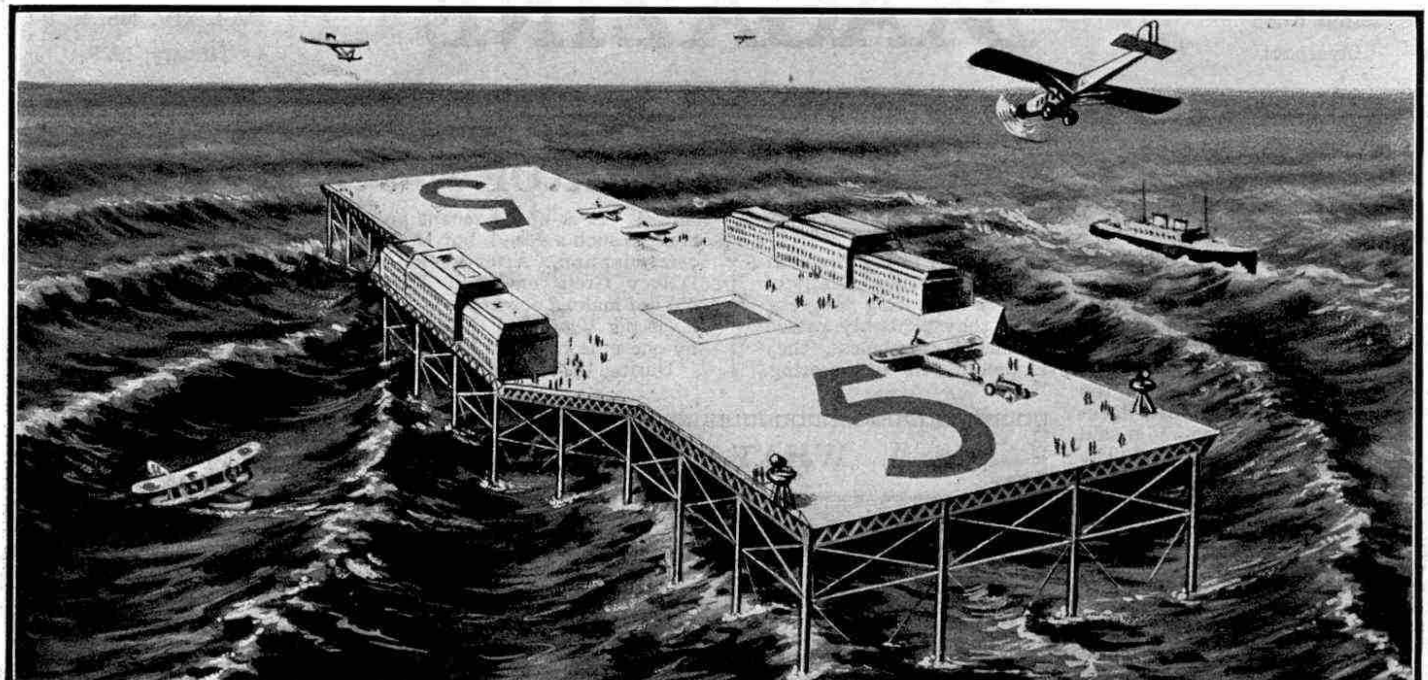
Wonderful Seadrome Scheme

Aeroplane Landing Grounds in the Atlantic



THE few successful aeroplane flights that have been made across the Atlantic have shown that the crossing is feasible under ideal weather conditions but extremely hazardous in bad weather. Even in the most favourable circumstances, however, the crossing is not an economic proposition on account of the relatively enormous weight of petrol that must be carried to accomplish the distance. There is no doubt that the range of aeroplanes will increase considerably during the next few years but nevertheless it appears probable that the solution of the Atlantic crossing problem will be found only in the provision of intermediate landing grounds.

