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R. K. POTTER

1,794,418

RADIO RECEIVING CIRCUIT

Original Filed Dec. 4, 1926

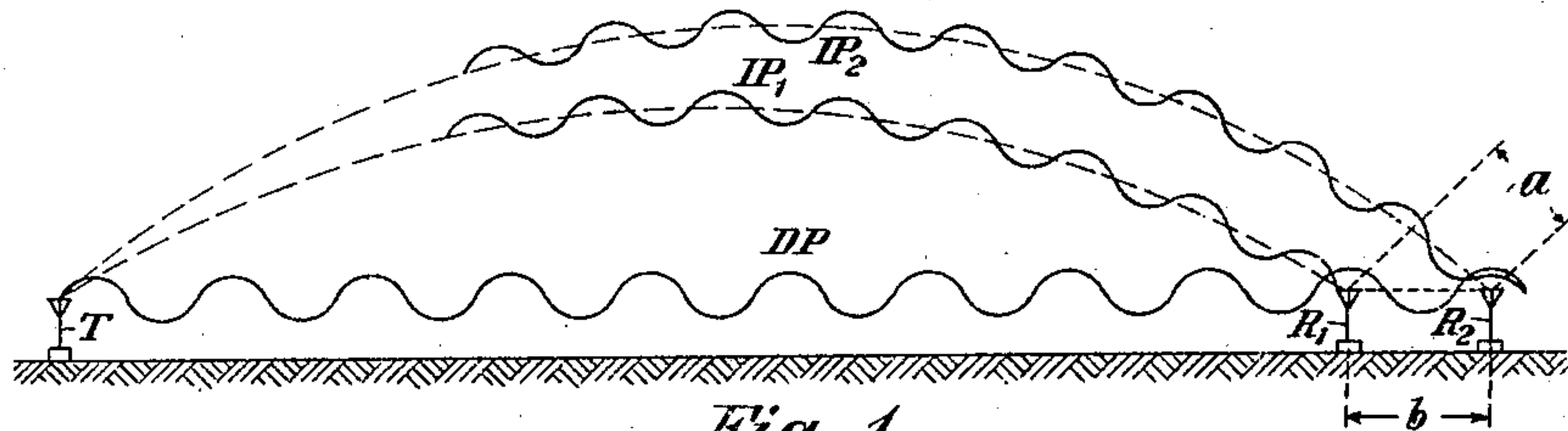


Fig. 1

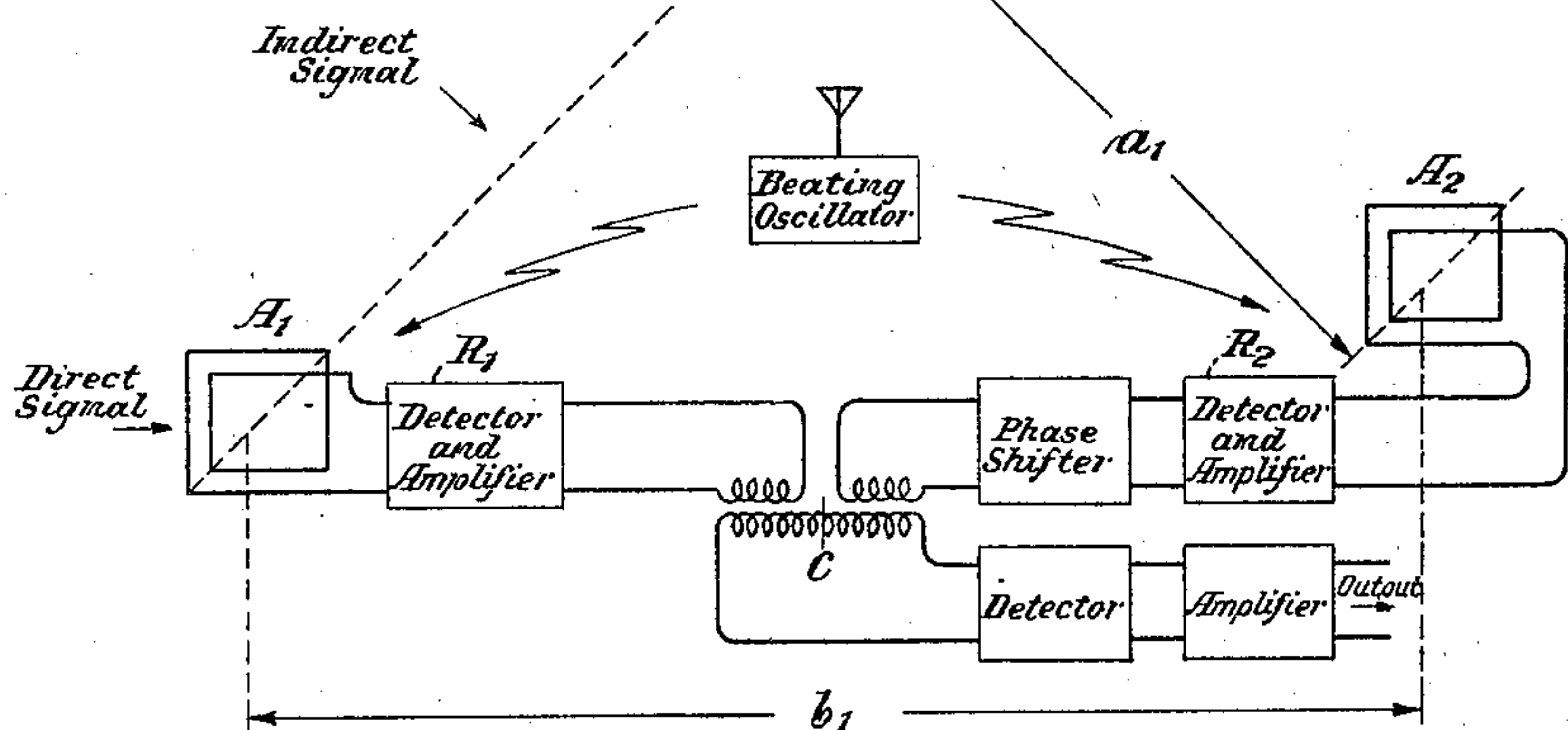


Fig. 2

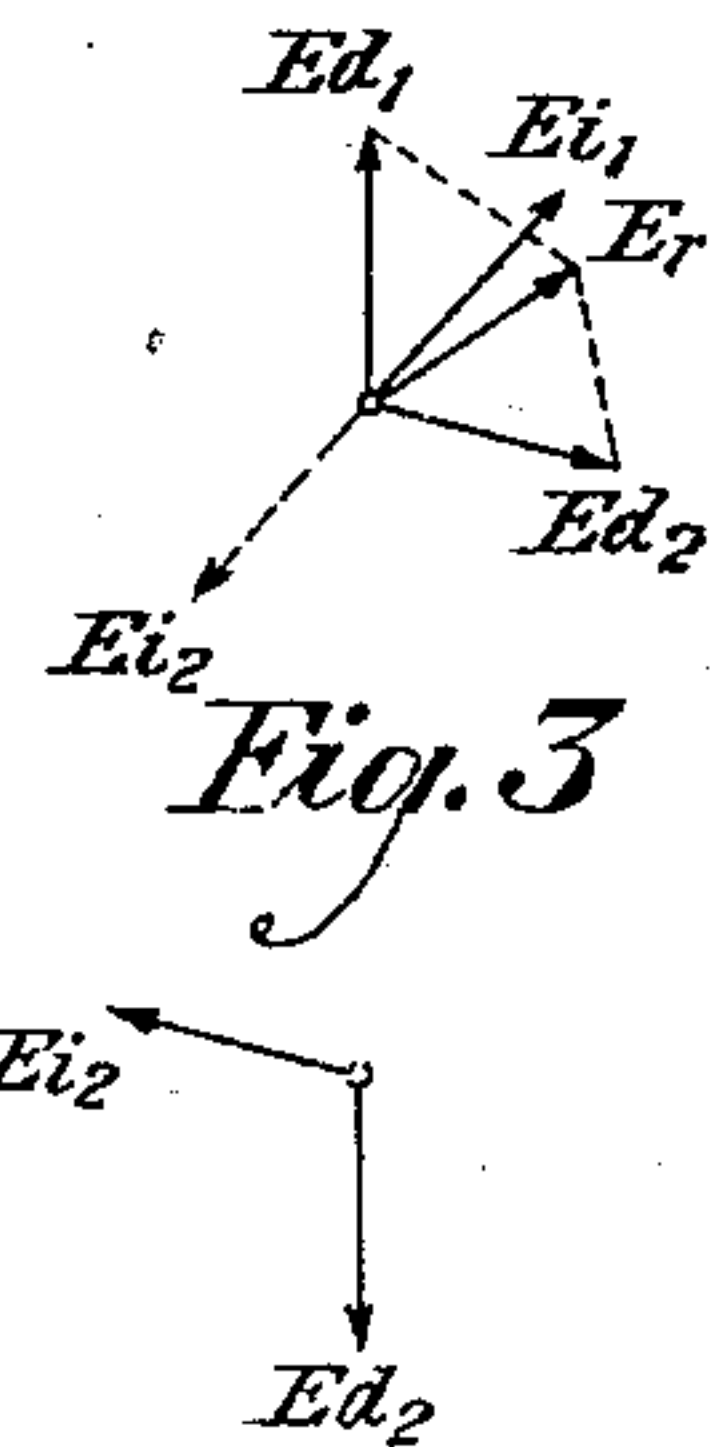


Fig. 3

