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The Radio Direction Finding
Research Laboratory
Department of Electrical Engineering
University of Illinois

ABSTRACTS OF U.S. PATENTS ON RADIO DIRECTION FINDING

June 1, 1948

Technical Report No. 5

Contract N5-ori-71
Task Order XV

Office of Naval Research

6 AUG 1948

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ABSTRACTS

of

U.S. PATENTS

on

RADIO DIRECTION FINDING

Compiled by

Radio Direction Finding Research Group

Radio Direction Finding Laboratory
Department of Electrical Engineering
University of Illinois

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GENERAL INFORMATION

These abstracts of U.S. patents, relating to direction-finding systems considered to be non-cooperative, i.e., one in which the finding of direction does not depend on cooperation between the transmitter and the direction finder, were taken from the Official Gazette of Patent Office (U.S.). All direction-finding patents up to June 1, 1948, are listed herein with the exception of a few very early ones (prior to about 1928).

The patents are arranged numerically by the patent number appearing in the upper right-hand corner of the space provided for the individual abstracts. The pages are marked with two horizontal black lines, where they may be cut to provide for filing in a standard 5"x8" file cabinet. The assignee, where it is other than the author, is listed immediately below the word Assignee in the middle of the top of the spaces. In some cases, in order to get the entire abstract in the space provided, the abstract has been shortened by deleting the last part; an attempt has been made to cut the abstract at a point where the meaning will not be materially altered.

INDEX TO ASSIGNEES

Aga-Baltic Radio	Aga-Baltic Radio
Amer. Tel. & Teleg. Co.	American Telephone and Telegraph Co.
B.T.L.	Bell Telephone Laboratory
Bendix Aviation Corp.	Bendix Aviation Corporation
Berlin-Wausee	Berlin-Wausee (German)
Collins	Collins Radio Company
Cossor Ltd., A.C.	A.C. Cossor Ltd. (German)
F.T.R.	Federal Telephone & Radio
Fed. Tel. Co.	Federal Telephone Company
Gen. Elec. Co.	General Electric Company
Hazeltine Res. Corp.	Hazeltine Research Corporation
Intn'l S.E. Corp.	International Standard Electric Corporation
Lear Avia Inc.	Lear Avia Inc.
Lorenz	A.C. Lorenz, A.G. (German)
Operadio Corp.	Operadio Corporation
Pan. Am.	Pan American Airways
R.C.A.	Radio Corporation of America
R.P.C.	Radio Patent Corporation
SAJ, France	Societe Anonyme: Jaeger-Aviation, Levallois
SA-R, France	Societe Anonyme des Radio-electriques, France
SIDP, France	Societe Industrielle des Procedes, France
Sperry Gyroscope	Sperry Gyroscope Co.

Index to Assignees (Cont'd)

Nov. 21, 1922 | Assignee: | U.S. Pat. No. 1,435,941

Robinson, J.

"Radio Direction Finder"

ABSTRACT

A radio direction finder comprising a pair of movable aerial coils arranged at a fixed angle to one another, a radio receiver connected thereto so that the combined effect of the incoming radio waves on the two coils is received, means to cut out temporarily one movable coil, and means to insert an equivalent inductance in the circuit.

Jan. 12, 1926 | Assignee: Telefunken | U.S. Pat. No. 1,569,325

Leib, A.

"Radio Direction Finder"

ABSTRACT

A radio device comprising a frame-shaped antenna, a rotatable axis upon which the antenna is mounted, a support for the antenna having an opening for said axis of substantially greater diameter than the axis, and a spherically curved member fixed to said axis and seated upon the support so as to allow said axis to swing laterally in all directions and thereby cause it automatically to assume a vertical position regardless of inclination of the support.

July 20, 1926 | Assignee: Operadio Corp. | U.S. Pat. No. 1,593,276

Stone, J.M.

"Radio Direction Finder"

ABSTRACT

In combination, a loop aerial adapted to swing about a vertical point, a knob operably connected to said loop aerial for turning the same, and a magnetic needle moving within said knob for indicating the position of said loop.

Feb. 1, 1927 | Assignee: Amer. Tel. & Teleg. Co. | U.S. Pat. No. 1,615,913

Osborne, H.S.

"Radio Direction Finder System"

ABSTRACT

The method for determining the location of a mobile station relative to fixed stations whose separating distance is known, which consists in producing at each fixed station and transmitting therefrom a band of frequencies having definitely fixed upper and lower limits, simultaneously receiving all of the frequencies constituting the band sent from one fixed station and noting the direction of approach for maximum received current, then simultaneously receiving the frequencies constituting the band sent from the other fixed station and noting the direction of approach for maximum received current therefrom.

Oct. 18, 1927 | Assignee: Western Elec. Co. | U.S. Pat. No. 1, 645,810

Hubbard, F.A.

"Direction Finding and Indicating System"

ABSTRACT

In an arrangement for measuring the angular bearing of a source of wave energy, a transmission path for said wave energy, means for evaluating a function of the angle in lengths of transmission path and means for translating said lengths into an indication of the angle, including a translating switch and an indicator electrically controlled therefrom, said switch including terminals operable in steps varying in length in accordance with said function of said angle.

July 3, 1928 | Assignee: | U.S. Pat. No. 1,675,332

DeRegnauld de Bellescize, H.

"Direction Finder"

ABSTRACT

In the method of ascertaining the direction of a transmitting station from a receiving station with a loop antenna functioning at one time as a directional antenna and at another time as a combined directional and non-directional antenna, the steps which comprise, electrically balancing the loop antenna and setting the same as a directional antenna to the point of minimum signal reception, then electrically unbalancing said loop antenna and setting the same as a combined directional and non-directional antenna to the point of minimum signal reception, and determining from the direction of digression between these two points the sense of direction of the transmitting station.

July 31, 1928 | Assignee: S.I.D.P. | U.S. Pat. No. 1,678,737

Loth, W.A.

"System of Radiogoniometry"

ABSTRACT

In an electromagnetic direction finder device, a plurality of serially connected turns, means for short circuiting some of said turns, a current indicating device, means for connecting said current indicating device to the non-short circuited turns, said short circuiting means being included in the circuit of the indicating device.

Sept. 4, 1928 | Assignee: Fed. Tel. Co. | U.S. Pat. No. 1,683,080

Kolster, F.A.

"Radio Receiving System"

ABSTRACT

In a system for receiving electromagnetic radiations, a loop antenna having directional characteristics, means for selectively tuning said antenna, a detector circuit electrically associated with said antenna, and means for altering the wave front of radio energy which is received from a direction other than perpendicular to the axis of said loop, said means comprising an elongated conductor relatively greater in length than the diameter of said loop and arranged at an angle to the plane of said loop.

Oct. 2, 1928 | Assignee: Telefunken | U.S. Pat. No. 1,685,821

Leib, A.

"Direction Finder"

ABSTRACT

The method of radio direction finding with a loop aerial of appreciable width in which out of phase currents are caused by a distorted wave front which consists in tuning the loop aerial to the desired wave length, supplying energy from an auxiliary non-directional aerial, while in an untuned condition and transferring a component of said energy to said loop circuit so that the current in said loop circuit will be zero when its magnetic axis points at the station to be received.

Oct. 16, 1928 | Assignee: R.C.A. | U.S. Pat. No. 1,687,746

Wright, G.M.

"Directional Aerial"

ABSTRACT

The combination of a loop aerial in a vertical plane, an adjustable condenser located near the base of the loop, symmetrical leads connecting said condenser in series with the upper conductor of the loop, and a coil in the lower conductor having an intermediate point connected to ground.

Nov. 20, 1928 | Assignee: Sperry Gyroscope | U.S. Pat. No. 1,692,051

Patterson, M.L.

"Radio Direction Finder and Position Finder"

ABSTRACT

In a radio direction finder for ships, a rotatable antenna positioned beyond the effective wave-distributing field of said ship, a motor for rotating said antenna mounted adjacent thereto, a bearing indicator operatively connected to said antenna and positioned within said field, and a controller in said field for controlling said motor.

Dec. 17, 1929 | Assignee: | U.S. Pat. No. 1,739,941

Bellini, E.

"Radio Signaling System"

ABSTRACT

In a radiogoniometer system, the combination with a pair of fixed aperiodic loop aerials disposed at right angles to each other, of a closed resistance member connected to all the aerial terminals in such manner that each loop aerial circuit has included therein a pair of branched portions of said resistance, and an adjustable member cooperating with said resistance member for determining from the position of said adjustable member the line of direction of a transmitting station.

April 22, 1930 | Assignee: Telefunken | U.S. Pat. No. 1,755,180

Herzog, A.

"Arrangement for Directional Receiving"

ABSTRACT

In combination, a tuned directional and an aperiodic non-directional antennae, means for coupling said antennae comprising a circuit coupled to the directional antenna and a radio frequency amplifier coupled to the non-directional antenna, said amplifier having a reactance and a resistance in its output common to the circuit coupled to the directional antenna, means adjustably associated with said reactance for regulating phase relation between said antennae.

Sept. 1, 1931 | Assignee: R.C.A. | U.S. Pat. No. 1,773,354

Franklin, C.S.
Witt, B.J.

"Wireless-Telegraph Receiving System"

ABSTRACT

In a wireless receiving system, the combination with a pair of frame aerials of two or more radiogoniometers connected to said aerials and a receiving circuit coupled to each radiogoniometer, substantially as described.

Aug. 25, 1931 | Assignee: Fed. Tel. Co. | U.S. Pat. No. 1,820,571

Kruesi, G.G.

"Radioantenna System"

ABSTRACT

In an antenna system, an antenna comprising a pair of spaced conductors forming opposite sides of a loop, a third conductor extending in the general direction of said pair of conductors, phase shifting means associated with said third conductor, another antenna comprising a pair of spaced conductors arranged in a plane at an angle to the plane of said pair of conductors and on opposite sides thereof, means for combining said antennae, and a signaling circuit cooperatively associated with both said antennae.

Sept. 1, 1931 | Assignee: Fed. Tel. Co. | U.S. Pat. No. 1,821,650

Kolster, F.A.

"Radio System"

ABSTRACT

A radio system comprising conjugate loop antennae having their planes in angular relation, a coil having an inductance equal to the inductance of each loop, said coil having one terminal connected to a terminal of each of said loops, a pair of series connected condensers connected between the other loop terminals, a condenser connected in shunt to said series connected condensers, said condensers all having equal capacitance values, the other terminal of said coil being connected to the connection between said series connected condensers, and a symmetrical signaling circuit coupled to both said loops.

July 12, 1932 | Assignee: R.C.A. | U.S. Pat. No. 1,867,232

Roberts, W.V.B.

"Wireless Receiving System"

ABSTRACT

In a radio receiving system the combination of, a plurality of bridge circuits, a plurality of frame aerials, each frame aerial being included in one arm of one of said bridge circuits, and a plurality of radio goniometers each operatively associated with each of said bridge circuits.

Dec. 27, 1932 | Assignee: Telefunken | U.S. Pat. No. 1,892,220

Runge, W.

"Thermionic Tube for Directional Reception"

ABSTRACT

A receiving system, comprising means for the generation of a cathode ray pencil, deflection means comprising two pairs of parallel plates disposed at right angles to each other, and an electron collector adjacent the normal path of said ray, the said electron collector comprising a wedge-shaped sector, the surface of which is at right angles to the direction of the uninfluenced cathode rays, all of the sector being outside the normal path of said rays.

June 13, 1933 | Assignee: U.S. Government | U.S. Pat. No. 1,913,918

Diamond, H.
Kear, F.G.

"Triple-Modulation Directive Radio Beacon System"

ABSTRACT

In a directive radio beacon, the combination with a master oscillator, of three amplifying branches, means for converting a single phase radio frequency supply from said master oscillator into a three phase radio frequency supply, means for using each phase of said three phase source for supplying carrier power to a particular one of said amplifier branches, a means of modulating the carrier wave in each of said branches to a low frequency differing for each branch, a directive antenna system comprising two directive antennas crossed at right angles to each other, and means for transferring the modulated waves in succession from each of said three amplifier branches to said directive antenna system whereby said three modulated waves are transmitted in predetermined directions to provide a multi-course beacon space pattern.

June 27, 1933 | Assignee: Fed. Tel. Co. | U.S. Pat. No. 1,915,274

Fisher, G.R.

