head for perpendicular magnetic recording and reproducing, comprising a pair



of conductor portions connected serially and spaced in parallel relation to each other and to the active surface of a magnetizable medium, said portions defining a plane parallel to the plane of said active surface, and two terminals for the series circuit formed by said conductor portions to receive magnetizing signal current, whereby said current flows in opposite directions in said conductor portions and the magnetic fields produced around each of said conductor portions jointly affect said medium and augment each other in the space between said conductor portions.

2,681,387
MAGNETIC RECORD REPRODUCING SYSTEM
Henry E. Roys, Haddon Heights, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application February 10, 1950, Serial No. 143,385
7 Claims. (Cl. 179—100.2)

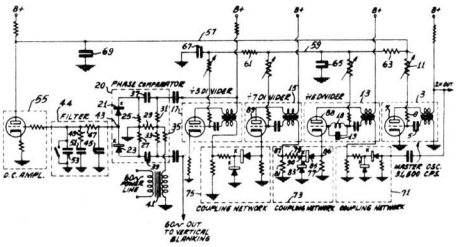


1. In a telegraphone, the combination of a magnetic record, a magnetic transducer having stationary polar extremities defining the fixed boundaries of a non-magnetic gap disposed adjacent to the path of movement of said magnetic record, and means including a vibratile element mounted adjacent to and within the flux field of said gap of said transducer produced by said record and in a position to impart vibrations to said record during its movement along that portion of said path adjacent to and within the flux field of said gap produced by said record to induce in said transducer a carrier current for said record.

SECTION VII. MEASURING AND TESTING APPARATUS

2,677,059
SIGNAL GENERATOR
Winthrop S. Pike, Princeton, and Jeremiah M. Morgan, Cranbury, N. J., assignors to Radio Corporation of America, a corporation of Delaware
Application March 6, 1951, Serial No. 214,062
4 Claims. (Cl. 250—36)

1. A signal generator comprising a master blocking oscillator to generate oscillations occurring at a given frequency, said master blocking oscillator comprising an electron discharge tube having a control electrode, at least one fre-



quency divider comprising a blocking oscillator connected to said master oscillator to derive an indicating signal from said master oscillator such that said indicating signal bears a fixed timing relationship to said master oscillator frequency, said frequency divider comprising an electron discharge tube having a control electrode, standardizing signal terminals for receiving a standardizing signal of predetermined frequency, a frequency comparator circuit connected to receive both said indicating signal and said standardizing signal and adapted to develop a control potential as a function of the phase difference between said indicating signal and said standardizing signal, and means for applying said comparator circuit control potential to the control electrode of said master oscillator electron discharge tube and to the control electrode of said frequency divider electron discharge tube with such electrical polarity as to stabilize the frequencies of said master oscillator and of said frequency divider in accordance with said standardizing signal.

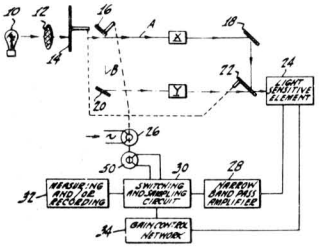
2,678,581

SIGNAL COMPARISON APPARATUS

John H. Reisner, Haddonfield, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application November 30, 1949, Serial No. 130,139

3 Claims. (Cl. 88—14)



1. An apparatus for comparing light values received from two samples to be compared, said apparatus comprising a source of light, means to derive from said source a pulsating beam of light, means to project said beam upon said samples alternately at a rate lower than the rate of pulsation of said beam whereby to modify said pulses in alternate groups in accordance with a physical characteristic of said samples, an electric circuit including a light sensitive element arranged to be actuated by modified light pulses received from said samples to generate groups of electrical pulses proportional in amplitude to the amplitudes of said modified light pulses, an amplifier in said circuit for amplifying said electrical pulses, said amplifier including a coupling circuit having a narrow frequency pass band with a center frequency equal to the pulse repetition rate of said electrical pulses, means to derive from selected portions of said electrical pulse groups two separate voltages proportional in magnitude to the amplitude of the amplified pulses in alternate ones of said groups, a response control circuit for controlling the response of said electric circuit to said pulses in accordance with one of said voltages during derivation of the other of said voltages, and means to measure said other voltage as a measure of the comprative magnitudes of said modified pulses.

