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No. 771,819.

PATENTED OCT. 11, 1904.

L. DE FOREST.
WIRELESS SIGNALING APPARATUS.
APPLICATION FILED MAY 28, 1904.

NO MODEL.

Fig. 1.

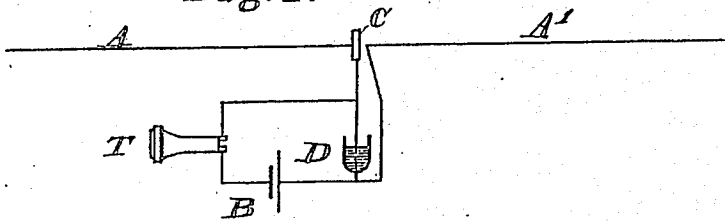


Fig. 2.

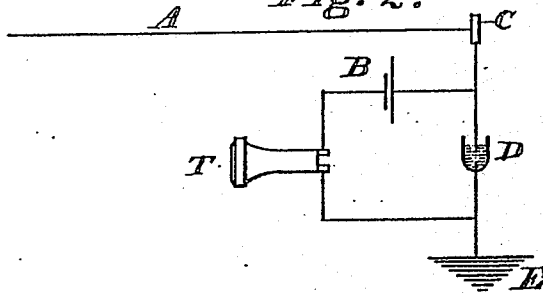
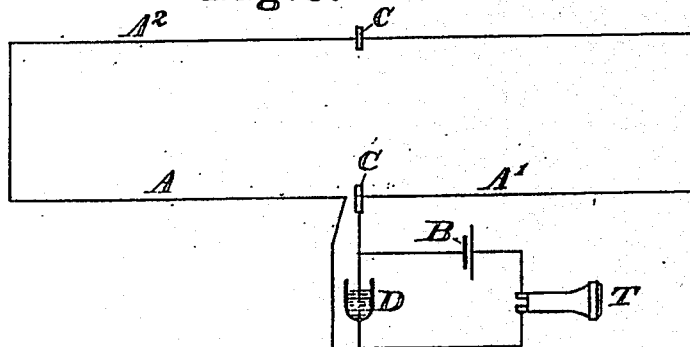


Fig. 3.



WITNESSES:

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WIRELESS SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 771,819, dated October 11, 1904.

Application filed May 28, 1904. Serial No. 210,155. (No model.)

To all whom it may concern:

Be it known that I, LEE DE FOREST, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Wireless Signaling Apparatus, of which the following is a specification.

My invention relates to apparatus and devices for localizing or determining the direction of a station which is emitting wireless signaling-waves.

The object of my invention is to improve and simplify such devices.

The scope of my invention will be defined in the claims.

The drawings show my invention embodied in forms now preferred by me.

Figures 1, 2, and 3 each shows a receiving apparatus embodying my invention.

I have discovered that if a horizontal conductor be mounted to swing about a vertical axis and a wave-sensitive device be placed in series with said conductor and the earth or other capacity or in series with two parts of the same conductor the received signal-waves produce currents in said conductor which vary in strength according as the position of the wires approach or depart from a position of parallelism with the direction of travel of the waves. By employing as the wave-sensitive device one in which the intensity of indication varies as the intensity of the current the position of maximum and minimum effect may be determined from which the direction to the source of the waves may be told.

In Fig. 1 I have shown a horizontal conductor divided into two parts A A', one being a continuation of the other, and a wave-sensitive member D interposed in series between these two parts. This conductor is mounted to swing upon a pivot C, so that it may be swung about a vertical axis. Mechanism of any suitable form for making manifest the changes produced in said wave-sensitive device are provided. As shown, this consists of a local circuit containing battery B and telephone-receiver T. Any other suitable devices may be employed for this purpose.

In Fig. 2 I have shown the pivot C as at one end of the horizontal conductor A and the

wave-sensitive device D in series between this conductor and the earth or other capacity E.

In Fig. 3 I have shown a device like that of Fig. 1, except that I have made a direct connection between the extremities of the two parts A and A' of the collecting-conductor, thus forming a closed circuit containing therein the wave-sensitive member D. This return connection A' need not be separated any great distance from the parts A' and A'', but may, if desired, be somewhat separated therefrom. In any event I prefer that the horizontal component be much the greater of the two, as this is what I principally rely upon in the arrangement for producing the desired effect.

It is not necessary that the collecting-conductor be proportioned to the wave length. In fact, considerations of convenience and practical operations will limit their length. I have also found that a great length of conductor is not necessary in order to secure satisfactory results sufficient for the practical needs of most cases. As the waves progress along the conductor variations of potential are produced therein, which variations are communicated to the wave-sensitive member and produce indications which when varied by swinging the horizontal conductor enable the direction of the transmitting-station to be judged.

In the operation of the device as herein shown the maximum indication will be obtained when the direction of the collecting-conductor corresponds with the direction of propagation of the signal-waves and the minimum indication at ninety degrees from this.

The apparatus shown is only given as illustrative of my invention and not with the idea that other forms of apparatus may not be used in carrying out my invention. I do not therefore limit my invention to the apparatus shown, but define the scope of my invention by the terms of the claims.

I claim—

1. A localizer of the source of wireless signaling-waves comprising a conductor having its principal component extending horizontally and short as compared with one-quarter wave length of the received waves, means for turning said conductor about a vertical pivot,

and an electrical translating device associated with said conductor.

2. A localizer of wireless signaling-waves comprising a horizontal conductor short as compared with a quarter of the length of the received waves, and mounted to be swung about a vertical axis, and an electrical translating mechanism associated therewith.

3. A localizer of the source of wireless signaling-waves comprising a horizontal conductor having a length independent of the wave length of the signaling-waves and mounted to be swung about a vertical axis, and an electrical translating mechanism associated therewith.

4. A closed-circuit receiving-conductor having a length independent of the wave length of the signaling-waves and mounted to swing about a vertical axis and having a wave-sensitive member inserted therein, and means for making manifest the variations produced in said wave-sensitive member.

In testimony whereof I have hereunto affixed my signature, this 25th day of May, 1904, in the presence of two witnesses.

LEE DE FOREST.

Witnesses:

H. L. REYNOLDS,
ALPHONSO HOWE.