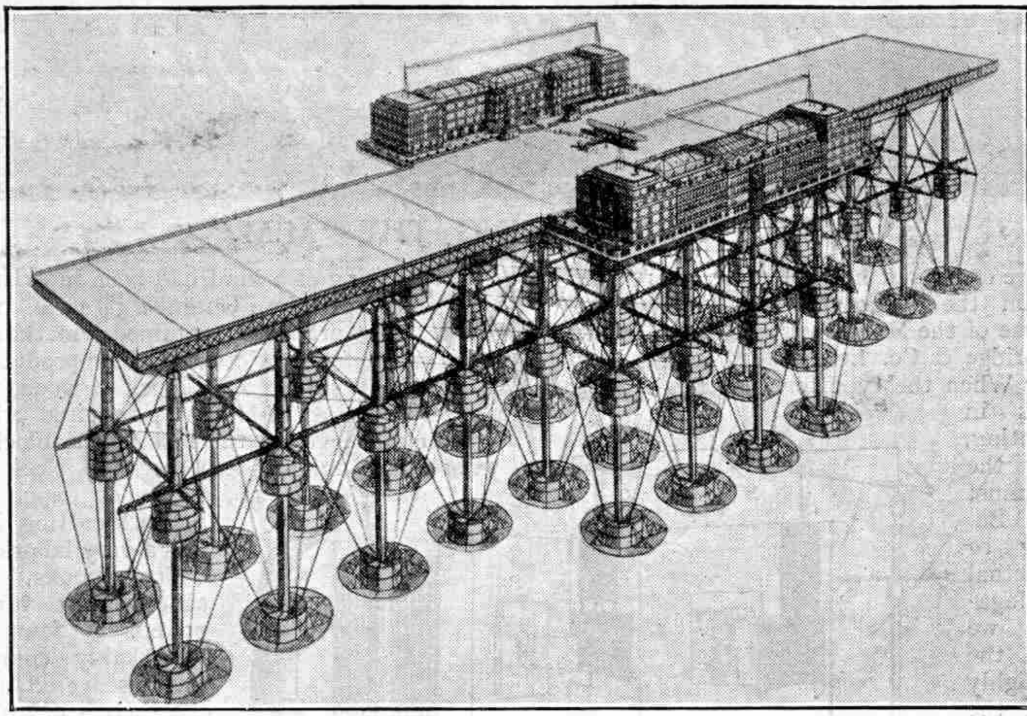
Until recently the idea of establishing a chain of floating aerodromes across the Atlantic appeared wildly fantastic, but a promising scheme has now been evolved by an American engineer, Mr. Edward R. Armstrong. This inventor has progressed so far as to have formed a company that intends to place a line of floating aerodromes across the Atlantic at intervals of 400 miles with smaller stations half way between them. If the scheme can be carried out successfully the year 1930 may see the establishment of a regular daily trans-Atlantic air service, maintained by amphibian aeroplanes of the Sikorski type. The operating range of these machines will be very greatly in excess of the distance between the seadromes, as the new structures may be called, and as a very detailed check upon weather conditions all along the route will then be possible, the Atlantic flight promises to become as safe as the journey by air from London to Paris.

For some years Mr. Armstrong was chief engineer of an American company and during this period he was called upon to design a floating factory to extract bromine from sea water for the purpose of manufacturing one of the constituents of ethyl petrol. One result of this work was to revive in his mind an idea that had occurred to him at least 20 years before—the possibility of placing a string of landing stages across the Atlantic to facilitate developments in aviation. Although he continued to turn over the idea in his mind he was too fully occupied with other work to make practical progress until 1926, when he reached the stage of constructing a model.

Subsequently the idea hung fire until the successful trans-Atlantic flights made by American pilots in 1927. A new model was then made and it was decided to proceed with the construction of a seadrome large enough to be placed at a point about 400 miles south-east of New York, in order to give the scheme a thorough test under service conditions. This particular position was chosen as the first stage of a route across the Atlantic that would be below the limit of drifting icebergs.

In planning his sea-raft Mr. Armstrong's chief aim has been to eliminate the effect of wave motion, and he claims to have accomplished this by taking advantage of the fact that oceanic disturbances are more limited in range than is generally supposed. The greatest waves seldom exceed 42 ft. in height, while the depth at which wave motion on the surface has any appreciable effect is considerably less than this. It seemed to the inventor, therefore, that a skeleton steel structure with its upper deck more than 45 ft. above water, and having its centre of gravity below the limit of under-water disturbance, would be practically free from the roll and pitch of surface vessels.