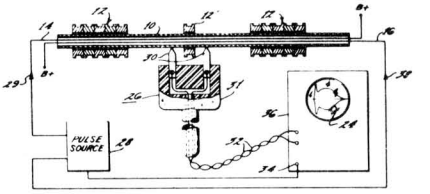
2,679,025

MAGNETIC TESTING SYSTEM

Jan A. Rajchman, Princeton, and Milton Rosenberg, Trenton, N. J., assignors to Radio Corporation of America, a corporation of Delaware

Application May 28, 1952, Serial No. 290,388

15 Claims. (Cl. 324—34)



1. A device for testing the characteristics of magnetic cores comprising a non-magnetic hollow tube having a longitudinally disposed electrically conductive portion, said tube being adapted to have mounted thereon magnetic cores to be tested, a wire threaded through said tube, means for applying a current pulse to said wire, a probe, said probe including an open coil having two spaced conducting endings adapted to contact said electrically conducting portion on either side of a core, said open coil forming with said portion a one turn coil closed through said core under test, and means coupled to said coil to display voltages induced in said coil.

2,681,437

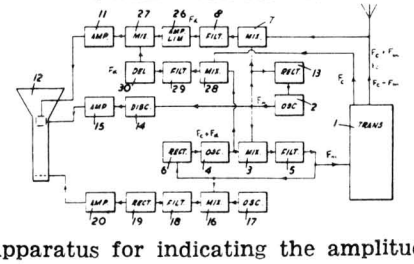
APPARATUS FOR INDICATING THE AMPLITUDE OR PHASE VERSUS FREQUENCY CHARACTERISTIC OF AN ELECTRICAL CIRCUIT

Eric McPhail Leyton, London, England, assignor to Electric & Musical Industries Limited, Hayes, England, a British company

Application March 27, 1951, Serial No. 217,706

Claims priority, application Great Britain April 1, 1950

4 Claims. (Cl. 332—39)



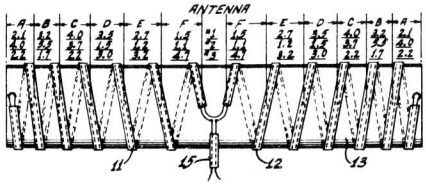
1. Apparatus for indicating the amplitude or

phase-versus-frequency characteristic of a radio frequency circuit, comprising means for feeding to said circuit first oscillations, means for generating second oscillations of a continuously variable frequency, means for amplitude modulating said first oscillations by said second oscillations, mixing means, means for generating third oscillations of a variable frequency having the same frequency difference from the lower sideband and the upper sideband respectively of the modulated first oscillations during alternate cycles of variation of said second oscillations, means for feeding said modulated oscillations and said third oscillations to said mixing means to obtain beat frequency oscillations, filter means for selecting beat frequency oscillations of a predetermined frequency from said mixing means, a cathode ray tube, and means for deflecting the beam of said tube along one axis in accordance with the frequency of said third oscillations and along a second axis in accordance with signals derived from said beat frequency oscillations.

SECTION VIII. ANTENNAS

2,682,608
INDOOR TELEVISION ANTENNA
Ernest O'Easten Johnson, Haddonfield, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application March 16, 1950, Serial No. 149,975
6 Claims. (Cl. 250—33)

1. An antenna including a pair of elongated conductors substantially equidistantly spaced from each other throughout their entire length with the ends of said conductors connected together, one of said conductors having a discontinuity therein at substantially the center thereof, and means to couple transducer apparatus

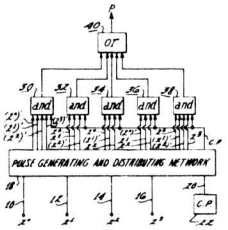


across said discontinuity, said conductors being wound in helical formation in opposing directions on each side of said discontinuity, the spacing between adjacent turns of said conductors increasing from turn to turn toward the center of said conductors.

