

AVIATION

# Giant Flying Clipper Boats Can "Make Turn on a Dime"

## Engineers' Meeting Hears Advantages of Scale Model In Rushing Production; "In-Line" Engine Discussed

**A** SOBER picture of the performance characteristics of the giant trans-oceanic clipper flying boats that have excited the admiration of the entire world was presented to the national aeronautic meeting of the Society of Automotive Engineers by William K. Ebel, engineer of the Glenn L. Martin Company, builders of the Pacific and Soviet clippers.

The great metal birds can figuratively turn on a dime even when taxiing at high speed preparatory to taking off, Mr. Ebel told his audience. Should an obstruction appear on the water lane down which the boat is roaring for the take-off, the pilot can cut two motors on one side and swing his rudder at the same time, taking the boat quickly and safely out of harm's way.

"This maneuver represents an extreme condition and is recommended for emergency use only, as it is quite certain that unless passengers have their belts securely fastened they will be thrown from their seats."

So adjusted that a skilled pilot who knows his ship can maneuver it in a crowded harbor by using his engines and taking advantage of drift and wind conditions, the boat is nevertheless seaworthy in the extreme, he indicated.

Quite naturally one of these large planes, it was explained, is not quite so maneuverable as smaller flying ships, but it is nevertheless easy to control in flight.

### Test Model

Aiding the Martin Company in their development of still larger flying vessels, Mr. Ebel reported, is the development of a quarter scale model for actual flight of the plane they expect to build. This model, large enough for a pilot and observer, is an addition to the towing tests carried out on a model of the hull and to the windtunnel tests carried out on a small model.

Use of the model, on which changes indicated by test results are made prior to building of the full size plane results in great savings, he declared, not only of money but of time also.

Prior to the development of this scheme, a prototype plane had to be built before mass production of a given type was started. Development of the prototype plane and carrying out tests on it requires a year, thus slowing production and making the plane, when it is finally manufactured in quantity, that much out of date.

### Growing Interest

"In-line" engines, whose cylinders are lined up one behind the other and which have small cross-sections and therefore less wind resistance, are attracting increasing attention, R. M. Hazen and O. V. Montieth of the Allison Engineering Company, told their colleagues, "particularly in the larger powers," for the larger present-day engines present serious streamlining problems.

Such engines as Mr. Hazen and Mr. Montieth discussed are of growing importance to military aviation, particularly for use in small speedy pursuit planes. European engineers have made considerable advances during recent years while America has just lately become interested. The two engineers read a report on vibration studies made on the new engine.

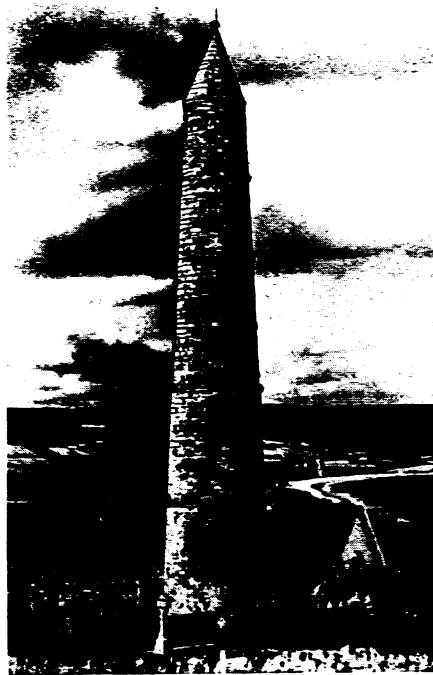
*Science News Letter, March 19, 1938*

ENGINEERING

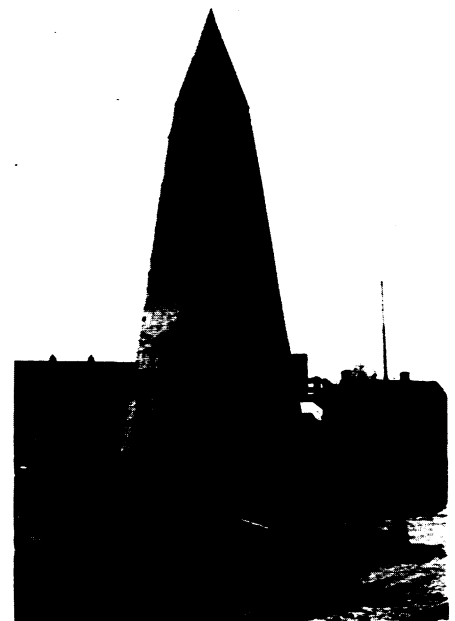
## Modern Defense Towers Like Ancient Refuges

**N**EWEST device for the protection of civilian populations against air raids is a strong, windowless tower of concrete nine stories high, in which 400 persons can find shelter for the duration of any raid. This air defense tower has been developed by the Draegerwerk, Luebeck, Germany, manufacturers of gas masks and respirators for industrial as well as military use.

The tower is bombproof as well as gasproof. Small in area as seen from the air, it presents an almost impossible target under even the most favorable bombing conditions. Moreover, its conical top is sheathed in stout steel, to deflect any



ANCIENT



MODERN

*Separated in time by nearly a thousand years from the new German air defense tower is this famous Ardmore round tower in County Waterford, Ireland (left). It also was intended for defense against military attack. The new Draegerwerk air defense tower in Luebeck, Germany, is similar in purpose as well as external appearance to ancient military towers.*