An Electric Speed and Direction Indicator for Trans-Atlantic Planes

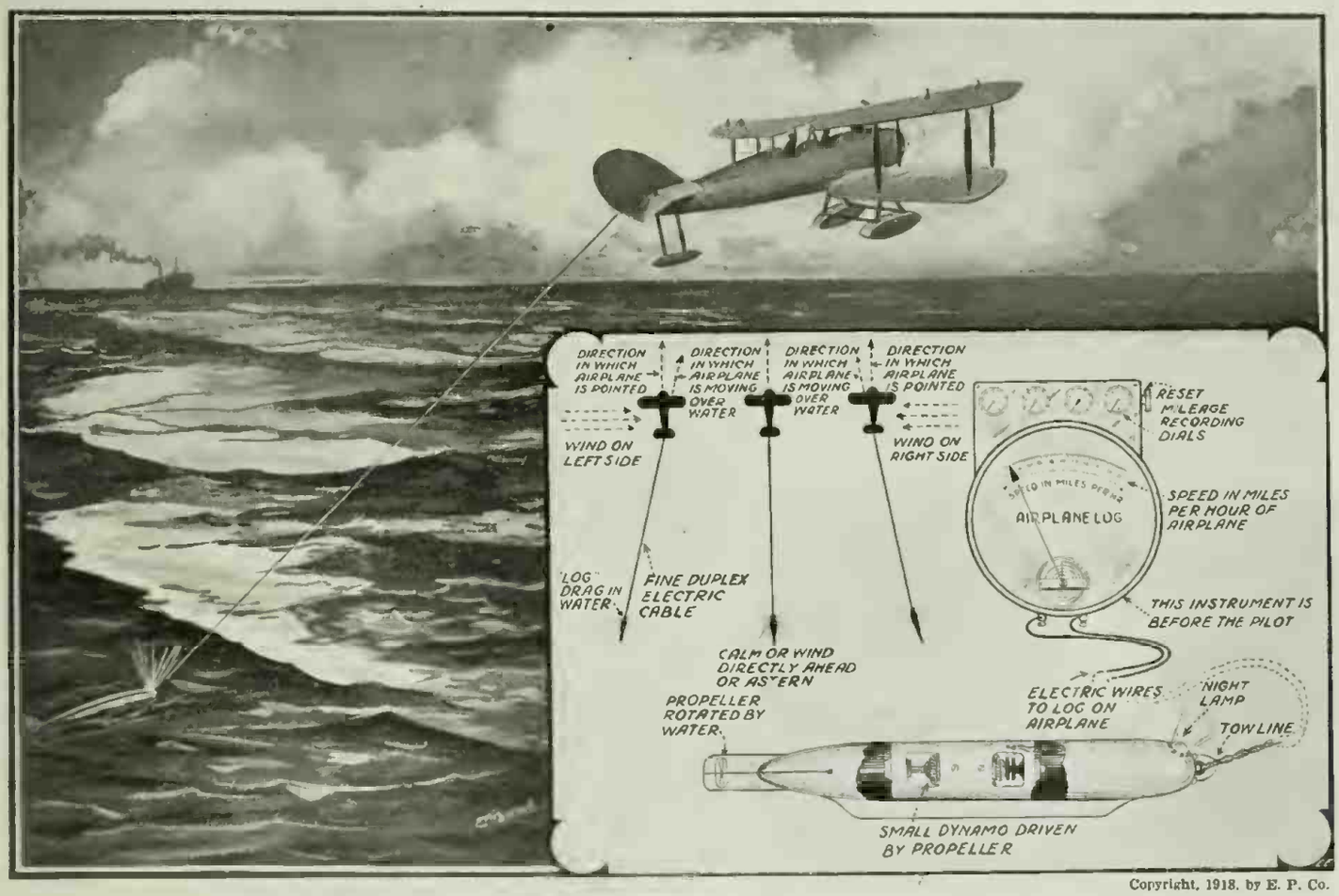
IT is easy enough to read of making a Trans-Atlantic aeroplane flight, but when it comes down to actually making such a trip, no one but an experienced aviator, or one who has studied the subject very closely, can imagine just what this means. In the first place, the layman thinks mostly in terms of horsepower and wing surface, and he argues: Given sufficient of these two quantities and a good pilot, there should be no trouble at all to fly across the Atlantic Ocean at its greatest breadth, of say three thousand miles or more. But he forgets one thing, and that is, that it is almost impossible for an aviator, no matter how experienced or well traveled he may be, to steer a course across such a vast expanse of water as the Atlantic Ocean, for he cannot check his route by any familiar or well-known land-marks; and even when using the latest scientific apparatus, such as the Sperry Synchronized Drift Set, which utilizes the wave movement or a succession of movements to warn the aviator how his machine is being drifted or forced sidewise from the desired course, he would be at a loss to utilize such an instrument whenever the visibility happened to be low, and particularly when low-flying clouds or mists were encountered, which would cut off his view of the underlying water. The same problem would confront him during night flying, especially when the moon happened to be obscured.

and again—the wave crests might easily be very choppy, and have a more or less confused movement due to freakish air currents, and these would make it difficult indeed, if not impossible, for the pilot to accurately establish the true course of his flight in relation to the earth itself.

