chaeologists from the United States will be distributed among the expeditions. To work with them, student and other assistants are being chosen in the Latin American countries. Latin America's archaeologists are cooperating in the work in various ways. Dr. Julio Tello, one of Peru's outstanding archaeologists, is counsellor to an expedition studying racial problems of aboriginal Peru.

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AERONAUTICS

Five American Airplanes To Use "Contra-Prop" System

Experimental Models of Military Airplanes Will Use Two Propellers on Same Shaft Turning Opposite Ways

AT LEAST five experimental models of military airplanes, all cruising at more than 400 miles an hour because of the adoption of the principle of utilizing two airplane propellers turning in opposite directions on the same shaft, will be turned out in the United States within a year.

That is the prediction of Robert J. Woods, chief design engineer of the Bell Aircraft Corporation in Buffalo and designer of the radical Bell Airacobra pursuit ship.

"The dual rotation principle, first employed on an Italian racing ship about 12 years ago, has been studied by practically every designer in the country," he declared. "Now the study is coming to fruition. And the propeller companies all are making the new type props."

It has been said that the Curtiss Airplane Division in Buffalo had experimented with the principle in the P-36 about three years ago but abandoned the idea for the time. Aviation circles said that since both Bell and Curtiss were leaders in aeronautical design, both Buffalo factories probably would turn out models using the twin prop.

Mr. Woods said the twin propeller may be used on the pusher-type plane, with the prop behind the engine.

"Twin props will be used only on ships carrying 2000 or more horsepower but they'll soon be standard on those ships. When horsepower increases, the plane requires either a longer prop or more blades. Twelve feet is pretty much the limit for prop diameter and when you get more than four blades on a propeller they begin to interfere with each other. So the next thing for the engineer to do is get two propellers.

"The second advantage of the dual rotation principle is that it eliminates torque, the tendency of the airplane to move in the direction in which the single propeller is rotating. With two propellers revolving in opposite directions, they counterbalance each other and keep the plane on more of a straight line. Since torque is proportional to the square of the revolutions per minute and not to air speed, two propellers are practically a necessity with 2000-horsepower engines."

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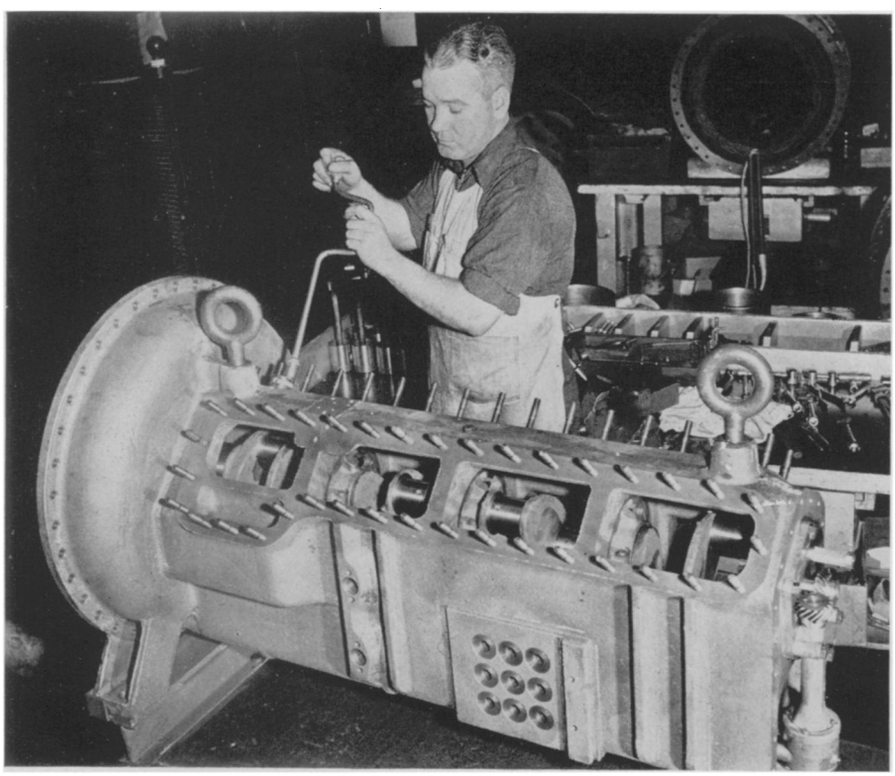

FOR FRESH AIR IN BLACKOUT

Every minute 56 tons of air will be forced through the windowless buildings of the new Douglas airplane factory. The 100 hp compressor above is part of one of the 35 complete Westinghouse air conditioning systems that will maintain comfortable conditions. The workman is setting the crankcase studs in preparation for mounting the cylinder blocks.

ENGINEERING

23,000 Lamps and 35 Air Conditioners in Factory

See Front Cover

WITH 35 complete air conditioning plants to maintain comfortable conditions and sufficient illumination to provide for a city of 83,000—the size of Lincoln, Nebraska—workers in the 11 new buildings of the "blackout" factory of the Douglas Aircraft Co. at Long Beach, Calif., will not mind the absence of windows. The plant was designed in this way to make for complete invisibility at night from any possible enemy raiders.

A few of the 8,000 mercury vapor lamps, 400 watts each, to be used in the factory areas, are shown in the cover illustration as they were undergoing tests recently at the Westinghouse Lamp Division, Bloomfield, N. J. In addition nearly 15,000 fluorescent lamps will be used in drafting rooms and offices.

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