"Aircraft Compass"

ABSTRACT

The combination of a directional absorber of radio energy having a figure of eight characteristics, an untuned non-directional absorber of radio energy, means for combining the signal energies from the two said absorbers, means for periodically reversing the phase of the oscillatory currents in one of said absorbers with respect to those of the other absorber, a detector for the combined signal energies from the two said absorbers, an output circuit for said detector, an indicating device arranged to be energized by current from said detector, and means for periodically reversing the current through said indicating device simultaneously with reversals of phase relation between said oscillatory currents.

July 25, 1933 | Assignee: Lorenz | U.S. Pat. No. 1,920,156

Hahnemann, W.

"Antenna' for Short and Ultra-Short Waves"

ABSTRACT

An antenna arrangement for directive reception of short and ultra-short waves, comprising in combination an antenna loop having a side length not greater than one-tenth of the length of the wave to be received and an antenna lead having an effective vertical length not less than one-half of the length of the wave to be received.

Aug. 1, 1933 | Assignee: R.C.A. | U.S. Pat. No. 1,920,665

Peterson, H.O.

"Symmetrical Loop Receiver"

ABSTRACT

A method of developing oscillations consisting of balancing the oscillations in a loop by dividing the loop circuit into symmetrical circuits, conducting the oscillations from either side of the loop to an element of a thermionic relay, and by-passing part of the oscillations to a different element of another thermionic relay, whereby the local oscillations set up by either thermionic relay are neutralized.

Aug. 13, 1935 Assignee: U.S. Pat. No. 2,010,833

Willoughby, J.A.

"Radio Navigating System"

ABSTRACT

In a signal translating system adapted to receive signal energy, an audio frequency amplifying unit, a signal responsive device connected thereto, a source of electric signal energy, an independent source of intermittent radiant light energy, a light responsive cell connected in circuit with said audio frequency amplifying unit and means for focusing energy received from said source of intermittent radiant light energy upon said light responsive cell for interrupting the operation of said signal responsive device by said source of electric signal energy.

May 19, 1936 | Assignee: R.C.A. | U.S. Pat. No. 2,040,952

Peterson, H.O.

"Directional Receiver"

ABSTRACT

Directional receiving apparatus comprising, in combination, a non-directional aerial, a directional aerial, a signal combining circuit connected with both of said aerials to receive energy therefrom, means for interrupting periodically the transfer of energy by one of said aerials to said combining circuit, and means for utilizing the energy flowing in said combining circuit for producing indications.

May 19, 1936 | Assignee: B.T.L. | U.S. Pat. No. 2,041,600

Friis, H.T.

"Radio System"

ABSTRACT

A method of radio communication which comprises energizing a plurality of paths of different lengths in the transmission medium between two stations and receiving at any given instant wave energy propagated along only one of said energized paths through said medium regardless of the proximity of the incoming energized paths.

March 9, 1937 | Assignee: R.P.C. | U.S. Pat. No. 2,072,962

Piebanski, J.

"Radio System"

ABSTRACT

A directive radio system comprising a plurality of differently oriented directive aerials each adapted for receiving a common signalling frequency wave; means for changing the individual signalling currents received by said aerials into secondary currents of different predetermined characteristics; means for combining said secondary currents and deriving a single resultant output current having a predetermined selective characteristic which is a product function of the characteristics of all of said secondary currents; and means for selectively receiving said output current.

June 8, 1937 | Assignee: | U.S. Pat. No. 2,082,812

Worrall, R.H.

"Selective Antenna"

ABSTRACT

A directional receiving antenna system responsive to wave energy of a single polarization only, comprising a closed loop in a horizontal plane, a pair of conductors lying within the plane of said loop connected to and extending from the center of opposite sides thereof toward the center of said system, and a non-receptive transmission line or other type of conductor, adapted to be connected to a radio apparatus, extending to the center of said antenna system and having the wires thereof connected or coupled to said pair of conductors.

June 8, 1937 | Assignee: Bell Labs. | U.S. Pat. No. 2,083,416

Aiken, C.B.

"Radio Direction Finding System"

ABSTRACT

A method of determining the directional sense of an incoming wave which comprises obtaining two currents each representing differently phased non-directionally received components of said wave, determining their vector sum, changing in a predetermined sense the phase of only a particular one of the said two currents, and then comparing their vector sum with said first mentioned. Vector sum whereby the sense of the change in vector sum indicates the directional sense of said wave.

July 7, 1937 | Assignee: Telefunken | U.S. Pat. No. 2,085,798

Gerhard, E.

"Radio System for Locating Objects"

ABSTRACT

In a device for locating an object within a field of electromagnetic radiations, means including an ultra-short wave transmitter, having an antenna adapted to propagate an un-modulated carrier wave, a receiver having a directional antenna suitably disposed for collecting a portion of said carrier wave which is propagated over a path including a surface of reflection on said object and for collecting another portion of said wave which is propagated over a shorter path, means for modulating the energy received via the shorter path and means for combining the energies received via the two paths.

Jan. 4, 1938 | Assignee: R.C.A. | U.S. Pat. No. 2,104,075

Franklin, C.S.

"Radio Direction Finder"

ABSTRACT

A number of receivers are connected to as many pairs of directional antennae, the output of each receiver being connected to a gaseous discharge tube which serves as the indicator.

Feb. 8, 1938 | Assignee: | U.S. Pat. No. 2,107,633

Hoover, F.J.

"Direction Finder"

ABSTRACT

A directional and a non-directional antenna are connected to separate amplifiers. The signals are then mixed with the output of a local oscillator. The beat frequencies are then fed to a pair of rectifiers. To the rectifiers are connected current differential indicators. To the input of the rectifiers is also connected a phase shifting circuit the output of which is fed back to the amplifiers. The phase shift can be controlled.

May 17, 1938 | Assignee: Lorenz | U.S. Pat. No. 2,117,846

Kramer, E.

"Direction Finding Method"

ABSTRACT

The method of obtaining bearings from a non-directional radio transmitter which consists in combining a frame aerial effect with a non-directional antenna effect so that these two effects cooperate, and in adding periodically a non-directional antenna effect substantially double that of the first said non-directional antenna effect, such periodic additions being made in phase opposition to the first said non-directional antenna effect and in rhythmn for obtaining bearings.

July 26, 1938 | Assignee: | U.S. Pat. No. 2,124,544

Coulter, H.N.
Fisher, G.R.

"Visual Indication Radio Direction Finder"

ABSTRACT

From a directional antenna system two signals 180° out of phase with each other are obtained. These are applied to a balanced modulator, balanced amplifiers and detectors. The potential of the cathodes of the modulators is varied at the rate of the rectified signal. To the output of the amplifiers is also mixed a signal from a non-directional antenna. The indicator is sensitive to the difference of flow between the output and the modulator tubes.

Nov. 22, 1938 | Assignee: | U.S. Pat. No. 2,137,912

Jeffcock, J.P.

"Radio Direction Finding System"

ABSTRACT

In a direction finding system there are two directional antennae with a radio goniometer coupled to them. The field coils of the goniometer are interchangeably connectable to the directional antennae through a switching device. A non-directional antenna and the directional antennae are connected through a switch. The polar diagram of the directional antennae can be turned through a certain angle such that "the directional indications for the determination of direction and 'sense' are substantially coincident."

Jan. 10, 1939 | Assignee: R.C.A. | U.S. Pat. No. 2,145,178

Wright, G.M.

"Radio Direction Finding System"

ABSTRACT

A directional receiving system comprising a plurality of aerials, at least one of said aerials being of the directional loop type, electronic switching means comprising rectifying means of the diode type for deriving demodulated signals from said aerials, means for causing said rectifying means to differentiate between signals collected by different aerials, a cathode ray tube indicator having horizontal and vertical deflecting circuits, a local source of alternating potential fed to said switching means for actuating the same, and means for causing said switching means to apply signals derived successively from separate ones of said aerials to one of said deflecting circuits while causing said alternating potential to be fed to the other of said deflecting circuits.

Jan. 31, 1939 | Assignee: Telefunken | U.S. Pat. No. 2,145,286

Beuremann, W.

"Direction Finder"

ABSTRACT

A direction finder receiver of the heterodyne oscillator type adapted to receive signal potentials picked up by the Adcock principle comprising two antennae which are compared with each other for phase and amplitude, a heterodyne oscillator circuit, a mixer tube circuit coupled to said oscillator circuit by bilateral coupling means located between said oscillator circuit and said mixer circuit, and a pair of symmetrically arranged connections from said coupling means to each one of said antennae whereby symmetric coupling is established from said antennae to said oscillator and mixer circuits.

May 2, 1939 | Assignee: | U.S. Pat. No. 2,156,297

Kruesi, G.G.

"Radio Compass"

ABSTRACT

In a direction finding system the antennae consists of two directional antennae fixed so that there is a certain angle between the pattern maxima, and a non-directional antenna. The amplitude of the energy received is proportional to the angle of the wave with the antenna. After amplification and detection using two I F frequencies, the signals are applied to the indicator.

Aug. 22, 1939 | Assignee: Lorenz | U.S. Pat. No. 2,170,659

Kramer, E.

"Direction Finding Arrangement"

ABSTRACT

In a direction finding system the antenna consists of two equal parts connected in opposite relation. These are connected in dot-dash rythmn to an amplifier and detector. After this the signals are applied to the indicator.

Aug. 29, 1939 | Assignee: | U.S. Pat. No. 2,170,835

Simon, E.J.

"Navigational System"

ABSTRACT

The method of radio navigation, comprising receiving a radio signal simultaneously in a plurality of angularly displaced directional antennae; simultaneously and independently amplifying the signal received by each antenna equally; simultaneously and independently measuring the strength of each of said amplified signals; and utilizing the respective signal strength to determine both the direction of and distance from said source of radio signals in a single indication.

Sept. 26, 1939 | Assignee: Pan. Am. | U.S. Pat. No. 2,174,014

Sullinger, F.W.

"Direction Finder"

ABSTRACT

A radio direction finder comprising a pair of elevated spaced vertical dipoles located at a height sufficiently above ground to render negligible any difference of capacity between the lower portion of each dipole and ground and the upper portion of each dipole and ground and sufficient to prevent radio frequency ground variations from affecting the capacities of several dipoles and connected in phase opposition by interposed transmission lines, and means electrically connected between the poles of each dipole for maintaining said dipoles in electrical symmetry.

Sept. 26, 1939 | Assignee: Pan. Am. | U.S. Pat. No. 2,174,015

Sullinger, F.W.

"Direction Finder"

ABSTRACT

A radio direction finder system comprising a pair of vertical spaced antennae, a variable coupling device having separate fixed windings and an adjustable winding each fixed winding being electrically connected to one of said antennae at the electrical center of the system, means for adjusting the adjustable winding to equalize the voltages supplied by said antennae to the center of the system and adjustable means associated with said antennae for effectively orienting the directional antennae response pattern with respect to a signal source to determine the direction of said source.

Sept. 26, 1939 | Assignee: Pan. Am. | U.S. Pat. No. 2,174,016

Sullinger, F.W.

"Direction Finder"

ABSTRACT

In a radio direction finder, the combination of a pair of spaced vertical antennae, an amplifier electrically connected to each antenna and means for varying the gain of each amplifier to compensate for unequal signal voltages supplied to said amplifiers by said antennae and to equalize the signal voltages delivered by said amplifiers to render the antennae, effectively, electrically symmetrical.

Sept. 26, 1939 | Assignee: Pan. Am. | U.S. Pat. No. 2,174,017

Sullinger, F.W.

"Goniometer"

ABSTRACT

In a radio goniometer, the combination of spaced insulating frame members, a search coil rotatably mounted between said frame members, angularly related fixed coils supported on said frame and means for electrostatically shielding said fixed coils and maintaining them in electrostatic and electromagnetic symmetry comprising at least two channeled metallic frames supported on frame members in right angular relationship, and each having a separate fixed coil wound in and supported thereby.

Dec. 26, 1939 | Assignee: | U.S. Pat. No. 2,184,306

Kruesi, G.G.

"Radio Direction Finder"

ABSTRACT

A directional and a non-directional antenna are connected through tuned and phase shift circuits such that voltage remains constant and compensates for a change in phase of current outputs due to a change in frequency.

Jan. 23, 1940 | Assignee: Lorenz | U.S. Pat. No. 2,188,071

Berthold, H.

