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AERIAL SYSTEMS FOR RADIO BEACONS  
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x Fig. 1

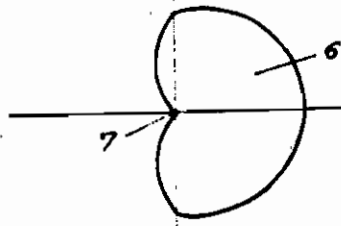
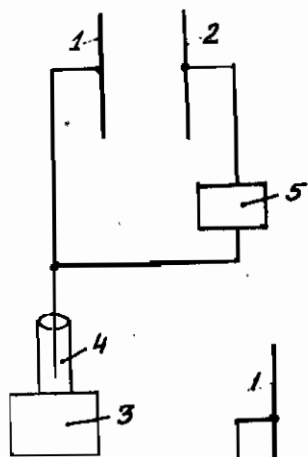


Fig. 3



x' Fig. 2

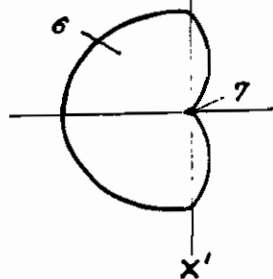


Fig. 4

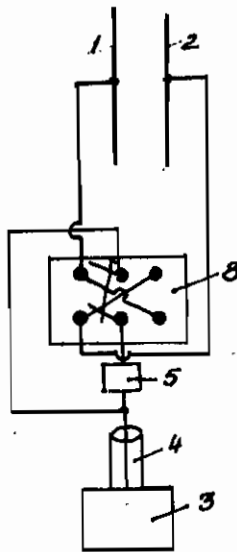
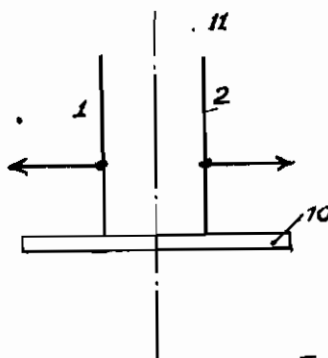


Fig. 5



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# ALIEN PROPERTY CUSTODIAN

## AERIAL SYSTEMS FOR RADIO BEACONS

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This invention relates to improvements in aerial systems for radio beacons.

It relates more particularly to an aerial system for radio beacons which permits to carry into effect a well known method of radio direction finding.

In the known aerial systems for radio beacons it is necessary that the distance between the three aerials insuring the transmission of the radio-electric waves in a preferential direction is equal to a quarter of the wave length, which offers the disadvantage to require a cumbersome device which can be mounted only with difficulty on a rotating plate for the obtention of a rotating beam.

Furthermore, these systems require the use of at least three aerials.

The present invention has for its object to remedy to these disadvantages and to provide a device with two aerials which are set very close together, the said device permitting to obtain a radiation in a preferential direction and in a given range of frequencies.

On the other hand, the known aerial systems for radio beacons necessitate a fourth aerial for the obtention of a circular radiating beam, which still increases the space required by the system and the cost of the latter.

Another object of the present invention is also to do away with this disadvantage by providing an aerial system for radio beacons which necessitates no special aerial for the circular radiating beam.

An improved aerial system for radio beacon permitting to attain the above mentioned objects possesses the characteristic features which result from the following description and especially from the appended claims.

Systems made according to the invention are shown diagrammatically in the appended drawing, in which:

Figures 1 and 2 are radiation diagrams of the system;

Figures 3 and 4 are diagrams of the system, and

Figure 5 is a view of a system for the obtention of a rotating radiation.

The diagram of Figure 3 comprises an aerial 1 which is supplied directly by the transmitting station 3 by means of a feeder 4.

An aerial 2 is supplied by the same transmitting station 3 by means of the feeder 4 and of a phase shifting box 5 so that the feeding voltage of this aerial is shifted in phase by a certain value with respect to that of the other aerial.

The operation of the device is identical to that

of the device which is generally used for the obtention of the radiation diagram working in a preferential direction and in which a system of two aerials is used which are spaced from another by a quarter of a wave length, this spacing effecting the difference of course giving the phase shifting which is necessary for the operation of the system and permitting to obtain the radiation diagrams of Figures 1 and 2.

This phase shifting obtained by a difference of course is effected, in the device according to the invention, through a phase shifting circuit which permits by adjusting the phase in a convenient manner to set the aerials at any distance from another. Thus a radiation diagram with a radiation in a plane shown by the cardioid 6 is obtained, the axis of the aerials being at 7.

This device permits to easily carry out all the combinations which are necessary for the operation of apparatuses such as rotating radio beacons or beaconing devices for a channel, namely:

- (1°) Reversing of the direction of radiation;
- (2°) Obtention of a rotating radiation beam;
- (3°) Obtention of a circular radiation.

The direction of the radiation is obtained by reversing the feeding of the aerials 1 and 2.

The aerial 1 is then supplied through the medium of the phase shifting circuit 5 and the aerial 2 is supplied directly. For carrying out this operation one may provide a reversing switch 8 which effects the changes of connections which are necessary for directing the radiating beam sometimes in a direction and sometimes in the other, by reversing the supply or feeding of the aerials.

For obtaining a rotating directional radiation beam the conveniently supplied aerials are mounted on a plate 10 revolving about an axis 11.

The rotation of this plate 10 effects the rotation of the directional radiating beam.

This system offers the advantage that it can be mounted on a plate of small dimensions since the aerials can be very close to another contrary to the known systems where the distance between both aerials must be equal to a quarter of a wave length.

A circular radiating beam is obtained by feeding the aerials 1 and 2 in phase.

Since these aerials 1 and 2 are set at a small distance from another, they form a unit which is equivalent to a single aerial and thus radiate equally in all the directions.

With respect to the known systems this device offers the advantage that it requires no special aerial for obtaining the circular radiation.

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