

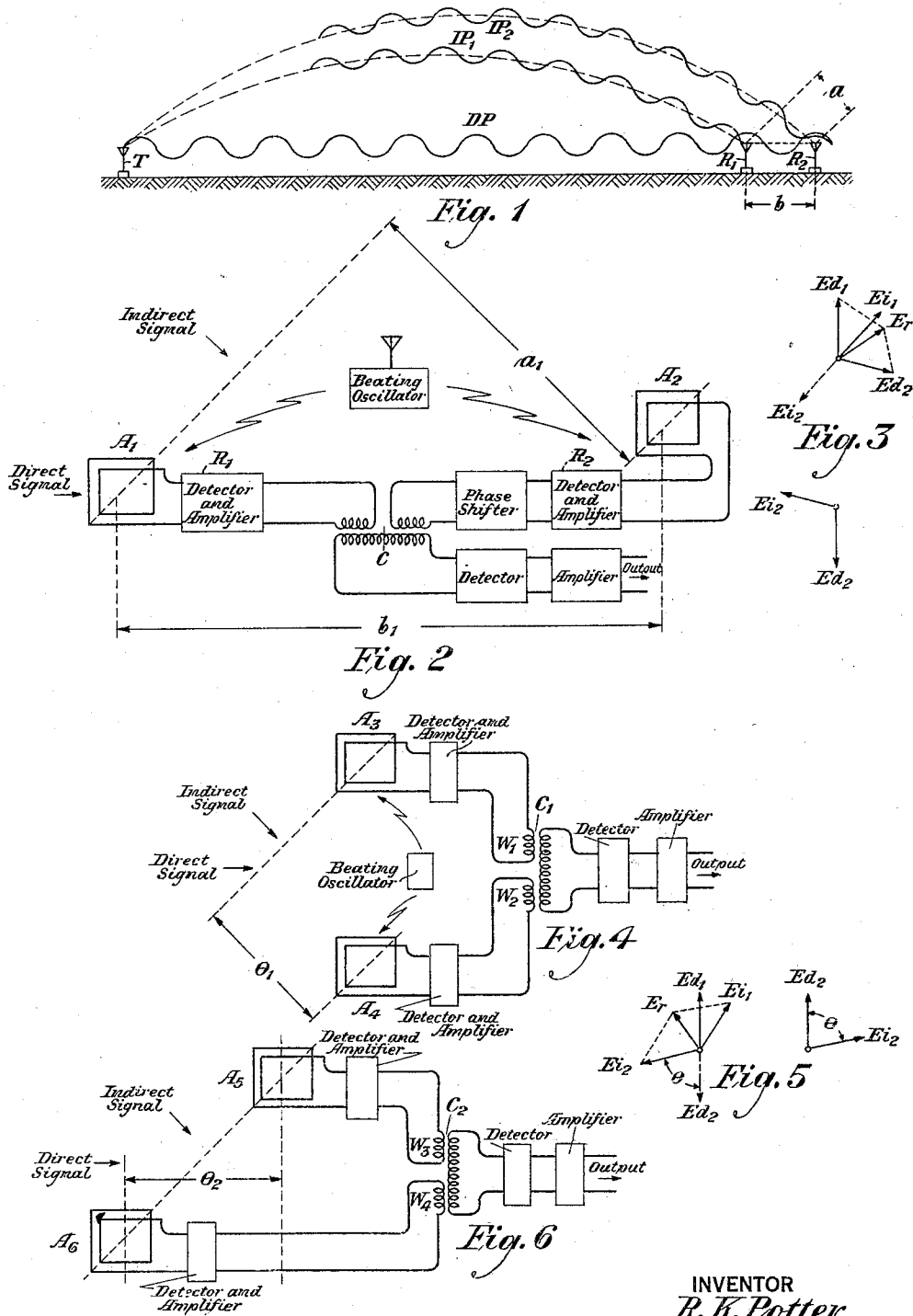
March 3, 1931.

R. K. POTTER

1,794,418

RADIO RECEIVING CIRCUIT

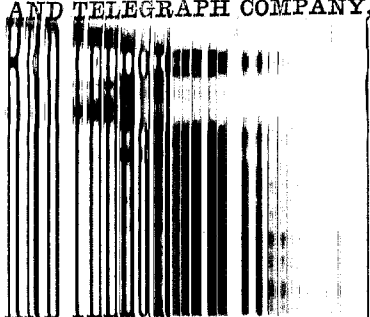
Original Filed Dec. 4, 1926



INVENTOR
R. K. Potter
 BY *gc*
 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 sig-
nals 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 re-
ceiver, 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 dis-
tant point combine at a space angle in this
plane.

It is the object of my invention to over-
come 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 ob-
served with the ordinary receiving system.

In general, I accomplish the desired result
by establishing two receiving points in a
common vertical plane with the point of

transmission, and so that the signals may
follow both a direct path and an indirect
path between the point of transmission and
a point of reception and indicates one de-
sirable position of the two receivers;

Fig. 2 shows diagrammatically one ar-
rangement of the receivers and associated
circuits;

Fig. 3 comprises two vector diagrams in-
dicating 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 ar-
rangement of the receivers and associated
circuits.

Fig. 1 of the drawing illustrates schemati-
cally 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 trans-
mitter T , the two receivers having a con-
siderable 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 separa-
tion 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.