"Direction Finding Radio System"

ABSTRACT

A direction-finding radio system comprising two directional antenna circuits, a plurality of radio goniometers each consisting of two field coils and field coil circuits and one search coil circuit and having one of said field coil circuits operatively associated with one of said directional antenna circuits and the second of said field coil circuits operatively associated with the second of said antenna circuits, and coupling means mutually coupled with each other and interposed in said field coil circuits between their actual field coils and said directional antenna circuits so as to induce potentials in said field coil circuits which potentials produce currents of equal amplitude but of opposite phase with respect to reactive currents resulting from the mutual influence upon one another of said radio goniometers.

Feb. 6, 1940 | Assignee: Telefunken | U.S. Pat. No. 2,189,517

Gothe, A.

"Radio Goniometer"

ABSTRACT

A direction finding system consists of two antenna goniometers and a coupling goniometer having fixed field coils and rotatable search coils. Crossed loop antenna are connected to associated antenna goniometer field coils and their search coils are connected to the field coils of the coupling goniometer. The output of the system is fed to a receiver, the output of which is connected to the indicator.

Feb. 13, 1940 | Assignee: | U.S. Pat. No. 2,190,038

Neufeld, J.

"Position and Direction Determining System"

ABSTRACT

A direction finding system is described in which two currents are obtained from two antennae the strength of which depends on the angle of incidence. The relative intensity is the indicator of direction.

Feb. 20, 1940 | Assignee: Telefunken | U.S. Pat. No. 2,190,717

Kummich, R.
Rukop, H.

"Radio Direction Finder"

ABSTRACT

A goniometer has three differently oriented field coils, each being connected to a rotatable loop antenna. The energy collected by the rotating antennae is induced in the fixed coils of the goniometer. This energy is made to commensurate with amplitude of the energy collected by the rotating coil in the goniometer.

July 2, 1940 | Assignee: R.C.A. | U.S. Pat. No. 2,206,637

Koch, W.R.

"Direction Indicating Radio Receiver"

ABSTRACT

The outputs of two antennae are alternately connected to an amplifier and the phase change in change over from one antenna to the other is indicated by the indicator.

July 16, 1940 | Assignee: U.S.N. | U.S. Pat. No. 2,207,750

Miller, H.B.
Fisher, G.R.

"Radio Receiver and Direction Finder"

ABSTRACT

The output of a directional antenna having low frequency characteristics is amplified. The frequency is shifted to that of the output of a non-directional antenna having high frequency characteristics. The two signals are then applied to a visual indicator.

July 16, 1940 | Assignee: Telefunken | U.S. Pat. No. 2,208,349

Ulbricht, G.

"Direction Finder"

ABSTRACT

In an impulse direction finding system the antenna pattern is periodically reversed and the polarity of the received impulses is also reversed. These impulses are delayed and then combined with impulses ordinarily received. The combined impulses are applied to the indicator.

Sept. 3, 1940 | Assignee: Intn'l S.E. Corp. | U.S. Pat. No. 2,213,273

Earp, C.W.

"Radio Direction Finding Apparatus"

ABSTRACT

Apparatus for giving a direct indication of the direction of waves, comprising at least two wave collectors, means for producing two modulating waves of different wave form, means for modulating the signals received by one of said collectors with one of said modulating waves and the signals received by the other of said collectors with the other of said modulating waves and for combining said modulated signals, and means controlled jointly by said combined modulated signals and said modulating waves, and responsive to the relation between said combined modulated signals and said modulating waves for indicating the relative strengths of the signals received by said collectors.

Sept. 3, 1940 | Assignee: Lorenz | U.S. Pat. No. 2,213,281

Koschmieder, K.

"Direction Finding System"

ABSTRACT

In a direction finder system operating with a plurality of antennae, an antenna, a feed line, means for coupling said feed line to said antenna, a counterpoise operatively associated with said antenna, and an equivalent circuit constructed and arranged to stimulate the complex resistance of said antenna coupled to said antenna and counterpoise in order to secure symmetry, said equivalent circuit comprising serially connected variable capacity means, variable inductance means and variable resistance means.

Sept. 3, 1940 | Assignee: Intn'l. S.E. Corp. | U.S. Pat. No. 2,213,874

Wagstaffe, C.F.A.

"Wireless Direction Finding System"

ABSTRACT

A method of getting indication from two fixed directional antennas with maxima at a certain angle is described. The direction finding system consists of two fixed directional antennae with their directions perpendicular to each other. Signal from each antenna is modulated at a different frequency. The signals are detected after radio finding modulation. The modulation frequencies are harmonies of the same frequency. To the indicator are applied signals from the modulators and the receiver.

Sept. 10, 1940 | Assignee: | U.S. Pat. No. 2,214,342

Neufeld, J.

"Position Finding"

ABSTRACT

An arrangement for recording directions of radio waves comprising a directional antenna for receiving the said waves and producing signals representing directional components of the said waves at the point of reception, means responsive to the said components for producing indicators representing directions of the said waves, means for producing indications identifying the said waves and means for combining the said indications in form of a diagram.

Sept. 24, 1940 | Assignee: Intn'l. S.E. Corp. | U.S. Pat. No. 2,215,785

Gallant, L.C.
Nouvellon, C.

"Radio Direction Finder"

ABSTRACT

An oscillating loop antenna feeds signals to a detector amplifier. The signal is then applied to an indicator. A device shows the angle of the loop with respect to its oscillating arc.

Oct. 8, 1940 | Assignee: Lorenz | U.S. Pat. No. 2,217,413

Koschmieder, K.

"Radio Direction Finding System"

ABSTRACT

A direction antenna system responsive substantially to vertically polarized energy only comprising earthed vertical antennae, a high frequency device, horizontally disposed lines interconnecting said antennae and said device, a shield arranged about said lines, said shield inherently tending to reradiate in response to oscillations induced by horizontally polarized energy to produce a radiation field effective between said shield and earth, and means for substantially eliminating the effect of said reradiation of energy on said high frequency device comprising means supporting said shield and said lines in spaced relation with respect to said earth substantially symmetrically within said produced radiation field with respect to said antennae and said earth.

Oct. 15, 1940 | Assignee: Telefunken | U.S. Pat. No. 2,218,361

Runge, W.
Gothe, A.

"Direction Finder"

ABSTRACT

Currents from two rotatable loop antenna are combined and applied to the indicator. Current from an auxiliary loop antenna is also applied to the indicator after a phase reversal of 180°.

Nov. 5, 1940 | Assignee: R.C.A. | U.S. Pat. No. 2,220,087

Dalbeau, B.L.
Webster, W.S.

"Direction Finding"

ABSTRACT

A radio direction finder balance comprising a loop circuit having separate fixed coupling coils coupled to each side of said loop circuit, a fixed auxiliary antenna and a switching device, a fixed sense coil connected through said switching device to said auxiliary antenna and coupled to one of said separate coupling coils, a balance coil also connected through said switching device to said fixed antenna and inductively coupled to another of said separate coupling to another of said separate coupling coils, and means for varying the coupling between said balance coil and at least one of said separate coupling coils so as to couple energy in said loop circuit in either one direction or another.

Nov. 26, 1940 | Assignee: | U.S. Pat. No. 2,223,056

Berthold, H.

"Radio Direction Finding System"

ABSTRACT

A direction finding system consisting of two directional antennae. Each antenna has a number of loop circuits and radio goniometers. One coil of each goniometer is connected to the loop circuit and the other coil to a similar loop circuit of the other antenna. The loop systems are symmetrically coupled to receivers. The coupling is such that it produces in loop circuits currents of substantially equal amplitude but of opposite phase with respect to reactive currents tending to result from the mutual influence of the goniometers on each other.

Nov. 26, 1940 | Assignee: Lorenz | U.S. Pat. No. 2,223,069

Kalz, B.

"Radio Direction Finding System"

ABSTRACT

A directional frame antenna and a non-directional antenna are connected to a receiver. The phase of the directional antenna is varied from coincidence to opposition with that of the non-directional antenna output and vice versa. The potential of the non-directional antenna can also be varied during phase change. This is done by applying ground potential to a variable tap on the antenna.

Dec. 3, 1940 | Assignee: Aga-Baltic Radio | U.S. Pat. No. 2,223,513

Frasson, F.

"Radio Direction Finder"

ABSTRACT

An impedance is connected across the output of one of the two directional and non-directional antennae of a direction finding system. The phase of the other antenna output is changed and another impedance from this output is connected to a variable tap on the first impedance. The tap is moved at a periodically varying speed.

Dec. 24, 1940 | Assignee: Telefunken | U.S. Pat. No. 2,226,379

Kummich, R.
Gothe, A.

"Direction Finder"

ABSTRACT

The antenna system of a direction finding system consists of two parallel loop antennae connected in parallel at two ends of a rotatable shaft with equal arms. At the middle is another loop antenna which can be connected parallel or perpendicular to the other two antenna.

Dec. 31, 1940 | Assignee: | U.S. Pat. No. 2,226,929

Hefele, E.J.

"Direction Finding System"

ABSTRACT

In a radio direction indicator system a rotatable directional antenna for receiving transmitted radio signals with intensity in accordance to the angular position of the antenna with respect to the signal waves; means connected to said antenna for amplifying said signals; means for rectifying said signals to produce corresponding direct current signals; means for reversing the polarity of the direct currents comprising a direct current amplifier stage, the input of said amplifier stage being conductively connected to said rectifying means, and electronic means comprising an evacuated envelope containing a fluoroscent element, a source of electrons arranged to impinge on said element to produce a luminous image thereon, and an electrode responsive to said direct current signals for controlling the size of said luminous image whereby a minimum shadow occurs for minimum signal reception.

Jan. 28, 1941 | Assignee: SA-R, France | U.S. Pat. No. 2,230,160

Lehmann, G.J.

"Radio Device for Measuring Angles"

ABSTRACT

Automatic wireless direction finding device for measuring the angle formed by the direction of a datum line with the direction to be found, in which a transmitting station is positioned, this device comprising a directional antenna continuously rotating at a substantially constant speed, whereby the angle to be measured is swept through at each revolution of said antenna, and a receiver provided with means for producing a periodic current which is of a constant strength during rotation of said antenna corresponding to the sweep of the angle to be measured and is nil during the remainder of the sweep, and an apparatus for measuring the mean strength of the periodically interrupted current thus produced.

Feb. 18, 1941 | Assignee: | U.S. Pat. No. 2,231,929

Layman, X.J.

"Tridimensional Radio Direction Indicator"

ABSTRACT

A method consisting of a scanning device of transmitting and receiving antenna coupled to detector and amplifier to indicate an obstacle is described. A device to automatically orient the antenna such that the obstacle is in the center of the scanning range is also described.

Feb. 25, 1941 | Assignee: Telefunken | U.S. Pat. No. 2,233,374

Johnske, F.
Rabmann, J.
Linke, J.

"Radio Direction Finder"

ABSTRACT

A direction finder including a directional antenna means for rotating continuously said antenna, an indicator responsive to currents derived from said antenna for indicating the position of the fronts of waves impressed upon said antenna with respect to a reference line, and means connected between said indicator and said antenna for stabalizing the relative amplitudes of the side bands created by the rotation of said directional antenna in the fields of said waves.

Mar. 11, 1941 | Assignee: R.C.A. | U.S. Pat. No. 2,234,331

Bond, D.S.

"Ultra High Frequency Radio Direction Finding"

ABSTRACT

A ultra high-frequency direction finding system consisting of two dipoles arranged opposite and parallel to each other at a fraction of wavelength apart; the output of one of these dipoles being alternately reversed in phase. This is then combined with the output of the other dipole and the resultant demodulated. The rectified signal is applied to the indicator which determines the phase with respect to the reversing voltage.

Apr. 15, 1941 | Assignee: Telefunken | U.S. Pat. No. 2,238,129

Paul, H.E.

"Directional Radio Receiver"

ABSTRACT

A direction finding system is described which has two directional antennae and the indicator is responsive to the amplitudes of the received signals.

May 6, 1941 | Assignee: Telefunken | U.S. Pat. No. 2,241,170

Ulbricht, G.

