

effort of thought, they will be convinced. Perhaps there might be, alas! by that time, a few more collisions, a few more ships run aground in narrow channels or run ashore by foggy weather or by a dark night. It is to be feared, and it is that which rouses human conscience. To have done everything so that this should no longer happen, to think that these crimes of the sea should no longer be possible and see that nevertheless they are allowed to take place! At Rouen, a year ago, I told M. Rio, Under-Secretary of State, that the secret of those who discover is, to wish to render a service, and I added that great inventions come from the heart. I might say that the same state of mind is as indispensable for rapidly realising discoveries or new inventions. As for us, our part ends there, where the part of those who must realise the inventions, begins?

By what genesis of the subconsciousness, independent, at the beginning, of any will, did this idea of guiding arise, grow, become precised and did it lead to the whole system which you know now? I think all is explained when I tell you that as a child I saw, on the coasts of Brittany and Normandy, so many sailors set out who have never returned! I think that all becomes clear, when I remember having seen, weeping, the wives and children of those who left for us, who remained behind. I recollect having said to myself that this injustice must not be, and solemnly declared to myself that it should no longer occur. Thus, this problem, little by little, set itself before me, ever present in my mind along the years of youth: Cause those who set out, to return! Each new catastrophe hastened our efforts and multiplied our work. Alas, the end so noble appeared distant, fugitive, and however, always tempting, as the mirage withdraws itself at each advance. And, now, it is realised and to-day we experience that sweet joy, to be able to say that these crimes of the sea shall never occur again, never! Doubtless, the ship might break asunder and the aeroplane might crash, but that does not depend on us; our task is accomplished, and, besides, these disasters are so rare!

I can tell you also, that it is the constant thought of your life and perils, you navigators of the sea and the air, that has always sustained us in our continuous and tenacious efforts. May this discovery, which our efforts joyously give you, cause those of you who depart henceforth, to set out having in your hearts the certainty of joyful homeward returns; may this invention also bring a little comfort to the hearts of the wives and children who, up to now, awaited your return, in anxiety, uncertainty and in tears.

CHAIRMAN (MR. FREDK. R. SIMMS):

We have listened to a most interesting lecture, and I have much pleasure in calling upon some gentleman to open the discussion.

## DISCUSSION.

CAPTAIN SAYERS.—Mr. Loth's leader cable system has attracted singularly little attention in this country as far as I can gather, and it seems to me that the

reason for this is that as a route-marking device it has certain disadvantages, as, for instance, it entails the restriction of all traffic on a given route to a very narrow strip. I should think that ordinary wireless apparatus would give just as good results so far as route finding is concerned, with the added advantage that it may be used for issuing traffic control orders.

There is one point regarding which Mr. Loth's system would undoubtedly be of use, and that is, in giving the pilot a precise indication of the position of the aerodrome, and it seems to me that all that would be necessary in addition to direction finding wireless would be a guide cable round each aerodrome on to which incoming machines could be directed by the traffic control at the aerodrome.

MR. MANNING.—I am rather ignorant on electrical matters, especially of this description, and all I can say is to ask questions. I should like to know what is the weight of the apparatus to be carried, as that is very important. I was also much interested in the possibility of determining the height of the aeroplane over the cable. If that could be done with accuracy it might be very useful for testing aircraft. Is it possible to ascertain the height accurately?

MAJOR LEFROY.—I do not agree with the suggestion that the leader cable emits actual radiations, or, if it does, the frequency would be so low that radiation must be very small indeed. Any appreciable signals received, therefore, would be purely inductive effects. I should like to add that we in this country are fully acquainted with M. Loth's system, but do not consider it so satisfactory a way of dealing with the guiding of aircraft as the usual D.F. wireless.

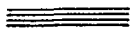
Messrs. Gray and Loth, in replying to the discussion, stated that the weight of the receiving equipment was 15 kgs. (33 lbs.), and that the same apparatus could be used for the reception of ordinary wireless signals. Reception of ordinary signals was possible up to 15 kms. (10 miles), from the leader cable, and determinations of height to an accuracy of about five metres was possible at small altitudes.

The signals received were due to radiation, and not, as Major Lefroy had suggested, to direct induction. It had been proved that an ordinary twisted pair of telephone lines in the immediate vicinity of the experimental lines at Villacoublay and elsewhere were not adversely affected.

A hearty vote of thanks to Messrs. Loth and Gray for a very interesting paper was passed with acclamation, and the meeting then closed.