Therefore, inventors and aviators interested in such long flights as these have busied themselves with the devising of other schemes and methods which would make it possible in a Trans-Atlantic trip for the pilot to check up his course of flight with the greatest accuracy possible. What aviation engineers conceive to be one of the best solutions of this problem appears to be that recently suggested by Rear Admiral Bradley A. Fiske of New York. His proposition is illustrated herewith and involves the towing of a small floating body thru the water by an aeroplane. This plan kills three birds with one stone, for it, among other things, enables the distance covered in miles or kilometers to be recorded in the same manner as a ship's mechanical log; tallies the mileage covered each day, and also it provides physical contact with the earth, and supplies a visible index of the exact influence of air currents in forcing the aeroplane laterally from its intended compass course, besides indicating the speed in miles per hour. By Admiral Fiske's plan, the aeroplane would fly about 100 feet above the water. The first part of his proposition specifies that for long flights over water, an aeroplane should be made to steer as straight a course as possible, not only laterally, but also vertically. Thus we come to what we may call the "aeroplane log."

This is illustrated in detail, as also in actual use by an aeroplane in flight, in the accompanying illustration. Among other things, as Admiral Fiske has pointed out, the most important information that the aërial pilot needs to know, is not only the length of the flight, but the *direction of flight*, and this latter all-important quantity can be easily found by simply towing or hauling thru the water a small torpedo-shaped object such as the "aeroplane log" here illustrated. This log would measure about one foot in length and has a diameter of about one inch, and is secured to one end of a long light steel wire—such as piano wire. Before going further it is well to point out at this juncture, that it is perfectly feasible to utilize an "electric log" for this purpose, and not necessarily a purely mechanical log, as seems to be the idea held by most of the aeronautical engineers who have discust this idea in the technical press. As has been pointed out in several of the discussions concerning this method of indicating the direction of flight of an aeroplane and the mileage covered, there is the objection, altho slight,

(Continued on page 413)



The Crossing of the Atlantic Ocean by Aeroplane Is Not Such a Simple Task as it May Seem, Even for an Experienced Pilot. This Is so Because, Until the Invention of the "Aeroplane Log" by Admiral Fiske, There Was No Way of Establishing the "Direction of Flight." This Device Here Illustrated in Actual Use and in Detail, Not Only Shows the Direction of Flight but Integrates the Mileage Flown by the 'Plane.

bottles, covering each with a glass plate. Test the action of the gas towards combustion, by thrusting a lighted splint into the flask.

EXPERIMENT NO. 146.

Prepare a hydrogen generator and cause the hydrogen to be liberated by permitting hydrochloric acid to act upon zinc. Use only a small quantity of zinc and have some water in the flask, then introduce the acid in small quantity thru the thistle tube.

Instead of collecting it under water as we did in our experiments with hydrogen (December, 1916, Lesson) bend a delivery tube as shown in Fig. 135, with a small opening at the end and reaching nearly to the bottom of a large bottle. When hydrogen is escaping quite freely, test it for air by applying a lighted splint, and when all the air is expelled, ignite the hydrogen at the capillary.

(To be continued)

WHY NOT ELECTRICITY FROM THE OCEAN?

(Continued from page 377)

To those who have not experimented with a float mounted on such a body of water as to give it appreciable power whenever waves were produced, such as on rivers, lakes, or perhaps on the ocean shore, it is probably a little difficult to perceive that such a power plant as this will develop any really appreciable amount of energy. The reader may form a good idea as to just how much power even a small wave will give by an instance which the author noted not long ago. In this case, the float (on the shore) measured about ten by twenty feet and was used as a launch landing on a river a mile wide. Whenever one of the steamboats plying this river past at a distance of half a mile, i.e., in midstream, the waves created from the side-wheels of the boat were sufficient, when they reached the shore, to oscillate the float (on which rested one end of a fairly long and heavy gang plank) with surprising power, and to give an idea of just how powerful this action was, it can be stated that with four people, weighing about six hundred pounds in the aggregate, the float was thrown rapidly up and down on its guide poles a distance of about four feet, much as if it had been merely an egg shell resting on the water. By comparison it is easy to see that the ocean waves, which are much more powerful on the average, would exert an infinitely greater power. In the case of the float just cited, the work expended by the waves amounted to 2,400 foot-pounds or considerable over one foot-ton. The float was capable of lifting a much greater weight than that mentioned, but this will serve as a practical example to show the great power possest by a moving body of water.

For further details see Transactions of the American Society Mechanical Engineers, XIII, 438 and Kent's Mechanical Engineer's Hand-book. 1916 Edition. Also see article entitled "Electric Power from Ocean Waves" in the February, 1917, issue of this journal.

AN ELECTRIC SPEED AND DIRECTION INDICATOR FOR TRANSATLANTIC 'PLANES.

(Continued from page 375)

that the floating log being pulled thru the water would have to be periodically hauled aboard the aeroplane so as to read its dials. Several minutes would be consumed undoubtedly in hauling up the log and taking its reading, and some authorities have mentioned that this might cause an error as great as two per cent, owing to the time during which the log was out of the water, and the exact distance flown over would not then be recorded by the mechanism.

The drawing herewith shows the simple arrangement of electrical apparatus in-