"Method for Receiving Periodic Impulses"

ABSTRACT

In an impulse-modulated d.f. system the method of reducing errors due to the interference of echo impulses with the reception of main impulses which includes the steps of receiving said main and echo impulses, generating local oscillations having a frequency differing from the carrier frequency of said impulses by a fixed amount, combining said received impulses and said local oscillations to produce a constant frequency beat frequency current which corresponds to the combination of the frequency of the local oscillator and one side band frequency of the main impulse-modulated carrier, and a varying frequency beat frequency current which changes with changes in the phase of the echo carrier current, selectively passing currents of the frequency of said constant beat frequency currents and rejecting currents of other frequencies, and indicating the amplitude of said selectively passed currents.

May 13, 1941 | Assignee: | U.S. Pat. No. 2,241,915

Kramer, Ernest

"Direction Finding System"

ABSTRACT

In a cooperative system two signals are obtained, each signal including signal elements of different length. After detection these signals produce induction impulses of opposite polarity indicating beginning and end of each signal element. These impulses are applied to an instrument having four magnetic poles and two crossed coils. The deflection of the coil serves as the indicator.

May 20, 1941 | Assignee: | U.S. Pat. No. 2,242,530

Libby, T.M.

"Radio Direction Finder"

ABSTRACT

Contains a device of continuously indicating the plane of a wave front at a point.

June 3, 1941 | Assignee: Telefunken | U.S. Pat. No. 2,244,628

Kotowski, P.

"Antenna With Steerable Polarization Characteristics"

ABSTRACT

A directional aerial system comprising a plurality of aerial groups, each of said groups comprising elements individually responsive to horizontally and to vertically polarized energy, means for combining the output from said elements in an adjustable phase relationship whereby the resultant polarization response of each group is variable and means for combining the output of all of said groups into a single receiver, the phase of the energy from each group being separately adjustable with respect to the other groups whereby the directivity of said system is variable.

Aug. 5, 1941 | Assignee: | U.S. Pat. No. 2,251,708

Hefele, E.J.

"Direction Finder Antenna System"

ABSTRACT

A radio direction finder system comprising a first non-directional antenna; a second non-directional antenna; means for combining the signal outputs of said first and second antennae to successively form differently oriented polar cardioid reception patterns; an indicator; and means for producing right-left indications on said indicator in accordance with the relative position of the antennae with respect to the signal source.

Aug. 12, 1941 | Assignee: R.C.A. | U.S. Pat. No. 2,252,063

Cockerell, C.S.

"Radio Direction Finder"

ABSTRACT

In a direction finder radio receiving installation, the combination including means for deriving directionally received signal components, means for deriving two omni-directionally received signal components, means for combining said omni-directionally received components in phase opposition to one another, means for cyclically varying the relative amplitudes of said components, means for combining said directionally received component in phase quadrature with said combined components to produce a resultant, and indicating means responsive to the instantaneous amplitude of said resultant.

Sept. 2, 1941 | Assignee: SA:J, France | U.S. Pat. No. 2,254,943

Gallo, J.B.P.H.

"Radio Direction Finding"

ABSTRACT

A direction finding system consisting of two directional antonna perpendicular to each other, a phase meter and a modulating system for magnetic core is described. All the three components named are coupled to a magnetic core. Output of this core is fed to the indicator.

Nov. 18, 1941 | Assignee: Int'l. S.E. Corp. | U.S. Pat. No. 2,263,377

Busignies, H.S.
Bac, F.

"System for Indicating the Direction of Propagation of Electromagnetic Waves"

ABSTRACT

In a direction finding system a varying voltage wave is obtained from a rotating loop. This wave is applied to a phase splitting device. The voltage variations and the split-up phase are applied to the two pairs of cathode ray oscilloscope.

Dec. 16, 1941 | Assignee: U.S. Government | U.S. Pat. No. 2,266,038

Hinmon, W.S.

"Radio Direction-Finder"

ABSTRACT

In a direction finding system a device is described by which the signal applied to the receiver from a single loop antenna is proportional, alternately, to the sum and difference of directional and non-directional antenna pattern of the loop.

Dec. 30, 1941 | Assignee: R.C.A. | U.S. Pat. No. 2,268,065

Roberts, W.V.B.

"Radio Direction Finder"

ABSTRACT

In a direction finding system a directional antenna gives rise to voltages whose amplitude and phase depend on the orientation of the antenna. This voltage is modulated and then a voltage independent of orientation is obtained from it. Another voltage in quadrature phase with the last mentioned voltage is obtained. These two voltages are then applied to a pair of detectors. The output of the detectors are applied to an indicator.

Feb. 24, 1942 | Assignee: R.C.A. | U.S. Pat. No. 2,274,546

Hugenholtz, E.H.

"Radio Compass"

ABSTRACT

A radio compass having a pair of crossed directional antennas and a non-directional antenna, means for modulating with currents of different frequency the currents derived from waves intercepted by said directional antennas, means for deriving a current from said non-directional antenna, means for combining the current from said antenna with said currents derived from said directional antennas, means for detecting the thus modulated and combined currents, means for rectifying said detected currents, means for rectifying the modulating currents of different frequency, means for combining the rectified detected currents and the rectified modulating currents, a directional indicator, and means for applying the two combined rectified currents to said indicator to indicate the angle between the said wave fronts and one of said directional antennas.

Mar. 24, 1942 | Assignee: | U.S. Pat. No. 2,277,464

Taylor, L.A.

"Radio Locating and Following System"

ABSTRACT

Two directional radiators producing superimposed fields having a constant relation of phase and amplitude to each other are used in combination with one directional receiver. The object is located at one of the nodes in the field and means are provided for following the object.

Apr. 14, 1942 | Assignee: Telefunken | U.S. Pat. No. 2,279,466

Johnsko, F.
Rohmann, F.

"Radio Direction Finder"

ABSTRACT

This direction finding system consists of one main radio receiving channel which includes an apparatus to obtain current corresponding to a figure of eight "8" receiving pattern, and an auxiliary receiving channel which gives unidirectional response. From the auxiliary channel a current having an amplitude equal to and limited to the maximum amplitude of current corresponding to the main channel and having a minimum equal in phase and magnitude to current corresponding to one of the minimum of the main channel is obtained. This current is fed to a current limiter so adjusted that the controlling currents are substantially constant over approximately 180° of response pattern of the auxiliary channel. This current is then applied to the indicator.

May 12, 1942 | Assignee: | U.S. Pat. No. 2,282,402

Hefele, E.J.

"Automatic Radio Direction Indicator System"

ABSTRACT

In a right-left indicating direction finder system, a non-directional antenna; a directional antenna; a radio frequency amplifier for each of said antennae; an electromechanical indicator having fixed members and unrestrained movable members; circuit connections from said radio frequency amplifiers to said fixed and to said movable members for applying radio frequency signals thereto; said movable and fixed members coacting on each other to produce a rotation of said movable members to indicate the relative values of the signals in said amplifiers when energy is being received from each of said antennae and to maintain said movable member at its zero position when energy is received from said non-directional antenna and substantially no energy is received from said directional antenna.

June 2, 1942 | Assignee: Lorenz | U.S. Pat. No. 2,285,081

Borthold, H.

"Direction Finding Receiver"

ABSTRACT

A direction finding receiver comprising a radio receiver, a bi-directional antenna and an auxiliary non-directional antenna for this receiver, an aperiodic amplifier for such auxiliary antenna, a change-over switch movable into different positions for connection of such auxiliary antennas corresponding to null finding and sensing operations. The auxiliary antennas are inter-connected to the receiver which is sensitive for null-positions.

June 23, 1942 | Assignee: | U.S. Pat. No. 2,287,623

Klein, N.E.

"Direction Finding Apparatus"

ABSTRACT

An indicating device comprising an electromagnet rotatable about an axis adjacent one end thereof, means for producing cyclical current variations in said electromagnet, means for rotating said electromagnet conductive material which has the characteristic of producing localized magnetic poles whose orientation is determined by the periodicity of said current variations and the rate of rotation of said electromagnet, said disc being mounted substantially perpendicular to the axis of rotation of said electromagnet, and a rotatable indicating magnet positionally responsive to the orientation of said localized poles in said disc and mounted so that said disc is between said electro-magnet and said indicating magnet.

Aug. 25, 1942 | Assignee: R.C.A. | U.S. Pat. No. 2,293,739

Komp. R.J.

"Radio Direction Finder"

ABSTRACT

A direction finder including, in combination, a pair of crossed pattern directional aerial systems, a pair of channels having substantially equal phase shifts and amplification factors respectively coupled to said pairs of aerials, a cathode ray tube including deflecting elements and anode and cathode electrodes, means for applying the signals from said pair of channels respectively to the deflecting elements of said tube, a high tension power source for said tube including a potentiometer, means connecting the anode and cathode electrodes of said cathode ray tube to said potentiometer, an electron discharge device including a cathode and anode connected to said potentiometer, and means for applying the received signals to said device so that the connection of the cathode and anode of said electron discharge device to said potentiometer offers an impedance varying as a function of said received signal amplitude.

Sept. 8, 1942 | Assignee: Westinghouse Elec. | U.S. Pat. No. 2,295,412

Little, D.G.

"Radio Direction Finder"

ABSTRACT

In a system for visually indicating the magnitude and phase relationship of electrical currents, a source of current to be indicated, a cathode ray tube having principal electrodes for producing and directing a beam of cathode rays upon a screen, said electrodes being continuously energized to project a continuous beam on said screen, means for deflecting said beam radially with respect to the center of said screen at a uniform rate in a circular path and an auxiliary ring-shaped electrode positioned within said tube between said deflecting means and said screen, said electrode having a diameter larger than that of said circular path, and concentric therewith, circuit means for connecting said source between said auxiliary electrode and one of said principal electrodes.

Sept. 29, 1942 | Assignee: Berlin-Wausee | U.S. Pat. No. 2,297,249

Runge, W.

"Double Frame Direction Finder with Visual Indicator"

ABSTRACT

A direction finding system in which the output of one directional antenna and the phase difference of two other directional antennae is applied to the indicator.

Sept. 29, 1942 | Assignee: | U.S. Pat. No. 2,297,414

Janovsky, F.

"Direction Finding System"

ABSTRACT

A direction finder system comprising a plurality of antenna elements, a main goniometer, and means for compensating periodically recurring octantal errors in the operation of said system caused by effective rotation of an antenna having elements spaced an appreciable distance with respect to the wave-length of operation comprising an auxiliary goniometer, means for electrically coupling said goniometers together in parallel, and transmission gearing having a ratio of 1:5 to rotate said auxiliary goniometer five revolutions for each revolution of said main goniometer and in the same direction.

Oct. 6, 1942 | Assignee: R.C.A. | U.S. Pat. No. 2,297,896

Katzin, M.

"Wide Bank Electromagnetic Horn Antenna"

ABSTRACT

An antenna system comprising a pair of elongated horn antennae arranged side by side and having their longitudinal axes arranged in the same direction, said antennae being spaced along the direction of arrival of signals, one from the other, a distance equal to an odd multiple, including unity, of a quarter of the operating wave-length, a transmission line connecting said antennae together, and a transducer connected to said transmission line at such point along said line that phase shift caused by said spacing is compensated.

Dec. 22, 1942 | Assignee: F.T.R. | U.S. Pat. No. 2,306,113

Alford, A.

"Antenna System"

ABSTRACT

A radio beacon system comprising a pair of antennae each designed to transmit substantially only horizontally polarized waves and spaced less than a half wavelength apart at the operating frequency, means for energizing said antennae in phase coincidence with energy of said operating frequency characterized by a particular signal and means for energizing said antennae in phase opposition with energy of said operating frequency characterized by a different signal, whereby four guiding courses are provided consisting only of horizontally polarized energy waves.

Jan. 19, 1943 | Assignee: Lear Avia Inc. | U.S. Pat. No. 2,308,521

Lear, W.P.

"Automatic Radio Direction Finder"

ABSTRACT

In a directional radio system: a non-directional antenna; a rotatable directional antenna; a local source of low frequency current; receiver means including circuit connections to said anquency control signal of phase corresponding to the sense of off-null deviation of said rotatable directional antenna with respect to the oncoming direction of radio waves received by the antennae; reversible motor means; a clutch for coupling said motor means with said directional antenna; and selective, electronic control means in circuit with said clutch and responsive to said current source and control signal in accordance with the relative phase relations thereof for producing a corresponding control current to engage said clutch to rotate said directional antenna until it assumes a substantially null signal relation with respect to the received radio waves.