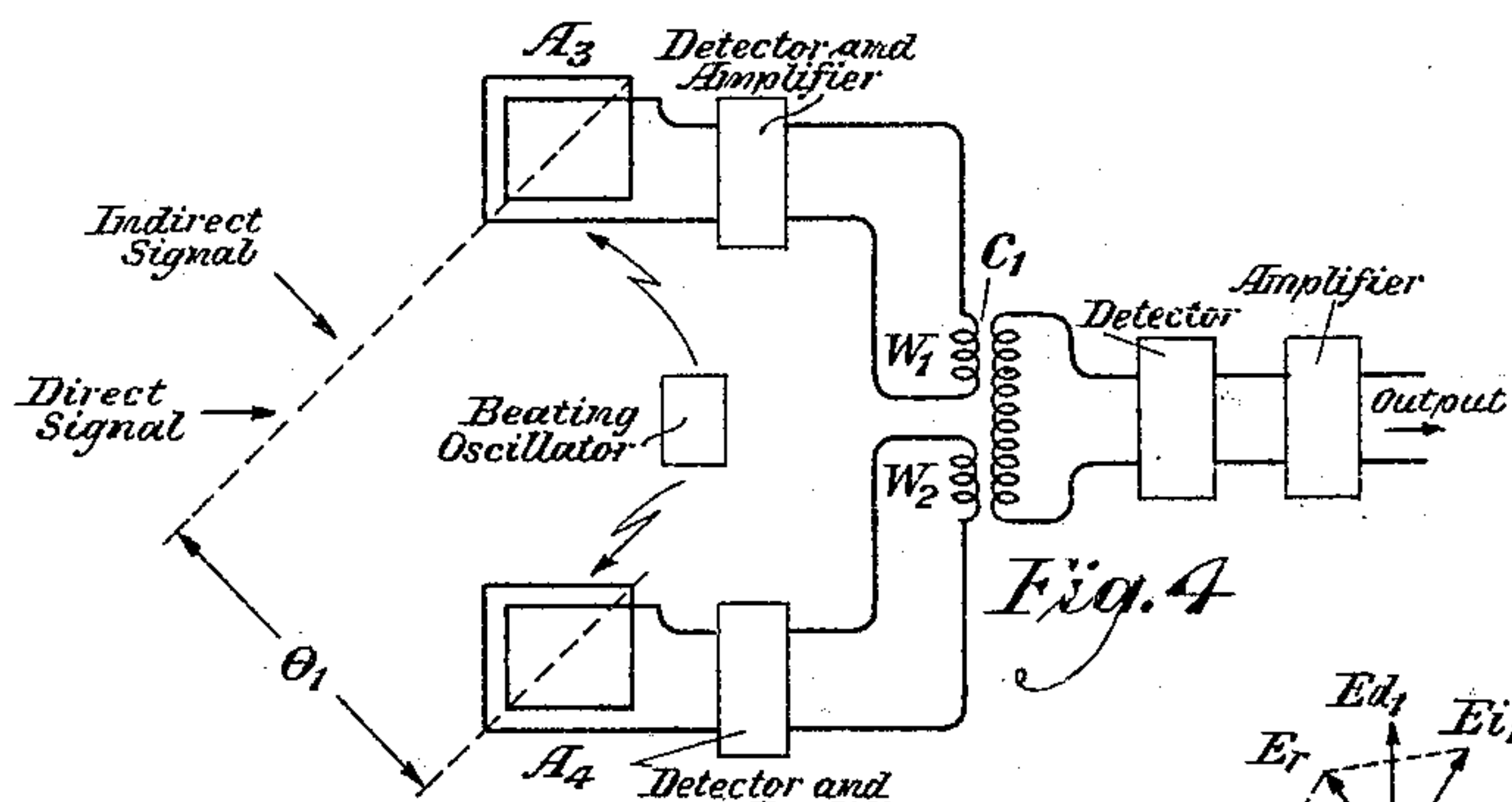


Fig. 4

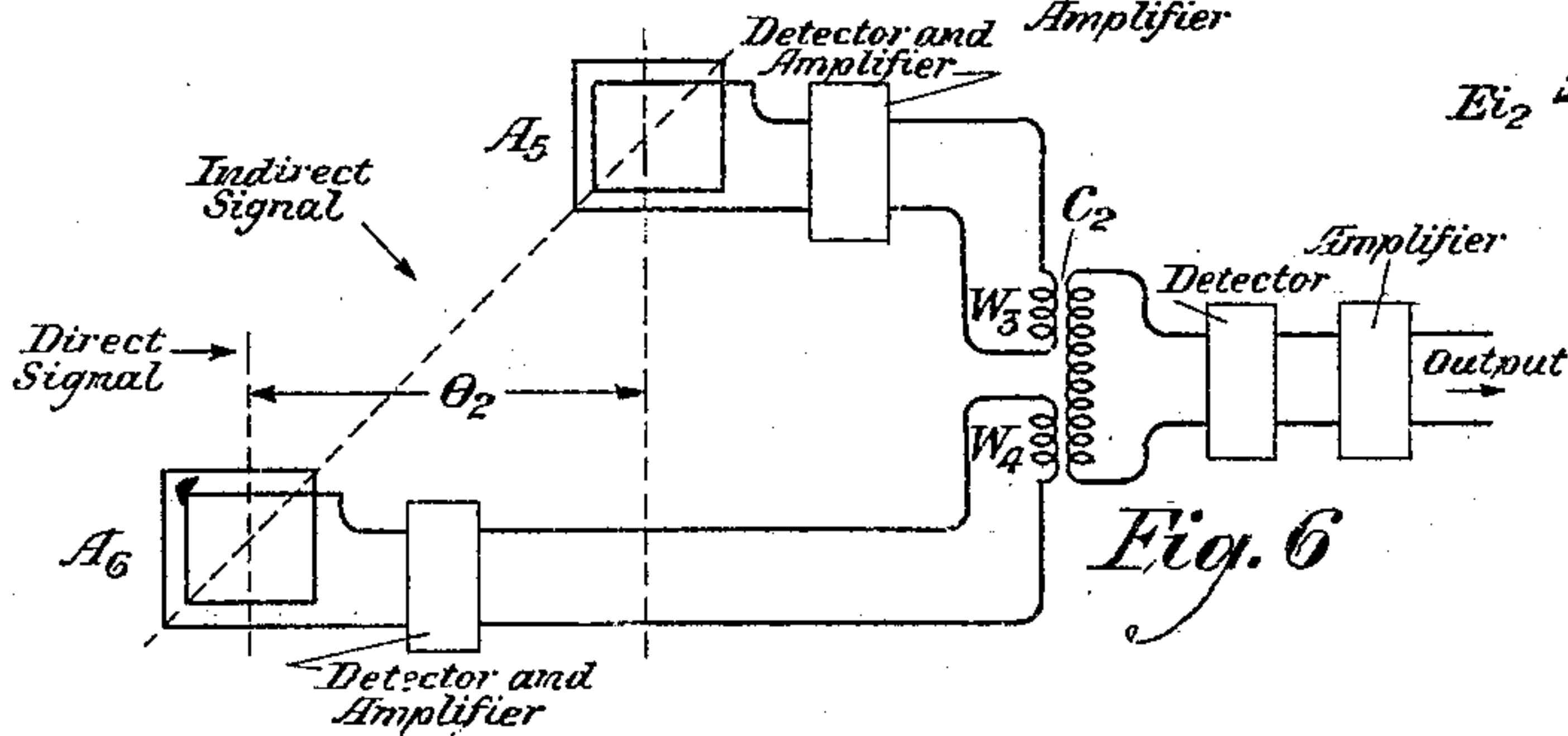


Fig. 6

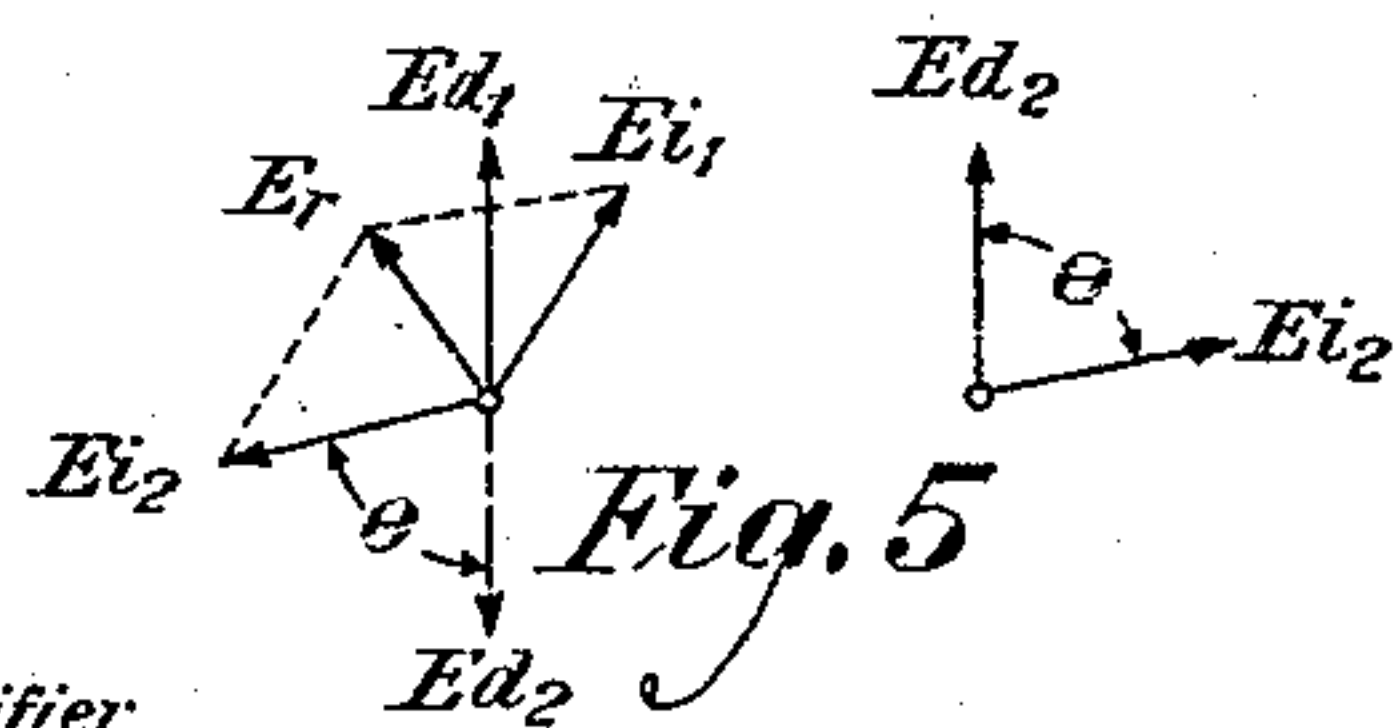


Fig. 5

INVENTOR
R. K. Potter
BY *JEY*
ATTORNEY

UNITED STATES PATENT OFFICE

RALPH KIMBALL POTTER, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK



RADIO RECEIVING CIRCUIT

Original application filed December 4, 1926, Serial No. 152,659. Divided and this application filed September 20, 1928. Serial No. 307,168.

