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TRANSMITTING ARRANGEMENT FOR
AEROPLANE NAVIGATION
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Fig.1

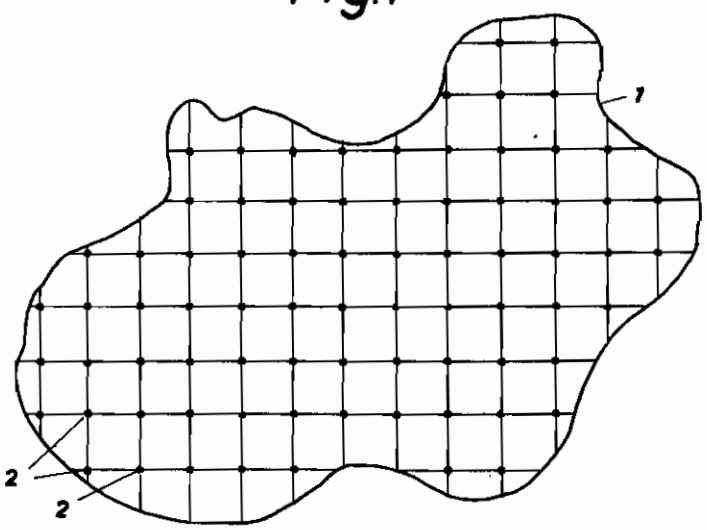
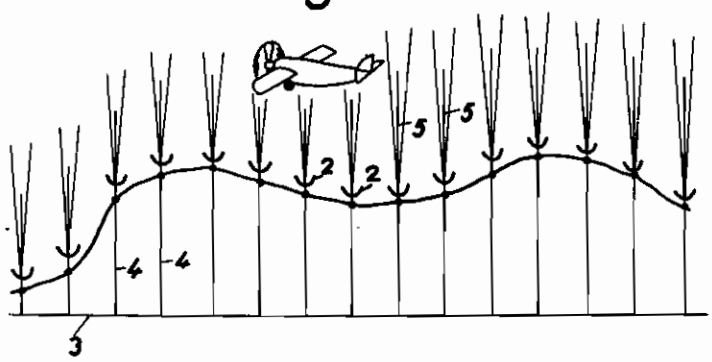


Fig.2



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ALIEN PROPERTY CUSTODIAN

TRANSMITTING ARRANGEMENT FOR AEROPLANE NAVIGATION

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Air traffic is often endangered by the fact that the visibility of the surface of the earth is rendered bad or quite impossible by fog, rain, or darkness. Therefore, it is endeavoured since long to develop devices enabling to fly blindly, i. e. independent of weather conditions, etc. Apart from finding the way, it is particularly important for the pilot of the aeroplane to know the height at which he is flying.

In order to determine the height of the aeroplane, it has been proposed to radiate from the aeroplane some kind of electric or other waves towards the surface of the earth and to use the period which has elapsed between the transmitting and the return of the waves for indicating the height. Furthermore, it has been proposed, for keeping the correct height in landing, to arrange landmarks establishing a straight or curved line in space, which line the aeroplane is able to follow with suitable receiving devices.

Contrary thereto, the present invention relates to another manner of facilitating the correct conduction of the aeroplanes and at the same time giving information with respect to the height at which the aeroplane is flying.

For this purpose, the invention proposes to equip the entire traffic area with small transmitters radiating substantially in upward direction, and to let these transmitters give certain informations by special signals or by modulation or by language, informing the pilot about the respective local conditions, the height at which the transmitter is arranged, the position with respect to other transmitters in the neighbourhood, or about the degree of geographical longitude or latitude. If the transmitters are always operated with the same energy, the height may be determined by using the intensity of the radiation in upward direction as a measure for the height above the surface of the earth. If it is also known, by the signal of the respective transmitter, from what height this transmitter is radiating, these two data together enable to also determine the absolute height.

In the accompanying drawing, Fig. 1 illustrates a larger area equipped with a number of transmitters 2 which may, for example, be placed in the points of intersection of an imagined geographical survey. These individual transmitters thus represent various wireless beacons which, however, contrary to the hitherto used wireless beacons, are not arranged along a way to be followed, but are uniformly distributed over the entire area. Of course, it is possible to mark them in a special manner so that the reception of only one signal or of two neighbouring signals will be sufficient for the aeroplane to exactly determine its position.

Fig. 2 shows the arrangement of the bearing transmitter 2 in vertical relation. 3 is a reference of surface altitude, for example mean sea level. Then, 4 are the individual absolute altitudes of the transmitters 2, radiating a cone of rays 5 in upward direction. These rays 5 will then possess, as mentioned above, a distinguishing mark giving the respective information about the absolute altitude of the transmitter. Now, the aeroplane may be provided in a simple manner with devices which make it possible for the aeroplane to be kept more or less automatically at a definite altitude above the surface of the earth or, in case of suddenly occurring unevennesses of the surface, at a definite absolute altitude. Apart from being kept at a definite altitude, the aeroplane may also be given beforehand the exact direction to be followed. Of course, this may be effected most simply by stating the call signals or distinguishing marks of the transmitters to be passed on the way, or also automatically by corresponding bearing devices forcing the aeroplane without external action by the pilot to fly towards the transmitter to which the bearing devices are set, and upon reaching of which the bearing is automatically adjusted to the next suitable transmitter.

Moreover, the new arrangement of transmitters may also be used advantageously in the landing of an aeroplane. For this purpose, the pilot just has to fly in a direction easily defined by successively arranged suitable transmitters and may then, with the aid of a simple intensity observation, adjust the most favourable inclination of the plane of flight and in this way safely descend right to the actual landing.

The new special arrangement, therefore, provides a very easy and clear way of finding the position, prevents collisions with sudden elevations of the ground, enables to maintain a definite relative or absolute altitude of flight, and finally makes it possible to land at any desired place and to follow any desired direction. The proposed arrangement of transmitters is not at all expensive, since the transmitters employed only need to possess a very small capacity. Accordingly, the largest possible number of transmitters will be uniformly distributed over the entire area.

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