Feb. 2, 1942 | Assignee: Westinghouse | U.S. Pat. No. 2,310,052

Bartholy, F.E.

"Radio Direction Finding System"

ABSTRACT

A direction finding system consisting of a loop antenna and mechanical oscillator.

Mar. 2, 1943 | Assignee: | U.S. Pat. No. 2,312,421

Koschmieder, K.

"Direction Finding System"

ABSTRACT

In a direction finding system, a directional antenna system, a non-directional antenna system, means for coupling said systems comprising an asymmetric high frequency line having a grounded and an ungrounded conductor, a transformer having a primary winding in circuit with said directional antenna system and a pair of secondary windings, said secondary windings being wound in opposition to each other, a connection joining adjacent ends of said windings with the ungrounded conductor of said line, the outer terminals of said windings being connected to said grounded conductor, a goniometer field coil connected in series in said ungrounded conductor, a choke coil connected across said field coil, said non-directional antenna system being connected to the middle point of said choke coil.

Mar. 9, 1943 | Assignee: F.T.R. | U.S. Pat. No. 2,313,047

Busignies, H.G.

"Direction Finding System"

ABSTRACT

Energy received by a non-directional antenna is fed to the receiver. Also fed is the energy received by a directional antenna which is corrected alternately in phase and 90° out of phase with the non-directional antenna. The receiver output is coupled to the indicator.

Mar. 16, 1943 | Assignee: R.C.A. | U.S. Pat. No. 2,314,029

Bond, D.S.
Carlson, W.L.

"Self-Orienting Radio Direction Finder"

ABSTRACT

In a radio direction finder, the combination of a directive antenna, a non-directive antenna, an amplifier connected to said directive antenna, said amplifier including means for shifting the phase of the amplified currents in a constant direction independently of their frequency, a modulation current source, a balanced modulator connected to said source and supplied with high frequency currents derived from said directive antenna for modulating said last mentioned derived currents to produce currents of side band frequency, a radio receiver, means for applying a carrier frequency current derived from said non-directive antenna and currents of side band frequency derived from said directive antenna to said receiver.

March 16, 1943 | Assignee; R.C.A. | U.S. Pat. No. 2,314,093

Landon, V.D.

"Automatic Radio Direction Finder"

ABSTRACT

Outputs of two directional antenna are modulated separately by balanced modulators. The demodulated voltage from the output of the receiver is used to control the modulation for equal modulation of the two signals.

Aug. 10, 1943 Assignee: U.S. Pat. No. 2,326,337

DiRenzo, S.

"Radio Compass Direction Finder"

ABSTRACT

In a radio direction finder for ships, a loop antenna, a vertically extending shaft arranged to support and rotate said loop antenna, a housing containing gyro compass repeater mechanism, said housing being directly and rigidly attached to said shaft; the vertical axes of said housing and said shaft being in alignment, so that said shaft and said housing rotate concentrically on a common vertical axis, a calibrated scale, a fixed index adjacent to said calibrated scale, a second vertical shaft.

Sept. 14, 1943 | Assignee: | U.S. Pat. No. 2,329,199

Hefele, E.J.

"Right-Left Direction Finder System"

ABSTRACT

In a directional system: a loop antenna mounted on a moving vehicle and rotatable with respect to the direction to the transmitter station of the received signals as the direction of travel of the vehicle changes with respect to the direction to the transmitting station of the received signal for receiving signals in the radiation field varying in magnitude in accordance with the relation of the plane of the loop to the direction to the transmitting station; a non-directional antenna for receiving signals from the same station; an amplifier connected to said loop antenna; an amplifier connected to said non-directional antenna; a cathode ray tube having a first and second pair of deflecting plates.

June 1, 1943 | Assignee: Intn'l S.E. Co. | U.S. Pat. No. 2,334,247

Busignies, H.G.

"Detected Signal Direction Finder"

ABSTRACT

A direction finding system including an effectively rotatable receiving antenna, a receiver coupled to said antenna, a cathode ray indicator, means for causing a radial displacement of the cathode ray beam of said indicator, a detector in the output of said receiver for producing a detected envelope pattern of energy derived from said antenna, said detector being of the type which produces at the output thereof only one of the upper and lower halves of the received carrier wave and means for applying said detected envelope together with the carrier frequency to said means for causing radial displacement of said beam, to produce an illuminated pattern on the screen of said cathode ray tube.

Dec. 28, 1943 | Assignee: R.C.A. | U.S.Pat. No. 2,337,964

Blodgett, E.D.

"Direction Finder"

ABSTRACT

A radio direction finder including two rotatable directive antennas arranged at right angles to each other and a non-directive antenna, two azimuth scales displaced by 90 degrees with respect to each other and rotatable with said directive antennas, a switch arranged to select either of said directive antennas, a second switch arranged to control the connection of said non-directive antenna, and a shutter arranged to expose selectively either of said azimuth scales according to the positions of said switches.

Aug. 29, 1944 | Assignee: Bendix Aviation Corp. | U.S. Pat. No. 2,356,922

Eltgroth, G.V.

"Direction Finding Apparatus"

ABSTRACT

In a radio direction finder including a directional antenna, a non-directional antenna, a switching oscillator, a modulator and a demodulator, said radio direction finder providing at the output of the demodulator an alternating voltage at the frequency of the switching oscillations which reverses in phase with respect to the switching oscillator output voltage as the directional antenna is rotated through the position of zero signal pickup; a plurality of grid controlled gas discharge tubes having a cathode, a control grid and an anode, a current responsive control device connected into each of the anode circuits of said tubes, means for supplying energy at the frequency of said switching oscillator output to the anode circuits of said tubes.

Oct. 17, 1944 | Assignee: R.C.A. | U.S. Pat. No. 2,360,810

Carlson, W.L.
Bond, D.S.

"Self-Orienting Radio Direction Finder"

ABSTRACT

In a radio direction finder including an indicator, the method of determining direction which comprises deriving a current of carrier frequency from a signal wave whose wave front is to be determined, deriving communication signals from said wave, deriving a second carrier current, modulating said second carrier current by a modulation current, eliminating said second carrier durrent, deriving currents of side band frequency from said modulated currents, combining said currents of side band frequency and said first-mentioned carrier currents, obtaining from said combined currents a modulating frequency current.

Nov. 7, 1944 | Assignee: Sperry Gyroscope | U.S. Pat. No. 2,361,956

Moseley, F.L.

"Automatic Position Indicating System"

ABSTRACT

In an automatic position indicating system, a directional antenna, motive means for orienting said antenna, a radio receiver fed from said antenna, motive means for tuning said receiver, commutating means for controlling said last named motive means, and means associated with said commutating means for tuning said receiver in sequence to a plurality of stations; said first named motive means acting to turn said directional antenna toward said stations in sequence and for predetermined periods in respective synchronism with the tuning-in of these stations.

Dec. 12, 1944 | Assignee: A.C. Cossor Ltd. | U.S. Pat. No. 2,365,118

Straffor, F.R.W.

"Electrical Apparatus"

ABSTRACT

A direction finder radio receiving system comprising a pair of half wave dipoles spaced half a wavelength apart, a pair of feeders having their input ends connected one to each dipole and their output ends connected to each other, a second pair of feeders, one having its input end connected to the junction of said first pair of feeders and the other having its input end connected to a topping on one of said first pair of feeders, a radio receiver, and switching means to connect said receiver alternately to the output end of either of said second pair of feeders.

Dec. 19, 1944 | Assignee: Lear Avia Inc. | U.S. Pat. No. 2,365,347

Lear, W.P.

"Radio Direction Indicator System"

ABSTRACT

In combination with a rotatable directional antenna a reversible electric motor for controlling the rotation of said antenna; mechanism for manually rotating said antenna comprising a crank, a cable joining said crank with said antenna and a member normally uncoupling said crank from said cable; and an electromagnetic clutch in circuit with said motor mechanically coupling said antenna and motor when said motor is energized to rotate the antenna and normally uncoupling said motor from the antenna when the motor is deenergized.

Feb. 13, 1945 | Assignee: Sperry Gyroscope | U.S. Pat. No. 2,369,132

Browder, J.E.

"Radio Direction Finder"

ABSTRACT

In a radio receiving circuit, a shiftable directional receiving antenna, a low frequency source, means for modulating the radio frequency output of said antenna at the frequency of said source, a second receiving antenna, a receiver having an input jointly derived from the modulated output of said first antenna and the unmodulated output of said second antenna, said two antennae receiving waves from the same source, means for selecting from the output of said receiver a component having a frequency twice the frequency of said low frequency source means connected to said receiver output for shifting said directional antenna toward a predetermined position.

July 10, 1945 | Assignee: | U.S. Pat. No. 2,379,909

Kilpatrick, E.L.

"Determining Vertical Angles of Incidence of Radio Waves"

ABSTRACT

A loop system for measuring the vertical angle of incidence of energy waves, having a planar axis mounted in the vertical plane of incidence of the waves and tiltable about an axis perpendicular thereto, and comprising a pair of identical loop antennas mounted in symmetrical co-planar relation on opposite sides of said planar axis with their plane rotatable about said planar axis a receiver connected to receive voltages from said two loops in mutually subtracting relation, said loop-plane being rotated about said planar axis to orient the loops in a flux cutting position which may be their maximum flux cutting position in said energy waves.

Sept. 4, 1945 | Assignee: Lear Inc. | U.S. Pat. No. 2,384,317

Lear, W.P.

"Radio Direction Finding System"

ABSTRACT

In a radio directional system, a non-directional antenna and a radio frequency amplifier coupled thereto, a rotatable directional loop antenna, a balanced modulator stage responsive to signals from said loop antenna, means for biasing said modulator stage to substantially near cut-off, a control signal oscillator in circuit connection with said modulator stage to modulate radio frequency signals received by said loop antenna, means including circuit connections for coupling the output of said modulator stage to said radio frequency amplifier, means responsive to the output of said radio frequency amplifier for indicating the direction of the radio waves.

Jan. 8, 1946 | Assignee: | U.S. Pat. No. 2,392,420

Steinhoff, J.R.

"Apparatus for Radio Direction Finding"

ABSTRACT

In a radio directional receiver having directional pick-up means for receiving signals from a distant transmitter, an electrical indicating instrument having an indicator pointer, means responsive to said signal for rotating said indicator pointer, a normally fixed adjustable compensating coil in said instrument, means maintained in fixed position relative to the indicator pointer for creating a magnetic field, said adjustable coil being positionable in said instrument so as to react in said magnetic field for the purpose of retarding or accelerating the rotation of the indicator pointer to compensate for errors caused by absorption or reflection of radio waves in the proximity of said pick-up means.

Jan. 22, 1946 | Assignee: Collins | U.S. Pat. No. 2,393,353

Wirkler, W.H.

"Method and Apparatus for Medium and High Frequency Direction Finders"

ABSTRACT

In a direction finder system a three pair directionally disposed antenna arrangement comprising radio frequency energy collecting means, central station apparatus, conductors leading from said central station apparatus to said radio frequency energy collecting means, amplifiers interposed between the ends of said conductors and the radio frequency energy collecting means constituting each of said antenna systems, said amplifiers each including multi-grid balanced electron tube circuits, connections between certain of said grids with said radio frequency energy collecting means, a source of heterodyne injection voltage in said central station apparatus, and means interconnecting said source of heterodyne injection voltage with others of the grids of said balanced amplifier circuits.

March 5, 1946 | Assignee: U.S.N. | U.S. Pat. No. 2,395,871

Kilpatrick, E.L.
Houghton, J.W.

"System for Determining Dimensional Angle of Approach or Incidence of Radio Waves"

ABSTRACT

The antenna system consists of a pair of electrically identical loops having their planes located in electrical symmetry on opposite side of the axis. The method of detection consists in rotating these loops till identical signals are received by the two loops.

Mar. 28, 1946 | Assignee: U.S. Government | U.S. Pat. No. 2,397,128

Cole, E.
McCoy, E.

"Radio Adapter Unit"

ABSTRACT

An antenna system with more or less cardioid response pattern and means of periodically switching this pattern through 180° is used. When the approaching wavefront is not parallel to the antenna, then the output becomes modulated, the modulation frequency depending on the rate of switching and the direction of the wave-front. The modulating envelope is recovered and applied to the indicating device.