This application is a division of my co-pending application filed December 4, 1926, and given Serial Number 152,659.

This invention relates to radio receiving circuits, and more particularly to methods of and means for overcoming fading effects in radio reception.

It has been discovered that in night-time transmission of radio signals, at least at the wave lengths used in broadcasting, the signals sent from a point of transmission to any point of reception follow at least two major paths. One of these paths is a direct path between the transmitter and the receiver, while the other path is devious and apparently of considerably greater length than the direct path. It appears further that these two major paths are in a common vertical plane between the transmitter and the receiver, and that the direct and indirect signal energy components received at the distant point combine at a space angle in this plane.

It is the object of my invention to overcome the fading effects due to the existence of these two major transmission paths, and thus to provide for satisfactory reception during the periods when such fading is observed with the ordinary receiving system.

In general, I accomplish the desired result by establishing two receiving points in a

follow both a direct path and an indirect path between the point of transmission and a point of reception and indicates one desirable position of the two receivers;

Fig. 2 shows diagrammatically one arrangement of the receivers and associated circuits;

Fig. 3 comprises two vector diagrams indicating the phase relations of Fig. 2;

Fig. 4 shows diagrammatically a second arrangement of the receivers and associated circuits;

Fig. 5 shows by means of vector diagrams the phase relations of Fig. 4, and

Fig. 6 shows diagrammatically a third arrangement of the receivers and associated circuits.

Fig. 1 of the drawing illustrates schematically and approximately the condition of night-time transmission discussed above. If two radio receivers R_1 and R_2 are placed in a common vertical plane with the transmitter T , the two receivers having a considerable horizontal separation, radio signals sent from T will reach the receivers R_1 and R_2 over a direct path DP . Also, the signals will reach the receiver R_1 over some such path as IP_1 and the receiver R_2 over some such path as IP_2 . The horizontal separation of the two receivers may be made such that the signals received at the two points over either the direct or the indirect path

tical plane between the point of transmission and any point of reception, two radio receivers substantially in a common vertical plane with the point of transmission, said receivers being separated one from another by a distance such that the signals received in the two receivers over the one path will be completely out of phase and the signals received over the other path will have a positive vector sum.

6. A system for receiving radio signals of a given frequency which follow both a direct path and an indirect path in a single vertical plane between the point of transmission and any point of reception, said system comprising two radio receivers substantially in a common vertical plane with the point of transmission, said receivers being separated one from another by a distance such that the signals received in the two receivers over the one path will be completely out of phase and the signals received over the other path will have a positive vector sum, means for combining the outputs of the two receivers, a detector, and means for impressing the combined output thereon.

7. In a system for receiving radio signals of a given frequency which follow both a direct path and an indirect path in a single vertical plane between the point of transmission and any point of reception, two radio receivers substantially in a common vertical plane with the point of transmission, said receivers being separated one from another by a distance such that the signals received in the two receivers over the one path will be completely in phase and the signals received over the other path will be completely out of phase.

8. A system for receiving radio signals of a given frequency which follow both a direct path and an indirect path in a single vertical plane between the point of transmission and any point of reception, said system comprising two radio receivers substantially in a common vertical plane with the point of transmission, said receivers being separated one from another by a distance such that the signals received in the two receivers over the one path will be completely in phase, and the signals received over the other path will be completely out of phase, means for combining the outputs of the two receivers, a detector, and means for impressing the combined output thereon.

In testimony whereof I have signed my name to this specification this 14th day of September 1928.

RALPH KIMBALL POTTER.