SECTON IX. COMPUTERS AND COUNTERS

2,674,727
PARITY GENERATOR
Arnold Spielberg, Camden, N. J., assignor to Radio Corporation of America, a corporation of Delaware
Application October 14, 1952, Serial No. 314,626
8 Claims. (Cl. 340—149)

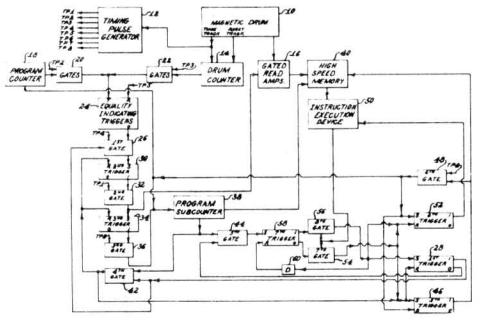
1. In apparatus for selectively generating a parity pulse for a number represented in a binary code, the combination of a plurality of parallel



signal input channels each of which corresponds to a different one of the binary digits of said number, means to apply electrical signals to said signal input channels to establish them in conditions representative of said number, means responsive to each of said signals on said signal input channels to generate phase and paraphase voltages, a single signal output channel, a plurality of gate circuit means connected to said signal output channel, said plurality of gate circuit means being responsive to various predetermined combinations of said phase and paraphase voltages to produce a parity signal on said signal output channel, and distribution network means to distribute said phase and paraphase voltages in said predetermined combinations to said plurality of gate circuit means to operate said gate circuit means to provide a parity signal in said signal output channel.

2,679,638
COMPUTER SYSTEM
Lowell S. Bensky and Arthur D. Beard, Haddonfield, N. J., assignors to Radio Corporation of America, a corporation of Delaware
Application November 26, 1952, Serial No. 322,762
7 Claims. (Cl. 340—174)

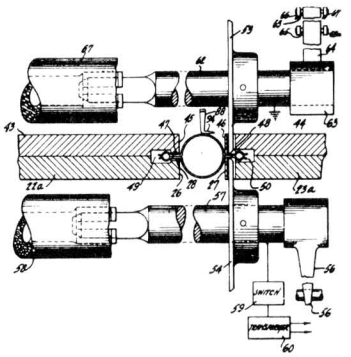
1. A system for surging into a high speed storage, for demand use by an instruction execution



device, a desired group of instructions, out of a cyclically operating storage device wherein the instructions are stored as lines, each line having associated therewith a counting pulse, said system comprising means to establish the count of the first line of said desired group of instructions, means to count said associated counting pulses on said cyclically operating storage device, means to compare the count of said associated counting pulses with the count of said desired group established in said establishing means, means responsive to the occurrence of a coincidence in said counts to permit transfer of the lines of data corresponding to said desired group of instructions into said high speed storage and instruction execution device, means to establish the location of each of said group of instructions in said high speed storage and the sequence of read out into said instruction execution device of said instructions from said high speed storage, and means responsive to the execution of an instruction by said instruction execution device to actuate said high speed memory to provide the next one of said desired group of instructions required.

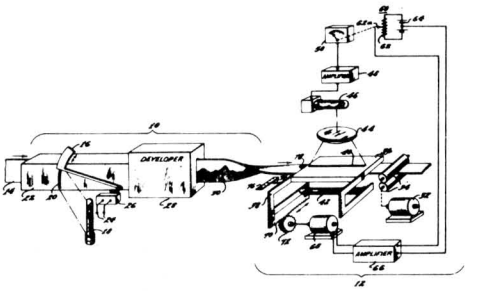
SECTION X. MISCELLANEOUS APPARATUS

2,674,679
AUTOMATIC ASSEMBLING AND WELDING APPARATUS
Hershey Roy Graybill, Manheim, Pa., assignor to Radio Corporation of America, a corporation of Delaware
Application February 25, 1952, Serial No. 273,217
22 Claims. (Cl. 219—6)



15. An assembling and welding apparatus comprising a loading means, a guiding means in registry with said loading means and adjacent thereto, welding means in said guiding means, and movable means movable through said loading means and guiding means and adapted to move work pieces to be welded from said loading means and to said welding means, said movable means being mounted for movement in a path including a portion of said welding means for stopping a welding operation.

2,674,916
VARIABLE QUANTITY EVALUATOR HAVING LIGHT SENSING MEANS
Frederick W. Smith, Jamaica, N. Y., assignor to Radio Corporation of America, a corporation of Delaware
Application July 26, 1950, Serial No. 175,893
2 Claims. (Cl. 88—14)



1. Apparatus for evaluating a variable quantity recorded on an elongated transparency as an opaque strip extending from one edge of said transparency, said strip varying in width as a function of variations in said quantity, said apparatus comprising a carriage, a plate mounted on said carriage and formed with an elongated slit therein, a source of light mounted on said carriage beneath said slit, means to move said transparency through said carriage between said light source and said plate in a direction parallel to the longitudinal axis of said slit, a light sensitive element disposed above said plate and positioned to receive light from said source passing through said transparency and said slit, means coupled to said light sensitive element to generate a con-

trol votlage of one polarity when the amount of light received by said element is greater than a predetermined amount, and a control voltage of an opposite polarity when the amount of light received by said element is less than said predetermined amount, means including a reversible motor mechanically coupled to said carriage and electrically coupled to said control voltage generating means to move said carriage transversely across said transparency in response to said control voltages, said predetermined amount of light having an intensity determined by the light transmitted through said slit and by the portions of the transparency directly beneath said slit unobstructed by said opaque strip.