Apr. 16, 1946 | Assignee: R.C.A. | U.S. Pat. No. 2,398,551

Norton, L.E.

"Direction Finder"

ABSTRACT

The antenna system consists of a number of spaced antennas each comprising a series of isolated conductors of relatively short length compared to the wave length of the highest frequency at which the system is to operate. A signal differing in frequency from the arriving carrier wave is radiated and the resulting field produces in the various antennas signals corresponding to the strength at that point. After filtration and detection the phase of the best frequency in the various antennae is compared.

Apr. 16, 1946 | Assignee: R.C.A. | U.S. Pat. No. 2,398,552

Norton, L.E.

"Direction Finder"

ABSTRACT

The antenna system and the receiver are similar to No. 2,398,551. In this case the phase of the different signals is compared by a device which indicates the quotient of the phase differences of three filter outputs. The indicator device gives the geometric sum of the two quotients.

July 16, 1946 | Assignee: Int'l. S.E. Corp. | U.S. Pat. No. 2,403,967

Busignies, H.G.

"Radio Direction Finder"

ABSTRACT

Rotating antenna picks up the incoming signal, the amplitude of which depends on the direction of the incoming wave. This signal modulates a radio frequency carrier which after detection is applied to the indicator.

July 16, 1946 | Assignee: | U.S. Pat. No. 2,404,012

Worall, R.W.

"Radio Direction Finder"

ABSTRACT

Direction finder means, comprising a shielding housing, a detachable vertical shielding tube rotatably mounted thereon, a horizontal shielding tube detachably mounted at its longitudinal center on said vertical tube, an upper and a lower vertical detachable collector secured at each end on said horizontal shielding tube and insulated therefrom and from each other, a conductor inside said horizontal shielding tube connecting each said upper collector to said lower collector at the opposite end of said horizontal shielding tube, insulating guide means to rotate the common plane of said conductors from the vertical at each end of said horizontal shielding tube to the horizontal at its center two down leads extending through said vertical shielding tube.

Aug. 6, 1946 | Assignee: | U.S. Pat. No. 2,405,203

Goldstein, M.K.

"Phase Type Direct Indicating Direction Finder"

ABSTRACT

Means for determining the direction of a radio wave, comprising a pair of spaced antennas, means modulating the voltage induced by said wave in one of said antennas with a low frequency voltage, means superimposing on the resulting voltage, the voltage induced in the other of said antennas, means amplifying the resultant of said superimposed voltages, and phase detecting means deriving from said amplified voltage a voltage having the frequency of said modulating voltage, and the amplitude of which is directly proportional to the sine of the angle of phase difference between said voltages induced in said antennas.

Aug. 27, 1946 | Assignee: United Air Lines | U.S. Pat. No. 2,406,406

Sandretto, P.C.
Buckthal, E.P.

"Radio Direction Finder"

ABSTRACT

Two loop antennas are rotated at a constant speed. The signals received coupled in turn to a signal received by a non-directional antenna in parallel and anti-parallel relations and then coupled to a receiver which in turn is coupled to an indicator.

Aug. 27, 1946 | Assignee: Hazeltine Res. | U.S. Pat. No. 2,406,468

Laughlin, B.D.

"Direction Indicating System"

ABSTRACT

In a radiant energy system of the type which effects the translation of direction-indicating modulation signals at least one of which is of pulse wave form over at least two space paths extending between an antenna of one antenna system and individual spaced antennas of another antenna system, a direction-indicating device for indicating with relation to a predetermined reference plane the direction of one of said antenna systems relative to the other comprising means for receiving said modulation signal of pulse wave form translated over one of said space paths, means responsive to the modulation signal translated over the other of said space paths for providing a reference signal of saw-tooth wave form having a characteristic which varies with time.

Aug. 27, 1946 | Assignee: United Airlines, Inc. | U.S. Pat. No. 2,406,637

Sandretto, P.C.
Buckthal, P.

"Radio Direction Finder"

ABSTRACT

In a radio direction finder system having an antenna station and a remotely located control station connected by a transmission line, the combination of rotatable directional antenna means at said antenna station, radio receiver means at said antenna station including a plurality of channels respectively tuned to receive signals of different pre-selected frequencies picked up by said antenna means, means at said control station for selectively imposing on said transmission line control signals of a predetermined frequency having preselected characteristics, means at said antenna station responsive to said control signals for selectively connecting between said transmission line and said antenna means a selected one of said channels of said receiver.

Sept. 24, 1946 | Assignee: Intn'l. S.E. Corp. | U.S. Pat. No. 2,408,039

Busignies, H.G.

"Electronic Rotation Direction Finder"

ABSTRACT

A direction finder comprising an aerial system means for producing an effective rotation of said aerial system to produce an indicating voltage dependent upon the effective angular position of said aerial system with respect to a source of radiation, a cathode ray tube indicator having an electrode system for producing a cathode ray beam, means for producing a rotation of said cathode ray beam in timed relation with effective rotation of said aerial system, means comprising a saw-tooth oscillation generator having a period equal to a predetermined number of rotations of said beam for causing a velocity modulation of said beam to produce a lateral deviation of said beam, and means comprising an electrode controlled by said indicating voltage for controlling the intensity of said beam for applying said indicating voltage to said cathode ray tube to obtain a direction indication.

Sept. 24, 1946 | Assignee: Intn'l. S.E. Corp. | U.S. Pat. No. 2,408,040

Busignies, H.G.

"Distorting Direction Finder Receiver"

ABSTRACT

A direction finder comprising means for producing an effective rotation of a directive receiving antenna to produce a wave pattern envelope dependent upon the speed of rotation, a cathode ray indicator comprising means for producing an electron beam, means for rotating said beam in predetermined time relation with the effective rotation of said antenna, means for applying signals of said envelope to said indicator during substantially the entire time of each rotation of said beam to produce radial displacement of the electron beam during rotation, and means for accelerating said radial displacement with envelope amplitude changes, comprising an electron tube having a sharply rising output with change in input voltage, said tube being conductive for substantially all values of input voltage.

Sept. 24, 1946 | Assignee: F.T.R. | U.S. Pat. No. 2,408,041

Busignies, H.G.

"Instantaneous Visual Direction Finder"

ABSTRACT

A direction indicating arrangement including cathode ray tube, comprising an electron gun for producing a cathode ray beam, deflecting means for producing a rotation of said elsdtron beam, and a pair of radial deflection electrodes arranged in the path of said beam, one of said electrodes being of hollow frusto-conical shape and the other electrode being of substantially conical shape so that the said cathode ray beam while rotating passes through the annular space between said electrodes receiver means including effectively rotating directional antenna means and means for detecting signals received by said antenna means, and means for applying a potential proportional to said detected signals between said radial deflection electrodes, whereby said beam may be deflected over the screen of said cathode ray tube to produce a relatively sharp visual direction indication thereon.

Sept. 24, 1946 | Assignee: Collins | U.S. Pat. No. 2,408,118

Wirkler, W.H.

"Azimuth Radio Direction Finding System"

ABSTRACT

A direction finding system comprising a plurality of stationary geographically spaced receiving antennae, an injector antenna centrally disposed with respect to said receiving antennae, means for electrically exciting said injector antenna for impressing heterodyning energy upon said plurality of geographically spaced receiving antennae, independent receiving circuits connected with said plurality of geographically spaced receiving antennae, a polyphase circuit interconnected with the outputs of said independent receiving circuits, an angularly shiftable indicator, and means for magnetically controlling said indicator connected with said polyphase circuit whereby said indicator may be moved to a position corresponding to the position of a radio transmitting source with respect to said stationary geographically spaced receiving antennae.

Sept. 24, 1946 | Assignee: Collins | U.S. Pat. No. 2,408,119

Wirkler, W.H.

"Heterodyne Radio Direction Finding System"

ABSTRACT

In a radio direction finding system, the method of determining the radio frequency time-phase of signal voltages induced in different parts of a directional antenna system which comprises supplying radio frequency energy locally in equal relation to the different parts of the antenna system for inducing therein second voltages of like phase characteristics, the frequency of said locally supplied energy being different from that of the signal energy in a relatively small degree, separately mixing the voltages induced in each part of the antenna system to obtain separate low frequency components the phase relation of which is the same as that of the signal voltages induced in the different parts of the antenna system.

Sept. 24, 1946 | Assignee: Collins | U.S. Pat. No. 2,408,120

Wirkler, W.H.

"Radio Direction Finding System"

ABSTRACT

In a radio direction finding system, a directional antenna system including at least two receiving antennae, two separate receiving circuits, commutator means for alternately connecting said receiving circuits individually to each of said receiving antennae, means cooperatively energized by the outputs of both said receiving circuits for producing a voltage proportional to the phase difference of the signals received at the respective antennae, and visual indicating means energized by said voltage with said commutator means producing a reversal in the sense of the indication of said voltage upon the alternate connection of said receiving circuits with respect to said antennae.

Sept. 24, 1946 | Assignee: Collins | U.S. Pat. No. 2,408,121

Wirkler, W.H.

"Direction Finding System with Frequency Shift"

ABSTRACT

In a heterodyne radio direction finding system including at least two receiving antennas and superheterodyne receiving circuits, locally energized injector antenna means coupled in like relation to said receiving antennas, each of said super-heterodyne receiving circuits having components of intermediate frequency derived from signal energy and from injected energy, means for producing an indicating direct voltage proportional to the phase difference in the currents at the outputs of the superheterodyne receiving circuits, and visual indicating means energized by said voltage; the method of maintaining the significant phase difference in said output currents substantially equal to an off-bearing phase difference in signal waves incident at said receiving antennas.

Sept. 24, 1946 | Assignee: Collins | U.S. Pat. No. 2,408,122

Winkler, W.H.

"Heterodyne Direction Finder with Single Receiver"

ABSTRACT

In a heterodyne radio direction finding system, in combination: a directional antenna system, including a pair of signal receiving antennae and a locally energized injector antenna coupled in like relation to both said receiving antennae; a receiving circuit including detector means; switching means for connecting said receiving circuit alternately with each of said receiving antennae for producing heterodyne output beat frequency components, derived in said detector means from received signal energy and energy from said injector antenna, and varying in phase relation as the signals received at the respective receiving antennae; said beat frequency components being interrupted at the frequency of said switching means and constituting amplitude modulation sidebands of the switching frequency proportional in amplitude to the phase relation of said beat frequency components.

Feb. 4, 1947 | Assignee: | U.S. Pat. No. 2,415,088

Dingley, E.N. Jr.

"Radio Direction Finder"

ABSTRACT

A method of determining the azimuth angle between a selected line and the path of an incoming distant radio wave, comprising the steps of collecting energy from said wave at two spaced points on said line determining a first phase angle between the waves at the two said points of collection, collecting energy from said wave at two other points spaced from each other the same distance as are the first mentioned two points and on a line normal to said selected line midway between the first mentioned two points, determining a second phase angle between the waves at the second mentioned two points, determining the ratio between the said second phase angle and said first phase angle, which ratio evaluates the tangent of said azimuth angle, and from said tangent determining said azimuth angle.

Feb. 18, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,415,954

Luck, D.G.C.

"Radio Direction Finding"

ABSTRACT

A radio direction finder including an Adcock array of spaced stationary antennas, a local radiation source coupled to said array, and a plurality of detectors, one connected to each diagonally related pair of antennas of said array, and one connected to a control antenna thereof, so as to derive from a wave of which the direction of arrival is to be determined, beat frequency voltages having amplitudes respectively proportional to the cosine and the sine of the angle of said direction of arrival with respect to a reference line, and a beat frequency voltage having an amplitude independent of the angle of said direction of arrival; means for interpreting said beat frequency voltages in terms of an angle.

Feb. 18, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,415,955

Luck, D.G.C.

"Radio Direction Finding"

ABSTRACT

A radio direction finder including in combination an array of pairs of spaced stationary antennas, a local radiation source, and a plurality of radio receivers connected to said antennas whereby a wave arriving at said antenna array will produce a beat voltage at the output of each receiver having a frequency equal to the difference in the frequencies of the local source and the arriving wave, said beat voltages being related in phase in accordance with the direction of arrival of said wave, a limiter device connected in the output of each of said receivers whereby the peaks of the waves of said beat voltages are clipped off at a constant amplitude, a cathode ray indicator including pairs of deflecting elements and a control element, means for combining differentially the resulting waves derived from one pair of antennas and applying the resultant voltage to one pair of said deflecting elements.

