

AERONAUTICS

ELEVENTH ANNUAL REPORT

OF THE

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

1925

INCLUDING TECHNICAL REPORTS

Nos. 210 to 232



WASHINGTON
GOVERNMENT PRINTING OFFICE

1926

wear when an abrasive is in the oil. Preliminary tests indicate that this machine will prove to be unusually valuable.

Investigation of piston friction.—This project had as its aim the finding of the relative magnitude of certain factors affecting piston friction in order that the friction of engines, particularly those of the aviation type, might be more accurately estimated. The experimental work has consisted of measurements of the friction of a four-cylinder engine equipped with several groups of pistons, each group differing from the standard pistons in but one respect. The experimental work on this investigation has been completed and a report is in preparation.

Hot wire anemometer.—A technologic paper has been prepared and published describing the hot wire anemometer which was constructed to measure the average flow of air through radiators mounted in different positions on an airplane.

NEW ENGINE TYPES

Both the Bureau of Aeronautics of the Navy Department and the engineering division of the Army Air Service have continued their efforts toward an increase in the dependability of aircraft engines and their accessories and in bringing about a greater life between overhauls. The two organizations have cooperated closely in developments. The Air Service has continued work on the cam engine and barrel type or Almen engine. The Bureau of Aeronautics has been conducting tests on its experimental heavy-oil engine purchased from the Eastern Engineering Co. (Ltd.), Montreal, Canada. This engine has not developed the power anticipated, but it has demonstrated conclusively that heavy oil can be properly burned in high-speed engines of the two-stroke autoignition, solid-injection type. Development is continuing on the project and promising results have been obtained.

A striking piece of work on the part of the Air Service is the new air-cooled Liberty. This engine has demonstrated on test that the air-cooled in-line engine will be one of the important developments of the future.

Of the service types the Wright Model "J" has advanced to the J-4-A model. The Navy has 140 of these on order, of which a large number have been delivered. Contracts will soon be let for an additional order of the model J-5 which involves an improved cylinder construction. Forty-five J-4 engines have been sold to commercial activities in the United States and to foreign countries in the Western Hemisphere. A life between overhauls of about 200 hours is being obtained and very dependable performance has resulted.

The Wright Model T-3A, a 600-horsepower water-cooled engine for the combined scouting-torpedo-bombing airplanes, is now in general service and has given excellent results. This engine has now advanced to the T-3A type, incorporating minor improvements and changes designed to bring about a life between overhauls of 300 hours.

The Wright Model P-2, the 400-horsepower static-radial, air-cooled engine, which incorporates the fan-type supercharger for rotary induction purposes, has passed its acceptance tests with very excellent performance. **Twelve of these engines have been ordered for flight testing purposes and for further development looking toward the service application of this engine at a future date.**

The Wright Aeronautical Corporation is developing a new engine of 1,200 cubic inches capacity, scaled down from the P-2 model. This will produce a line of three air-cooled engines in 800, 1,200, and 1,600 cubic inches, designed to meet the Navy's needs in all types of aircraft. The model "J" will be used as a training engine, the new R-1200 in the observation and fighter class, and the large P-2 for single and twin-engined bomber installation.

Both the Army and the Navy have continued the development of the Packard 1A-1500 and 1A-2500 engines. The inverted 1500 is being used in the Loening amphibian, the vertical 1500 in fighters, and the geared 1500 in the large patrol airplane. This latter engine was the power plant for the PN-9's used on the San Francisco to Hawaii project. The first PN-9 holds the world's endurance record for sea planes at 28 hours and 35 minutes, and the same airplane on the Honolulu flight had perfect engine performance until the gasoline was exhausted. The Packard 1A-2500, 800-horsepower water-cooled engine geared two to one, was installed