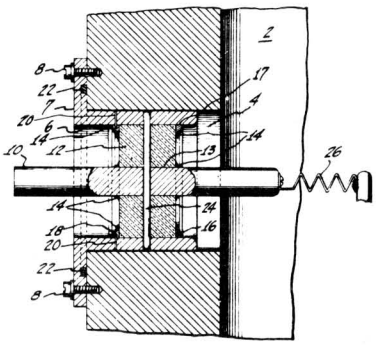
2,676,198

ELECTRICAL CONNECTOR

Robert G. Picard, Collingswood, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application August 31, 1950, Serial No. 182,475

2 Claims. (Cl. 174—152)



1. An assembly for feeding high power, high frequency electrical energy through an aperture in the wall of a vacuum chamber comprising a pair of coaxial conductors disposed within said aperture, the outer conductor of said coaxial pair being secured to said wall, a polytetrofluorethylene insulating washer, the inner conductor of said coaxial pair supported within said outer conductor by said insulating washer, said washer having an inner and outer diameter capable of providing a fairly snug fit between said coaxial conductors, said fit having a clearance capable of leaking air, a sealing substance having a low vapor pressure and having the ability to wet said coaxial conductors and said insulating washer, said sealing substance being disposed about fitted portions of said washer and said inner conductor for providing therebetween a vacuum-tight seal, and retaining means for said washer, said retaining means being disposed to hold said washer in a predetermined position with respect to said outer conductor.

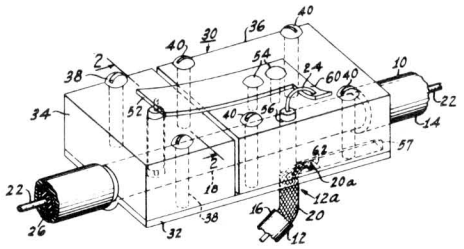
2,677,108

BRIDGING CONNECTION BETWEEN A BRANCH CABLE AND AN UNBROKEN COAXIAL CABLE

Bernard L. Brady, Gibbsboro, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application March 22, 1950, Serial No. 151,270

2 Claims. (Cl. 333—6)



1. A connector for a main and a branch cable each having an inner and an outer conductor, comprising a metallic strap to receive a portion of said main cable with the outer conductor thereof in contact with said strap, a first block for clamping said main cable between said block and said strap, said first block having an aperture to register with an aperture in the outer conductor of said line portion, a second dielectric block to clamp a portion of said branch cable outer conductor between said second block and said strap and also to clamp said main cable, a contact unit including spring means secured to said second block element to be connected to the inner conductor of said branch cable, and means to contact through said apertures said cable portion inner conductor and held in contact by said spring means, thereby to make electrical connection between said inner conductors.

2,678,876

CONDITIONING OF METAL SURFACES

Don G. Burnside, Princeton, N. J., assignor to Radio Corporation of America, a corporation of Delaware

No Drawing. Application December 26, 1950, Serial No. 202,827

6 Claims. (Cl. 41—42)

1. In a method of imparting a mat finish to a polished surface of a metal of the class consisting of copper and brass, the steps of treating said surface with a solution consisting essentially of water, about 10–40% by weight of ammonium persulfate, and about 0.3 to about 1.5% by volume of hydrogen peroxide, and continuing said treatment until said mat finish has been formed.

