

## AERONAUTICS

# Air-Borne Engine Starter

Jet plane usability will be greatly increased with the high-speed air turbine starter which is attached to the engine. It is a push-button device.

► JET-ENGINE planes, and those equipped with turboprops as well, will have their use greatly increased with a new self-starter system revealed in Philadelphia by the U. S. Navy Bureau of Aeronautics. It is said to be the first successful air-borne self-starter developed for this purpose.

The new self-starting system, a unit installed in the plane, will allow jet and turboprop aircraft to use out-of-the-way bases which are not equipped with ground apparatus to start their engines. It eliminates the use of cumbersome storage batteries or other heavy auxiliary power units outside the plane.

The problem of starting a jet propulsion engine is one of the handicaps in the wider use of this type of propulsion in aircraft. It is radically different from the job of starting ordinary reciprocating aircraft engines in the amount of power required. Starters for reciprocating engines use from two to four horsepower. Starters for turbo-jet and turbo-propeller engines require from 10 to 250 horsepower. The new development will give the required power and still is light enough to be installed in a plane.

The new self-starter is a pneumatic starting system, perfected by AiResearch Manufacturing Company, Los Angeles, in connection with the Navy Bureau of Aeronautics. It includes a completely new light-weight auxiliary gas turbine engine and a highly efficient midget air turbine. The engine weighs only 88 pounds. The highly compressed air delivered by it operates the high-speed air turbine starter which is attached directly to the jet or turboprop engine.

The auxiliary gas turbine is started by a three-quarter horsepower electric motor which gets its power from a single storage battery. It is all a push-button device. When the pilot pushes a button, the electric motor starts. The rest is automatic.

The auxiliary engine which powers the starter is designed also for other uses after its number one job is completed. It can be used to pressurize the cabin, for air-conditioning, heating and de-icing, and to operate other power-consuming devices, such as the plane accessories.

The complete self-starting system weighs only 104 pounds. When used in planes with several engines, only one gas turbine is needed. The compressed air from it is carried by ducts to the various jet or turboprop engines.

Two versions of the diminutive multiple-use gas turbine have been developed by

AiResearch. Both represent a substantial decrease in weight and size over existing aircraft auxiliary power units. They may be adapted for ground sources of auxiliary power and industrial applications. High-precision turbine wheels spinning in excess of 40,000 revolutions per minute, together with combustion temperatures higher than 1,600 degrees Fahrenheit, make possible their exceptionally high ratio of power for weight and size.

Science News Letter, December 18, 1948

## CHEMISTRY

## Synthetic Alcohol Made From Gasoline and Gases

► THE FIRST commercial production of a synthetic alcohol has been achieved by Esso Standard Oil Co. at Baton Rouge, La., by a new process which provides a large low-cost source of raw material in plastics manufacturing.

The synthetic, iso-octyl alcohol, is used in the production of plasticizers, a basic

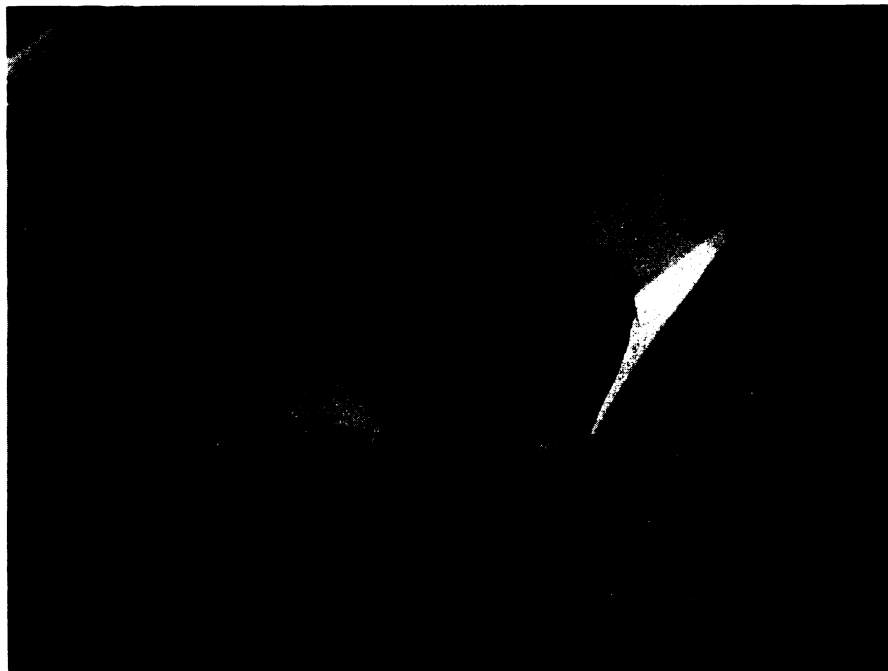
ingredient in compounding and forming plastics and in giving flexibility and suppleness to the finished products. Plasticizers are used in a wide variety of plastic products including fabrics for upholstery and curtains, phonograph records, food packaging, floor coverings, paints and varnishes, and in rubber compounding. Full-scale production by this method will help relieve current shortages in plasticizers.

The process involves the reaction of a selected gasoline fraction with hydrogen and carbon monoxide gases in the presence of a special catalyst at pressure up to 3,000 pounds per square inch. Crude alcohol is recovered from the high-pressure operation and purified to yield finished iso-octyl alcohol. The process is flexible and other alcohols and chemicals can be made from it.

This method is an adaptation of the Oxo process and culminates three years of extensive laboratory and pilot plant experimentation by Standard Oil Development Company, central research organization of Standard Oil Company (New Jersey) affiliates.

Iso-octyl is principally an "intermediate" or raw material for other chemicals. It also has possibilities as a resin solvent and anti-foaming agent. Through other processes it can be converted to wetting agents or to metallic salts that make effective paint driers.

Science News Letter, December 18, 1948



*SELF-STARTER FOR JETS—Jet and turboprop aircraft will be able to use out-of-the-way bases not equipped with ground apparatus to start their engines when this air-borne system goes into effect.*