## DESCRIPTION OF THE ILLUSTRATIONS.

- Fig. 1 shows a cable supported on poles, an alternating current being generated in it by the alternator shown on the left.
- Fig. 2 shows a submarine cable operating on a similar principle, but the return being made through the water instead of through the earth.
- Fig. 3 shows lines representing the shape of the magnetic field surrounding the cable. The crosses represent the coils of the detector circuit mounted on an aircraft.
- Fig. 4 shows the manner in which a pilot is made aware of his approach to a hill.
- Fig. 5 shows in plan the form of the magnetic field caused by the magnetos, generators, etc., of an aircraft.
- Fig. 6 shows the field in front elevation.
- Fig. 7 indicates how a small coil placed near the source of the disturbance, i.e., in the vicinity of the magnetos, may be used for opposing the effects in one of the large coils of the receiving circuit of a magneto disturbance.
- Fig. 8 indicates the analysis of a route between two points A and B.
- Fig. 9 shows a receiver installation on an aircraft.
- Fig. 10 shows a portion of the guide cable surrounding the Villacoublay Aerodrome.



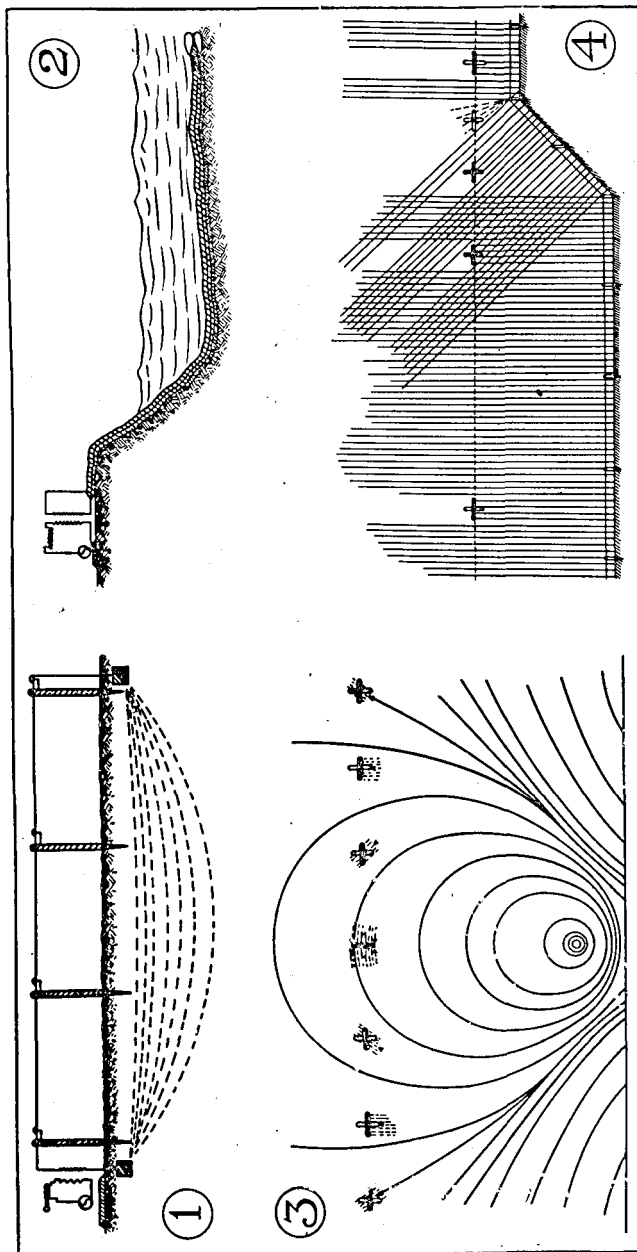
**LINES OF FORCE**



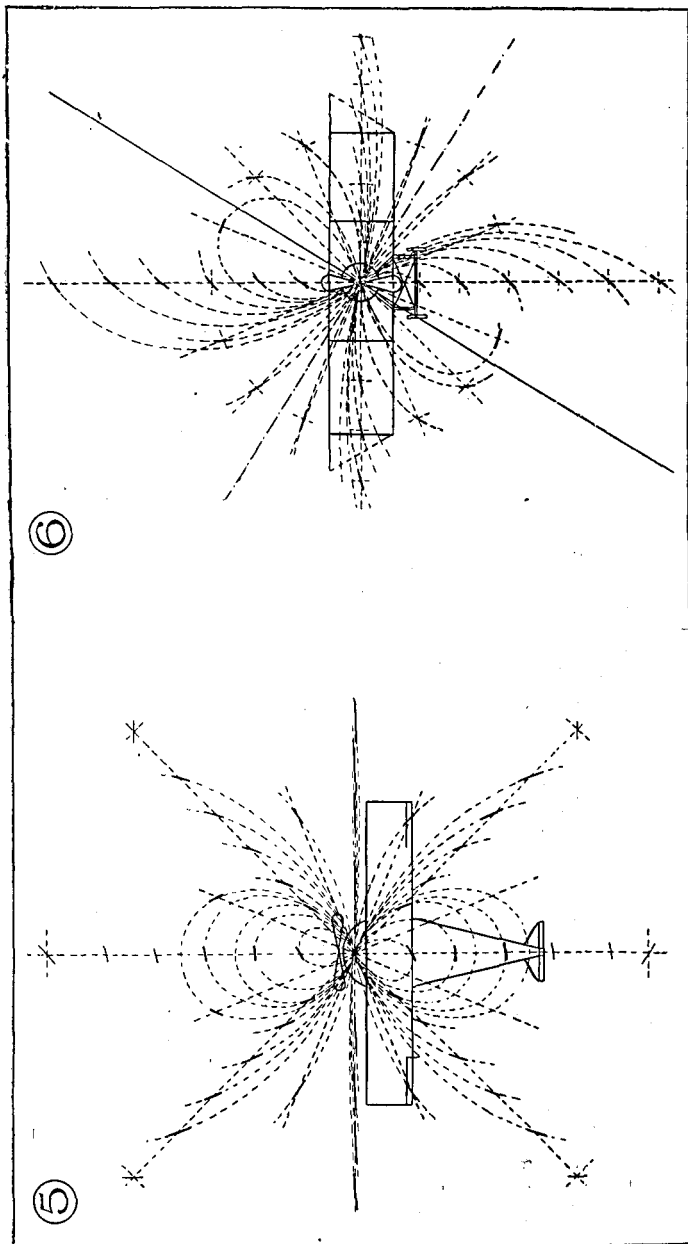
**RECEPTION NULL AT THE FRAME**



**RECEPTION AT THE FRAME**



THE LOTH LEADER CABLE SYSTEM FOR



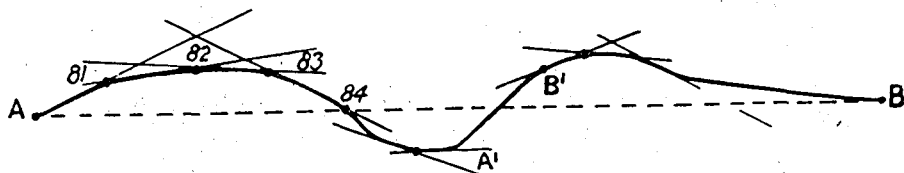
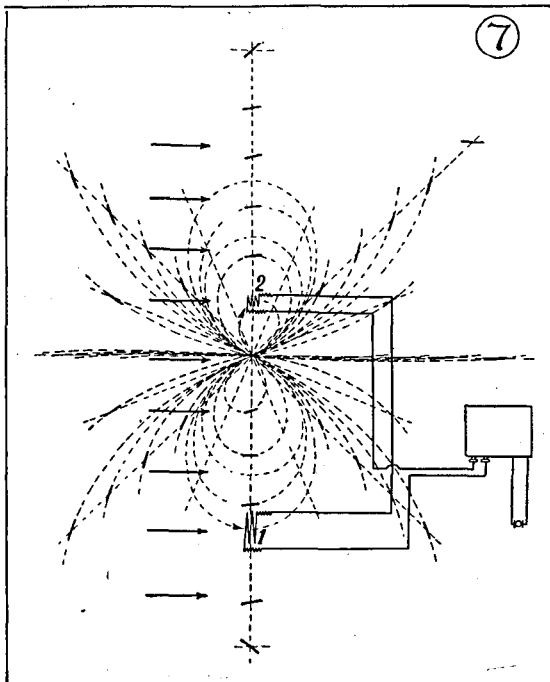


Fig. 8.



FIG. 10.

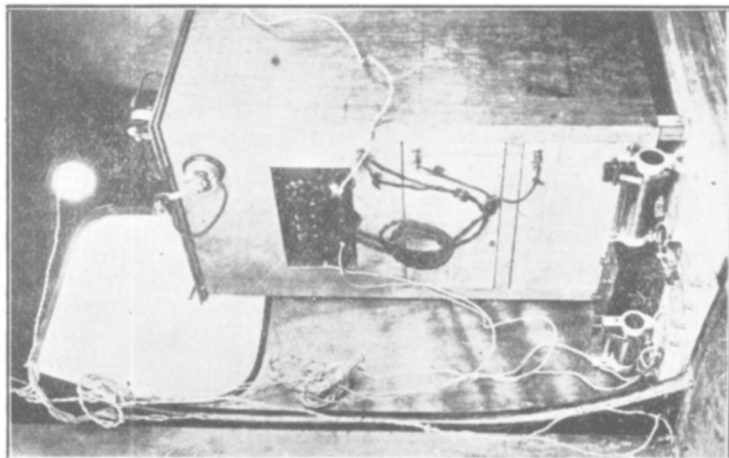


FIG. 9.