Mar. 11, 1947 | Assignee: C.E. Co. | U.S. Pat. No. 2,417,248

Godet, S.

"Pulse Direction Finder"

ABSTRACT

In combination, a radio antenna system having an axis of orientation, means to render said antenna system more responsive to waves from a direction at a small angle to said axis than from any other, means to rotate said direction about said axis of orientation, means to radiate pulses and to receive echoes thereof on said antenna from a remote object, whereby said echoes vary cyclically in intensity in accord with said rotation and also vary in intensity in accord with the range of said remote object and in accord with the variations in the reflecting surfaces of said object with movement thereof from which said echoes are received, means to maintain the output from said receiving means within a narrow range of variation in intensity notwithstanding wide variation in range to said object.

Mar. 11, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,417,310

Luck, D.G.C.

"Radio Direction Finder"

ABSTRACT

A radio direction finder including a receiver provided with automatic gain control means responsive with relatively slight delay to increase of signal and with relatively great delay to decrease of signal an auxiliary rectifier connected to said receiver and responsive with negligible delay to the amplitude of the output thereof to provide a control voltage having a predetermined relationship to said amplitude, a voltage threshold device connected to said rectifier and responsive to said control voltage to provide output only when said control voltage exceeds a predetermined magnitude, and indicator means connected to said threshold device. A radio direction finder including a radio receiver with automatic gain control, means responsive to the amplitude of the output of said receiver to provide a control voltage proportional to said amplitude, and indicator and a threshold device connected to said indicator.

April 1, 1947 | Assignee: U.S. Government | U.S. Pat. No. 2,418,143

Stodla, E.K.

"Signal Comparison System"

ABSTRACT

The receiving antenna for reflected energy have a pattern slightly overlapping each other. The two antenna are used alternately and signals applied to two indicators. A reference signal generated to get a standard indication.

Apr. 1, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,418,308

Luck, D.G.C.

"Radio Direction Finder"

ABSTRACT

The method of determining the elevation of arrival of electro-magnetic waves at a point comprising the steps of deriving from said waves a first voltage having an amplitude which is a function of said elevation, deriving a second voltage which is a similar function of said elevation, times the cosine of the angle of said elevation, and determining the ratio of said first voltage to said second voltage.

May 6, 1947 | Assignee: B.T.L. | U.S. Pat. No. 2,419,943

Edwards, C.F.

"High Frequency Direction Finder"

ABSTRACT

Automatic gain control provided in radar receiving circuits (two channels) for decreasing the effect of fading.

May 6, 1947 | Assignee: B.T.L. | U.S. Pat. No. 2,419,946

Edwards, C.F.

"High-Frequency Direction Finder"

ABSTRACT

In combination with a system for determining the direction of an incoming wave comprising a pair of receiving channels each having a separate automatic gain regulator controlled by the received energy, means for maintaining the gains in the channels equal and substantially independent of the arrival direction and fading of incoming wave comprising a source of radio energy connected through paths of equal length to the channels for supplying to the channels control wave components each having a large magnitude relative to the incoming wave.

May 6, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,419,987

Carlson, W.L.

"Direction Finder"

ABSTRACT

A radio direction finder comprising a directive antenna, a non-directive antenna, a generator of low frequency oscillations, reactance means in the circuit of one antenna, means for varying reactance in response to low frequency oscillations, means for combining the outputs of the antennae, a demodulating circuit connected to respond to combined antenna output, and an indicator responsive to the combined output of demodulating circuit and low frequency generator.

May 6, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,419,994

Hansell, C.W.

"Direction Finding"

ABSTRACT

In apparatus of the class described at least two directional pick-up devices in the field of a source of radiant energy, connections to one said pick-up for producing wave energy of a first frequency. Connections to the other for producing wave energy of a second frequency; their amplitudes depending on the position of the pick-up antenna with respect to said source. Both waves applied to an amplitude limiter to which is coupled a wave length modulation detector output of this applied to an indicator.

May 13, 1947 | Assignee: | U.S. Pat. No. 2,420,395

Greene, C.B.

"Radio Direction Finding Circuit"

ABSTRACT

Radio direction finding apparatus, a directional antenna, means for tuning the directional antenna to a reference radio transmitter, a pair of balanced carrier suppresser tube electrode assemblies, circuit means including a phase inverting tube coupled to directional antenna and having a capacitive coupling to carrier suppresser tube electrode assemblies for exciting suppresser tube electrode assemblies in reverse signal phase from directional antenna, an oscillator connected to alternately bias the suppresser tube electrode assemblies, an amplifier, a non-directional antenna tunable to the reference transmitter and capacitor means coupling the outputs of the suppresser tube electrode assemblies and that of non-directional antenna to the amplifier.

May 13, 1947 | Assignee: | U.S. Pat. No. 2,420,439

Morrison, M.

"Aircraft Range Finder and Direction Finder"

ABSTRACT

In an apparatus for range-finding of a source of one frequency wave propagation comprising two wave receivers in space relation providing a base-line for range reckoning, a generator of selectable frequency providing heterodyning for each of the outputs of said receivers, a narrow-fixed band-pass filter for each of said outputs passing only the heterodyned frequency thereof, and a comparator for said filter outputs providing means conjointly with said base line to reckon the range of said source.

May 27, 1947 | Assignee: F.T.R. | U.S. Pat. No. 2,421,009

Busignies, H.G.
Richardson, A.G.

"Direction Finding System"

ABSTRACT

A direction finding system comprising a plurality of antenna elements arranged in a directive array, a direction finder receiver disposed at a distance from antenna elements, a plurality of high frequency transmission lines smaller in number than number of antenna elements which extend from antenna elements to the receiver, a plurality of vacuum tube amplifiers connected to couple each antenna element to one of the lines at least two different antenna elements being thereby coupled to a given line, means for supplying operating power to coupling amplifiers including separate conductors extending between individual amplifiers and a remote control point, and switch means at control point for opening operating conductors to separately disable amplifiers.

June 10, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,422,026

Luck, D.G.C.

"Radio Direction Finder"

ABSTRACT

A radio direction finder system including a plurality of vertical conductive rods disposed at a substantial elevation above the ground surface, horizontal conductive members disposed with their midpoints respectively adjacent the lower ends of the vertical rods, transmission lines coupled to the respective lower ends and midpoints and extending vertically downward to the ground surface, the transmission lines extending horizontally along the ground surface to a point substantially equidistant from the vertical conductive rods.

June 10, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,422,073

Bond, D.S.

"Radio Direction Finder"

ABSTRACT

A radio direction finder comprising orthogonally related directive antennas, three local oscillators, modulator arranged to combine the outputs of one pair of oscillators, modulator arranged to modulate the output of one of the antennas with the combined output of the pair of oscillators, a second modulator arranged to modulate the output of the other of the antennas with the combined outputs of another pair of oscillators, a non-directive antenna, means for combining the modulated outputs of directive antennas with the output of non-directive antenna, a radio receiver connected to respond to the last mentioned combined outputs, filter arranged to separate the different modulation components in the output of the receiver, demodulators connected to convert modulation components to alternating voltages having amplitudes proportional respectively to the amplitudes of the outputs of directive antennas.

June 10, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,422,096

Hansell, C.W.

"Direction Finding System"

ABSTRACT

The method of determining the azimuth of arrival of an electromagnetic wave comprising the steps of deriving from the wave two signals differently related in their amplitudes to the angle between the line of arrival of the wave and a reference direction, modulating the signals in opposite modulation phases, combining modulated signals to produce a first modulator component related in amplitude to the sum of the amplitudes of the signals and a second modulation component related in amplitude to the difference of the amplitudes of the signals, amplifying the combined signals, separating amplified modulation components, controlling the amplification of combined signals in response to the magnitude of one of the amplified components, and determining azimuth as a function of the magnitude of the other of the amplified modulation components.

June 10, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,422,107

Luck, D.G.C.

"Radio Direction Finder"

ABSTRACT

A radio direction finder comprising a plurality of independent arrays of spaced antennas having different directivity patterns, separate channels associated with each array comprising means for deriving voltages related to each other in accordance with the differences in phase of the signals derived at the different antennas of an array from an incident wave. A bearing indicator, and means responsive to the outputs of the arrays for connecting bearing indicator to be activated through one of the channels.

June 10, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,422,108

Luck, D.G.C.

"Radio Direction Finder"

ABSTRACT

A warning system for radio direction finders including orthogonally related horizontal dipole antennas, a vertical antenna, a voltage responsive indicator, and switching means arranged to cyclically and successively connect antennas to indicator. A warning system for radio direction finders including two horizontal dipoles arranged at right angles to each other, a goniometer connected to the dipoles, means for operating the goniometer to provide an output simulating that of a single horizontal dipole rotating about a central vertical axis, a vertical dipole, an amplifier, periodic switching means arranged to connect goniometer output and the vertical antenna cyclically and successively to the amplifier, a cathode ray tube provided with orthogonally disposed deflection means, connections between the output of the amplifier and one of the deflection means, and a source of voltage of rectangular wave form connected to the other deflection means.

June 10, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,422,109

Luck, D.G.C.

"Radio Direction Finding"

ABSTRACT

A system for recording the time and origin of radio transmission including a facsimile recorder, a motor arranged to drive the recorder, means for producing alternating current synchronous with the scanning of the recorder, a plurality of antenna arrays at spaced points, means associated with each of the arrays for providing a rotating directive pattern in response to the alternating current, a receiver connected to each of the arrays so as to provide an output related in phase with the alternating current in accordance with the direction of wave arrival, means for producing impulses in response to the output of each of the receivers, of characteristics distinguishable from the impulses produced in response to the output of each of the other receivers.

June 10, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,422,122

Norton, L.E.

"Radio Direction Finding"

ABSTRACT

In combination with a direction finding system including a bilaterally responsive directional receiver system, a non-directive sense receiver system and azimuth indication connected to the receiver systems, means for preventing response of the indicator to sky-wave signals comprising detector connected to the sense receiver, impulse generator connected to the detector, and means responsive to the impulse generator to substantially disconnect the azimuth indicator from the directional receiver at the end of a predetermined period after reception by the sense receiver of the initial portion of a signal.

June 10, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,422,123

Norton, L.E.

"Direction Finder"

ABSTRACT

A radio direction finder including a directive antenna array, a radiation injection antenna, radio receiver connected to the directive array, a limiter connected to an intermediate frequency circuit of the receiver so as to provide intermediate frequency voltage with modulation removed, a local source of low frequency voltage, a balanced modulator connected directly to the limiter and to low frequency source, a second balanced modulator connected through 90 degree phase shifters to the limiter and to low frequency source, a third balanced modulator connected directly to the output circuits of first two balanced modulators, a fourth balanced modulator connected through a 90 degree phase shifter to the output circuit of first two balanced modulators, a beat frequency oscillator connected through a phase shifting network to third and fourth balanced modulators.

June 24, 1947 | Assignee: Stan. Tel. & Cables Ltd. | U.S. Pat. No. 2,423,064

Earp, C.W.
James, I.R.J.
Cleaver, R.F.

"Radio Direction Finding Equipment"

ABSTRACT

In a radio direction finder apparatus two spaced non-directional aerials, two direction finder equipments, an impedance bridge, means for coupling one aerial to a first arm of said bridge, means for coupling the other aerial to a second opposite arm of said bridge, impedances in the third and fourth arms of said bridge of such kind and magnitude as to balance said bridge, a connection from one pair of opposite corners of said bridge to one said equipment and a connection from the other pair of opposite corners of said bridge to the other said equipment.

July 8, 1947 | Assignee: B.T.L. | U.S. Pat. No. 2,423,437

Budenbom, H.T.

"Direction Finder"

ABSTRACT

The method of determining the sense and direction of an incoming wave which comprises obtaining two currents of the same frequency from two separately and non-directionally absorbed components of said wave, producing a circular representation of one of the currents and causing the other current to alter a particular point or portion of said representation depending upon the phase relation of said components as absorbed.

July 8, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,423,523

Shmurak, B.
Hulst, G.D.

