SCIENCE NEWS

Science Service, Washington, D. C.

THE JET PROPULSION OF AIRPLANES

AIRCRAFT design is progressing at a portentious rate. Within recent years the speed, operational ceiling, rate of climb and load-carrying capacity of planes have all been improved. The demand for greater power in a single unit, with reduced dimensions and lighter weight, has brought forth the jet propulsion engine.

Opinion among airplane designers is divided on the subject of jet propulsion. On one side are those who believe that the jet engine will soon be exclusively powering high-performance, short-range airplanes, and that as the engine is further developed, jet propulsion will encroach on the longer-range aircraft. On the other side are those who agree that while the jet-propelled plane has a place in the flight spectrum it will be limited to military uses, and it will be some years before the public will be able to accept it as a practicable means of transportation.

The jet engine is simple in construction, and is made up of only a few moving parts, while the gasoline engine is made up of thousands of parts. The jet engine weighs much less than the conventional motor, thus reducing the total weight of the plane and making it more maneuverable, a vital factor in military flying.

The jet plane flies smoothly, with none of the vibration of the conventional engine and propeller so objectionable to some passengers in the present commercial airplanes. This argument is of no great concern to the proponents of gasoline engines since they point out that another power unit—the gas turbine—can be used to supply power to the propeller, with a minimum of vibration.

The serious disadvantage of the jet engine is its high fuel consumption at low speeds. Over a 400-mile flight course and flying at 100 miles an hour, the jet engine consumes 70 gallons of fuel, while the gasoline engine uses only 16 gallons. But if speeds of 500 miles an hour or more are reached, the jet becomes more economical. At 600 miles an hour, over the same course, the jet engine will use up 770 gallons of fuel, while the gasoline engine will consume 850 gallons.

However, the jet engine becomes more powerful for its weight and size at higher speeds. In a tug-of-war at 600 miles an hour, one jet engine can pull as much as five propeller-type engines of equal weight.

Those who favor the gasoline engine point out that the demand for travel at speeds above 550 miles an hour would have to be considerable to make commercial transportation in jet planes feasible.

It is entirely possible that if speeds below and just above that at which the jet engine becomes superior to the gasoline engine become desirable for commercial transportation in the postwar era, a cross between a jet plane and a propeller plane may be developed. This plane would use a gas turbine to drive the propeller, and use the exhaust gases to produce a form of jet thrust.—ROBERT N. FARR.

ITEMS

A NEW liquid foam fire extinguisher for combating fires at sea has a special nozzle attachment where the foaming charge of soy-bean meal or other protein base is mixed with a foaming agent and water by action that is basically mechanical rather than chemical, to produce a fire-smothering blanket. The new foam extinguisher, perfected by the Bureau of Ships of the Navy Department, is more fluid and therefore flows around and over objects better. It will retain its consistency for more than two hours. It eliminates danger to property and fire-fighter alike by reducing the hazard of re-ignition and flashback, which occurs when flames retrace their path.

A NEW uniform identification system for steel sheet, bar, wire and rod, that will simplify stockroom problems may be adopted to replace the color code plan now in use. The proposed system consists of a printed legend stating the Army-Navy specification number and condition, nominal thickness, manufacturer's trademark or name, and possibly commercial designation. It is based on ideas contributed jointly by the Army, Navy, aircraft and steel industries. Lack of a standardized system of source marking and the inadequacy of methods used by individual aircraft manufacturers have caused the diversion of thousands of man-hours and has made necessary extensive tests and chemical analyses to determine the true nature of steel scrap before returning it to the mill. Final approval of the newly-evolved source-marking system is expected at the special Army-Navy-Industry Conference to be held in New York City on September 19.

PASSENGER car owners may have nearly 700 gallons of gas apiece to drive after the war in Europe, if estimates made by C. L. Burrill, petroleum economist of the Standard Oil Company of New Jersey, as reported to *Petroleum Technology*, are correct. In any event, gasoline will be plentiful in the immediate postwar period as military consumption declines. Gasoline consumption will be heavy because cars will be older, and probably use more gasoline per mile of travel. Also contributing to the heavy consumption of gasoline will be the large amount of automotive travel by families returning to their homes from war production centers. In addition to the crude oil produced in the United States, the total supply of petroleum products available to meet postwar requirements includes a substantial amount of natural gasoline as well as imports of fuel oil and heavy crude oil. It is generally believed, Mr. Burrill states, that one important effect of the substantial construction of catalytic cracking plants during the war will be to increase the yields of light products at the expense of the yield of residual fuel oil, thereby making it possible to produce the light product requirements with less crude oil than would be necessary with the older thermal cracking process.