

**RECORD PLANE**

This Lockheed P-38 interceptor-pursuit plane, the first of several hundred for the Army and the British, is the one in which a record for horizontal flight was established.

AERONAUTICS

Record For Horizontal Flight Set By "Supercharged" Pilot

Tanking Up in Advance of Flight, Test Pilot Succeeds in Exceeding the 404 Miles Per Hour Already Set

See Front Cover

A NEW speed record for horizontal flight of an airplane has been set recently by a Lockheed P-38 interceptor-pursuit plane, it was announced in Burbank, Calif. The record-breaking airplane is the first to come off the production line, to fill a U. S. Army Air Corps order for several hundred, in addition to nearly a thousand being made for Great Britain.

The exact speed which established the record has not been revealed. However, a recent issue of the British weekly, *The Aeroplane*, which gives details of all the aircraft being made in the United States for Britain, says that its maximum speed at 16,000 feet, is 404 miles per hour. Apparently this was based on a preliminary model that first flew in 1939, so the new record probably exceeds this figure.

The Aeroplane also states that it is armed with four machine guns, and a cannon in the nose. It is powered with two liquid-cooled 1090 horsepower Allison engines. For the R. A. F., the magazine indicates, it is made as a two-seater,

with a turret, but the U. S. Army model is a single seater.

Milo Burcham, Lockheed test pilot who set the new record, is shown in the cover picture just after landing. He was himself "supercharged" for his ventures into the stratosphere in testing the new ship. This is done, in accordance with methods developed at the Mayo Clinic, as a safeguard against aeroembolism, a form of "bends" like that which afflicts deep sea divers when they come to the surface too quickly. In the case of fliers, it may occur when they climb above 30,000 feet too rapidly. (*See SNL, Jan. 6, 1940*)

Before he starts, the pilot dons an oxygen inhalation apparatus, with breathing mask and bag connected to the gas cylinder, and pedals a fixed bicycle for 30 minutes. This reduces by about half the nitrogen gas that is contained in the body. Thus the nitrogen bubbles that cause the bends cannot form in the blood vessels.

After taking the supercharging treatment, the pilot cannot breathe ordinary

air before his flight, or his efforts are undone. Continuing to breathe oxygen from a portable tank, he enters his plane, and connects with the regular supply.

With older planes, which climbed more slowly, the pilot had started to breathe oxygen at the start of a trip to great altitudes, and by the time he got there, his body was prepared. The P-38, however, has an initial rate of climb of 2,860 feet per minute, so it can reach a dangerous level in the time it takes an average person to walk around the block.

Science News Letter, March 1, 1941

CHEMISTRY

Production of Toluol Aided by New Formulas

TOLUOL, basis of TNT, which is trinitrotoluol, and other chemicals important in preparing for American defense, will be aided with new formulas announced at the meeting of the American Institute of Mining and Metallurgical Engineers in New York. They were developed by Dr. H. H. Lowry, director of the Coal Research Laboratory of the Carnegie Institute of Technology, aided by H. G. Landau and Leah L. Naugle.

These formulas make it possible to determine accurately in advance the properties and amounts of coke and by-products obtained from the carbonization of coal. The chief by-products are tar, gas, ammonium sulphate and light oil. The latter is the raw material from which toluol is obtained, but all the others are important also in defense industries.

In addition to giving scientific control, which assures more accurate planning in the production of the coking by-products, Dr. Lowry's work also makes possible greatly increased economy, by eliminating expensive oven tests. One steel company alone, he stated, has been able to save many thousands of dollars in the single item of eliminating the sulphur analysis of coke.

Carrying Dr. Lowry's work a step further, M. A. Mayers and H. G. Landau, also of Carnegie Tech's Coal Research Laboratory, announced before the meeting, a method for controlling the properties of pig iron and the economy of production in blast furnace operation.

This method ascertains the particular qualities in the coke necessary to produce certain qualities and quantities of pig iron under specific conditions of operation and ore analysis.

Formulas were developed in this research whereby for the first time blast