"Pulse Direction Finder System"

ABSTRACT

Receiving apparatus for receiving radio pulses, said apparatus comprising a pulse receiver, a cathode ray indicator tube having a horizontal deflecting means and a vertical deflecting means, means for producing a sawtooth deflecting wave which may be made to recur in snychronism with the received pulses, said sawtooth wave having a gradually sloping portion and a steep return-line portion, means for applying said sawtooth wave to said horizontal deflecting means, means for producing periodically recurring electrical pulses, each of substantially the same duration as one of said sawtooth wave portions and occurring simultaneously therewith, means for applying said last pulses to said vertical deflecting means.

Aug. 5, 1947 | Assignee: F.T.R. | U.S. Pat. No. 2,424,967

Busignies, H.G.

"Direction Finding System"

ABSTRACT

A direction finding system comprising directive antenna, means for effectively rotating the directivity thereof, means for producing a synchronizing signal for controlling the rotating means, receiver and detector means coupled to the antenna, cathode ray indicating apparatus including means for producing an effectively rotating field therein in synchronism with the effective rotation of the antenna in response to a receipt of the synchronizing signal, and deflection means responsive to signals from the receiver and detector for setting up field variation within the cathode ray indicator corresponding to variations of the output of the receiver and detector for various angular positions of the effective rotation, and transmission line means connected at one end to the means producing a synchronizing signal and at the other end to the means producing an effectively rotating field.

Aug. 12, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,425,383

Luck, D.G.C.

"Radio Direction Finding"

ABSTRACT

A radio direction finder system including a wave collector element, means for revolving the element in a circular path about a fixed point whereby a signal picked up by the element is phase modulated at a frequency equal to the frequency of revolution of the element and in a phase determined by the azimuth of arrival of the signal, a cathode ray tube provided with orthogonally disposed deflection means, radial deflection means and a beam intensity control electrode, means for applying the phase modulated signal to the orthogonally related electrodes to produce circular deflection of the cathode ray beam of the tube whereby a circular scanning pattern is produced on the screen of the tube, a pulse generator connected to the radial deflection means, means for controlling the generator to produce pulses at a repetition frequency substantially equal to the carrier frequency of the phase modulated signal.

Aug. 12, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,425,385

Norton, L.E.

"Direction Finder"

ABSTRACT

In a radio direction finder system providing phase modulation of the carrier of an arriving wave, the method of determining the azimuth of arrival of the wave, comprising the steps of locally generating an unmodulated voltage having a frequency equal to the frequency of the carrier, locally generating a second voltage having a frequency equal to the frequency of the phase modulation of the carrier, further modulating the phase modulated carrier with the second locally generated voltage, adjusting the phases of the carrier and of the second locally generated voltage so that the superimposed phase modulations of the carrier are opposite, and measuring the magnitudes of the phase adjustments.

Aug. 12, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,425,386

Norton, L.E.

"Direction Finder"

ABSTRACT

In a radio direction finder system providing phase modulation of the carrier of an arriving wave, the method of determining the azimuth of arrival of the wave, comprising the steps of locally generating a modulated voltage having a frequency equal to that of the carrier of the wave, converting the phase modulated signal to an intermediate frequency, continuously comparing the intermediate frequency voltage in phase to derive a third voltage having a frequency equal to that of the phase modulation of the signal carrier, locally generating a fourth voltage of constant phase having a frequency equal to the phase modulation of the signal carrier, and comparing the phases of the third and fourth voltages.

Aug. 12, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,425,387

Norton, L.E.

"Direction Finder"

ABSTRACT

A radio direction finder system comprising a fixed antenna and a substantially resonant antenna, means for revolving the substantially resonant antenna about the fixed antenna as a center, a radio receiver including a demodulator connected to the fixed antenna, means for locally generating an alternating voltage corresponding in instantaneous magnitude to the angular position of the revoluble antenna with respect to a predetermined reference line, and means for comparing the phase of the voltage with the phase of the output voltage of the demodulator.

Aug. 26, 1947 | Assignee: F.T.R. | U.S. Pat. No. 2,426,175

Busignies, H.G.

"Direction Finder"

ABSTRACT

In a direction finder of the type having two spaced antenna means coupled together in phase opposition to provide a directional antenna, a translator, a transmission line coupling the directional antenna system to the translator, an omni-directional sensing antenna, and a second transmission line for coupling the omni-directional antenna to the translator, the combination of means for assuring in-phase relationship between energy from the omni-directional antenna and from the directional antenna system in the translator device, comprising a pair of conductor lines forming at least a part of one of the transmission lines intermediate one of the antennae and the translator, the conductor lines differing in length, and being coupled together co-phasally at their ends arranged nearest the one antenna and in phase opposition at their ends remote from one antenna.

Aug. 26, 1947 | Assignee: F.T.R. | U.S. Pat. No. 2,426,176

Busignies, H.G.

"Direction Finder"

ABSTRACT

A direction finder system comprising directive means for receiving energy polarized in a first given plane, indicator means for producing a direction indication in response to the received energy, means for receiving energy polarized in a second plane normal to the first plane, and means responsive to the energy polarized in the second plane for cutting off energy from the indicator means whenever received energy polarized in the second plane exceeds a predetermined level.

Sept. 23, 1947 | Assignee: | U.S. Pat. No. 2,427,657

Cule, R.I.

"Radio Direction Finding Apparatus"

ABSTRACT

A direction finding radio system comprising in combination, a directional antenna, an omni-directional antenna, first switch means reciprocating at a rate to produce visual persistance or an oscillograph screen for combining the respective signal energies of the antennae in phase coincidence and phase opposition, a receiver for amplifying and rectifying the combined signal energies, an oscillograph having horizontal and vertical deflection means for indicating the comparative magnitudes of the combined signal energies, a source of constant voltage connected to the horizontal deflection means of the oscillograph, second switch means connecting the combined signal energies to the vertical deflection means of the oscillograph, and third switch means connecting the constant voltage to the horizontal deflection means of the oscillograph.

Sept. 23, 1947 | Assignee: | U.S. Pat. No. 2,427,660

Colton, R.B.
Corput, R.V.D.
Watson, P.E.

"Radio Direction Finding System"

ABSTRACT

Means for determining the direction of arrival of wave energy comprising; a collector having at least two co-planar directional elements coupled to a common receiver, the elements being so phasally related that the direction of maximum response of the collector is normally perpendicular to the plane thereof; means for so dephasing the elements, relative to each other, as to cylically wobble the direction of maximum response symmetrically about the perpendicular, whereby a plurality of groups of signals is obtained each of whose amplitude is a function of the instantaneous direction of the direction of maximum response; means for simultaneously indicating the relative amplitudes of the groups of signals.

Oct. 21, 1947 | Assignee: Hazeltine Res. Corp. | U.S. Pat. No. 2,429,519

Loughlin, B.D.

"Radiant-Energy Signal Direction Finder"

ABSTRACT

A direction finder for determining the direction of reception of a particular radiant-energy signal comprising, a pick-up system having a directive pattern, means for controlling the pick-up system to cause the directive pattern to rotate through a predetermined azimuth, line-tracing means, means for controlling the line-tracing means to trace a line at a frequency which is related to the frequency of rotation of the directive pattern by an integer greater than unity, and means responsive only to the amplitudes of signals picked up within a predetermined fractional portion of the azimuthal rotation for shifting the line traced by the line-tracing means in accordance therewith to trace at least a portion of the directive pattern.

Dec. 2, 1947 | Assignee: Hazeltine Res. Corp. | U.S. Pat. No. 2,431,989

Craib, J.F.

"Radiated Signal Direction Finder"

ABSTRACT

A direction finder comprising, a receiving pick-up system having a directive pattern, means for controlling the pick-up system to cause the directive pattern to rotate, a cathode ray tube line-tracing device, means for normally controlling the cathode ray of the device to trace a predetermined line in synchronism with the rotation of the directive pattern, means responsive to the amplitude of a signal received by the pick-up system for shifting the line traced by the device in accordance therewith to trace the directive pattern, and means for producing a magnetic field for cyclically effecting equal and opposite incremental displacements of any directive pattern traced by the device to cause the intersection of which sharply indicate the direction of reception of the received signal.

Dec. 16, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,432,777

Luck, D.G.C.

"Radio Direction Finder"

ABSTRACT

A radio direction finder system in which is incorporated an Adcock antenna array including spaced vertical antennas connected to direction indicating apparatus, and a plurality of auxiliary antennas so positioned with respect to the antennas of the Adcock array that the nearest and the second nearest neighboring antennas of each of the Adcock antennas are radially symmetrical with respect to the Adcock antennas.

Dec. 16, 1947 | Assignee: R.C.A. | U.S. Pat. No. 2,432,926

Norton, L.E.

"Direction Finder"

ABSTRACT

A radio direction finder system including a signal collector element, means for revolving the element in a closed path about a predetermined point whereby signals picked up by the element are phase modulated at the frequency of revolution of the element and in a phase determined by the azimuth of the signal, a local oscillator, means of adjusting this oscillator to operate at the carrier frequency of the signal, means responsive to the output of the signal, means responsive to the output of the local oscillator and to the phase modulated signal to produce a voltage corresponding to phase modulation, an alternator mechanically coupled to the antenna to provide an A-C voltage corresponding in instantaneous magnitude to the angular position of the antenna about the point and means responsive to the difference in phase between the modulation voltage and the output of the generator for indicating the bearing of the signals.

Jan. 27, 1948 | Assignee: | U.S. Pat. No. 2,434,977

Worrall, R.H.

"Radio Direction Finder"

ABSTRACT

In a radio direction finder, a wave sensitive receiver, a housing for the receiver, a generator to supply power to the receiver located within the housing and having its stator secured thereto, collecting means connected to the receiver and mounted integrally with the housing, supporting means for sustaining the housing and parts connected therewith at a height above the ground upon which the supporting mean rests, hearing means associated with the supporting means and the housing to permit free rotation of the housing and parts connected therewith about an axis passing through the rotor of the generator.

Mar. 16, 1948 | Assignee: B.T.L. | U.S. Pat. No. 2,437,695

Jansky, K.G.

"Three-Dimension Radio Direction Finder"

ABSTRACT

A method of determining the absolute direction in space of a radio wave which comprises simultaneously receiving three electric components of the wave, simultaneously obtaining a voltage representing the phase relation of one pair of components and another voltage representing the phase relation of another pair of components, and obtaining from these voltages two simultaneous indications representing the wave arrival angles on two perpendicularly related planes.

April 6, 1948 | Assignee: F.T.R. | U.S. Pat. No. 2,438,846

Richardson, A.G.
Thomas, F.G.

"Radio Direction Finding System"

ABSTRACT

A radio direction finding system having a directional receiving antenna and a translator having a continuously rotating means for deriving from the received energy a voltage which varies with the angular position of the rotating means and with the direction of the received energy, the combination of means for producing sweep voltages, an oscilloscope controlled by the sweep voltages and the derived voltage, a sweep oscillator having an output voltage for controlling the sweep voltages producing means, a pulsing circuit for producing pulses at a predetermined angular position of the rotating means, and means for applying these pulses to the oscillator for synchronizing the output voltage with the derived voltage, whereby the oscilloscope indicates the direction line of received energy.

May 4, 1948 | Assignee: | U.S. Pat. No. 2,440,682

Hansel, P.G.

"Radio Direction Finder"

ABSTRACT

A direction finding system for radio signals undergoing a fading cycle. It comprises a direction finding receiver, a means to average the signal strengths of the fading signal over a period of time which includes variations of signal strengths in the fading signal, a means to isolate shorter period components of the fading signals, means to combine the average signal strengths with the isolated short period components, a direction indicator, and means to feed the combined signals into the direction indicator only when the combined signals reach a predetermined threshold value of amplitude.

May 18, 1948 | Assignee: R.C.A. | U.S. Pat. No. 2,441,658

Blodgett, E.D.
Bond, D.S.

"Direction Finder"

ABSTRACT

A radio direction finder including a directive antenna having substantially a single-lobed responsive pattern, means cyclically varying the direction of the pattern with respect to the antenna alternately between two over-lapping positions, means including a shaft for rotating the antenna about a predetermined axis, a radio receiver connected to the antenna, a rectifier connected to the radio receiver, a cathode ray tube including a fluorescent screen, means responsive to the angular position of the shaft to deflect the cathode ray of the tube radially outward from the center of the screen in a direction corresponding to the angular position, and means responsive to the output of the rectifier to control the extent of the radial deflection directly in accordance with the output of the receiver.

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