Experiments soon showed that this was the case. A structure was designed to have an upper deck 100 ft. above the water level, while its centre of equilibrium was to be lowered to the required depth by supporting the deck on telescopic steel tubes, the inner members of which could be extended to reach a depth of 185 ft. This method of construction was planned to make it possible to build the full scale seadrome in any shipyard, as it could be given a draft of less than 30 ft., which would be increased to the full amount after the giant raft had been towed to its anchorage. Discs of large area and weights were to be attached to the lower ends of the supports in order to keep the seadrome absolutely steady.



Courtesy] [Modern Transport

Sketch of one of the projected Armstrong Seadromes for trans-Atlantic air services, showing the landing deck, the hotels and the supporting "legs"

Interesting information with regard to the probable behaviour of the proposed structure was obtained by experiments with a scale model in a pond. It was found that waves corresponding to a height of 120 ft. at sea had no noticeable effect on the level of the deck of the model, while waves only half the height completely swamped a model of the "*Majestic*" on the same scale that was used for comparison purposes. The first reason for this difference in behaviour between the seadrome and the liner is that the open method of construction adopted in the case of the former presents practically no obstacle to the passing waves, while the slight force that is exerted on the supporting columns is more than counterbalanced by the effect of the damping discs. The second reason is that the centre of gravity of the seadrome model was well below the area of disturbance, whereas in the case of the model of the "*Majestic*" it was practically at the place where the disturbance was greatest.

The landing-deck of the Armstrong seadrome will be 900 ft. in length and 240 ft. in width. Towards the middle the width will be increased to 400 ft. to accommodate hotel buildings, offices and a meteorological station. It is anticipated that soon after the inauguration of the service from 2,000 to 3,000 people will pass through each seadrome daily and that many will stay for longer periods than the 15 minutes allowed for refuelling the aeroplanes. The staff required to carry out the necessary work in the hotels, offices and workshops, will be at least 150 for each seadrome.

A special deck below the landing is to be used for work on the aeroplanes and on the seadrome itself. The petrol, oil and water required for replenishing the supplies of the aeroplanes prior to despatching them to the next station will be stored in watertight compartments in the hollow portions of the supporting columns.

The area of the landing deck, exclusive of the space covered by buildings, will be about six acres, and it is possible that the main seadromes eventually will be given a deck area of not less than 12 acres. The hotels will provide accommodation for 250 people so that, with the 150 required for the various services, there will be a total population of 400. Eight main seadromes, 400 miles apart, and nine subsidiary stations are planned, so that when the scheme is completed the Atlantic will probably possess a semi-permanent population of 4,000!

Approximately 10,000 tons of steel and iron will be used in the construction of the seadromes. Heavy ballast will be necessary to keep the raft trimmed, and this probably will be in the form of iron ore stored in the lower portions of the cylindrical legs, bringing the total weight to approximately 50,000 tons. It is anticipated that the cost of each station will be somewhere about £300,000.

The greatest difficulty of the whole scheme undoubtedly lies in the securing of efficient anchorage. The bottom of the Atlantic ocean is at an average depth of some two miles. The length of an anchor cable in practice is three times the depth of the anchorage, which means that in order to anchor a seadrome a chain six miles in length will be required. The trouble lies in the fact that a heavy chain of this enormous length would have quite sufficient to do in preventing itself from snapping under its own weight, without having to undergo any additional strain.

Mr. Armstrong proposes to solve this problem by not anchoring the seadrome directly to the cable, but to a huge spar buoy about 60 ft. in length and of small diameter, to which the upper end of the anchor cable will be secured. This buoy, like the seadrome itself, will offer very little resistance to the waves. Thus the heaving stresses due to surface movement of the water will not be transmitted to the anchor cable, which will be called upon to do very little more than support its own weight.

The scheme appears feasible and details of the behaviour of the trial seadrome will be awaited with great interest.