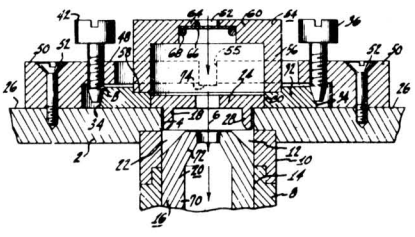
2,679,018

MAGNETIC ELECTRON LENS POLE PIECE

John H. Reisner, Haddonfield, and Perry C. Smith, Moorestown, N. J., assignors to Radio Corporation of America, a corporation of Delaware

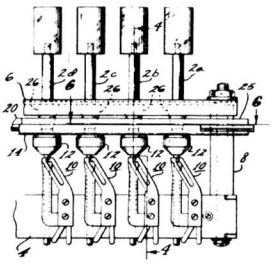
Application June 30, 1950, Serial No. 171,456

7 Claims. (Cl. 313—84)



3. In an electron optical apparatus, a lens spool, a magnetic lens pole piece assembly mounted on said spool, said pole piece assembly including a pair of pole piece elements spaced to provide an air gap, and means for effecting transverse displacements of at least one of said elements with respect to the longitudinal axis of said spool.

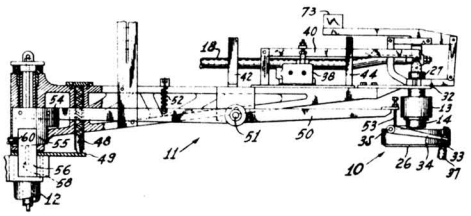
2,680,382
SWITCHING MECHANISM
Robert H. Peterson, Woodbury Heights, and Theodore E. Rolf, Collingswood, N. J., assignors to Radio Corporation of America, a corporation of Delaware
Application December 30, 1950, Serial No. 203,644
9 Claims. (Cl. 74—483)



1. An electric circuit switching mechanism comprising a plurality of depressible contact operating plungers, means for locking said plungers in their depressed position, said means including a first latch plate and a second latch plate, said latch plates lying in a common plane and having complementary apertures, said apertures being normally biased into misalignment, cam means associated with each of said plungers for aligning at least one of said apertures in one of said latch plates with the complementary aperture in the other of said latch plates when one of said plungers is depressed, said latch plates being cooperatively engaged with said cam means to lock said plungers in their depressed position, and a release plunger having a cam means associated therewith which, upon operation of said release plunger, effects an alignment of all of said apertures whereby any contact operating plunger previously locked in its depressed position is released.

2,680,527
AUTOMATIC TRANSFER MECHANISM
John L. Folly, West Hempfield Township, Lancaster County, Pa., assignor to Radio Corporation of America, a corporation of Delaware
Application August 14, 1950, Serial No. 179,187
10 Claims. (Cl. 214—1)

1. An automatic mechanism for transferring objects, comprising an arm, means connected to said arm for moving and returning the same, a casing supported by said arm, a piston movable in said casing and having a passageway formed therein, a contractor for contacting said objects connected to said piston, said passageway communicating with the atmosphere through said

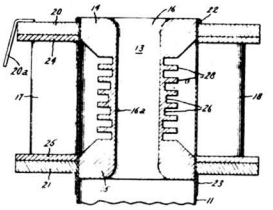


contactor, said piston being adapted to be connected to means for reducing the pressure in said passageway below that of the atmosphere, means on said arm responsive to the position of said piston for controlling said first mentioned means, and means on said arm actuated by said piston for controlling said second mentioned means.

2,680,678
METHOD OF CHEMICALLY POLISHING NICKEL
Leonard P. Fox, Lancaster, Pa., assignor to Radio Corporation of America, a corporation of Delaware
No Drawing. Application April 1, 1952, Serial No. 279,955
7 Claims. (Cl. 41—42)

3. A method of chemically polishing a nickel surface comprising treating said surface, in cleaned condition, at room temperature with a solution consisting of 60–70% by volume glacial acetic acid, 40–30% by volume concentrated nitric acid, and about 0.5 cc. concentrated hydrochloric acid acid per 100 cc. of solution.

2,681,421
MAGNETIC FOCUSING STRUCTURE FOR ELECTRON BEAMS
Richard B. Gethmann, Fayetteville, N. Y., assignor to General Electric Company, a corporation of New York
Application March 4, 1952, Serial No. 274,785
12 Claims. (Cl. 313—84)



1. A magnetic focusing structure for an electron beam comprising a generally cylindrical lens of magnetic material having a passage therethrough, said lens including a generally annular pole piece at each end thereof and an intermediate hollow cylindrical section having a varying cross section along its length, and means surrounding said lens member and impressing a magnetizing force across said pole pieces of a strength to produce saturation of said cylindrical section to produce a non-uniform magnetic potential gradient along the length of the inner surface of said hollow cylindrical section.

Chester W. Sall

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