

ENGINEERING

New Type Locomotive

First gas-turbine locomotive, made for Swiss Federal Railways, surpasses expectations in early road tests. It is suitable in areas where water is scarce.

► A SHOOTING stream of gas is used to drive the first gas-turbine locomotive which was described at the meeting of the American Society of Mechanical Engineers in New York by Paul R. Sidler of New York, resident engineer of Brown, Boveri & Company, Ltd.

Built for the Swiss Federal Railways, the new-type locomotive has not been tested as thoroughly as desired because of fuel shortage and war conditions. But enough road tests over various tracks have been made, Mr. Sidler pointed out, to demonstrate that the gas-turbine locomotive not only came up to expectations but surpassed them in some respects.

For certain uses it shows marked advantages over the Diesel locomotive, but in general it is not yet a competitor.

"It should be particularly suitable for express service over long distances," Mr. Sidler maintained, "in areas where water is scarce and where there is a considerable difference in the costs of Diesel oil as against ordinary fuel oil."

Science News Letter, December 12, 1942

Plywood More Important

► PLYWOOD planes are assuming increasingly great importance in the development of wartime aviation, and a special committee comprising leaders in the fields of aviation, wood technology and other sciences involved in building wings out of wood has been organized to cope with problems arising in the industry, as well as to find new ways of making better aircraft out of this long-neglected but now highly promising material.

Prof. Alexander Klemin of New York University, chairman of the new committee, announced its formation before a meeting of the American Society of Mechanical Engineers in New York. In the same address he pointed out some of the advantages of plywood construction which have led to the recent revival of this type of plane.

Plywood planes, Prof. Klemin stated, are really not new. On the contrary, plywood was one of the earliest mater-

ials used in airplane building. During the first World War fuselages and wings with plywood skins were successfully built both in the United States and France. Subsequently Anthony Fokker, famous Dutch designer, built many plywood planes here for mail and air transport uses. The glue was not decay-proof, however, and when a disastrous accident overtook one of Fokker's planes, plywood construction fell into disfavor and aluminum alloys took the lead away.

The present revival of the plywood plane was traced by the speaker to four principal factors: "First, synthetic resin glues have taken the place of casein and other glues of animal origin, and the new synthetic adhesives are proof against bacteria and moisture, so that decay need no longer be feared.

"Second, the plywood is a substitute for aluminum which has become a scarce

metal under the tremendous impact of war needs.

"Third, the plywood suitably finished is smoother than aluminum skin, even when countersunk rivets are used with the metal.

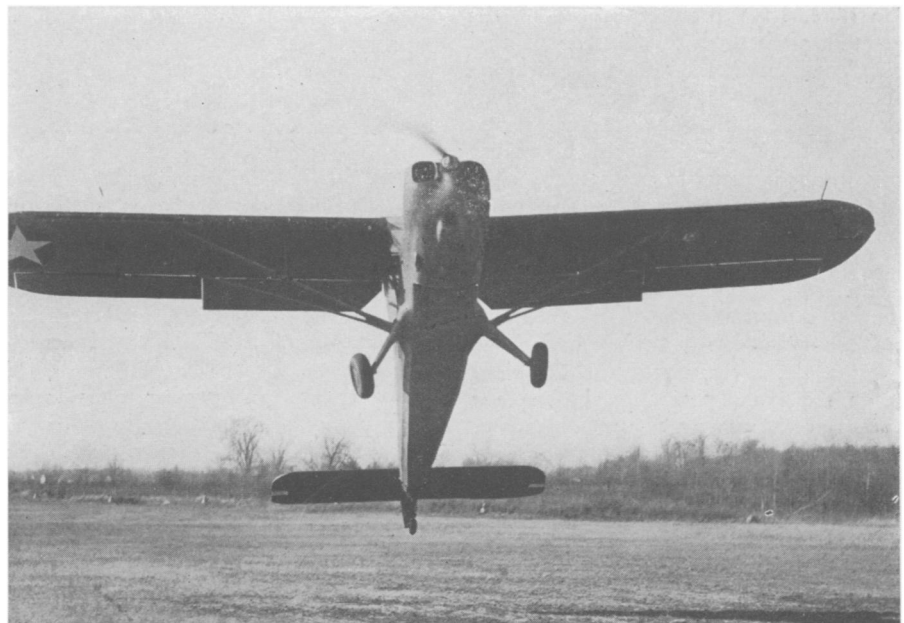
"Fourth, because the plywood is so much lighter than metal, the skin or cover of the wing can be made much thicker for a given weight. Hence the skin can be much more rigid and resistant to bending, and the wing can be built as a pure shell, with many internal parts omitted."

Another reason for the adoption of plywood, Prof. Klemin pointed out, is that the bag molding process, in which thin strips of veneer are laid over a mold and then set under heat and pressure applied through a rubber bag, is so rapid and simple that a whole fuselage, composed of only two parts, can be built in 24 hours. Thus plywood has advantages or possibilities in weight saving, greater aerodynamic efficiency and cheapness.

Science News Letter, December 12, 1942

Wood in Aircraft

► USE OF wood in America's planes is steadily advancing in both quantity and quality, Dr. Robert J. Nebesar, chief



GRASSHOPPER—This new model built by the Stinson Division of Vultee Aircraft really does look like a man-made insect although it is nicknamed by the manufacturer a "flying jeep" because it can land and take off on a highway or cow pasture and can fly at less than 45 miles an hour. It is the "Sentinel" or L-5, designed for observation for the artillery, tank corps, cavalry and infantry.

engineer of the Universal Moulded Products Corporation, reported at the meeting of the American Society of Mechanical Engineers in New York.

Aircraft with wooden fuselages and other parts have been shown to withstand shock and vibration very satisfactorily.

"Both servicing and repairs are inexpensive and comparatively easy to take care of," Dr. Nebesar declared, "these presenting no engineering problems."

New durable synthetic glues and ensuing improvements in wood processing, such as molding, pressing, and other techniques, has resulted in an ever-increasing replacement of war-scarce metals by wood in some types of planes.

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American Inventions Lead

➤ INDUSTRIAL progress in America is usually attributed to our natural resources but few people realize that Americans, more than any other people of the world, have been responsible for the epoch-making inventions of the century, A. A. Potter, dean of engineering at Purdue University, declared at the meeting of the American Society of Mechanical Engineers in New York.

Vital, young Americans, initiative spurred by their individual democratic rights being placed above those of the state, have produced some of the greatest of these discoveries, he pointed out. Westinghouse invented the airbrake at 21, for example, McCormick the harvester at 22, and Howe the sewing machine at 27. McCormick with his reaper gave more impetus to mechanized agriculture than any person in any other country, Dean Potter declared.

Among pioneer American inventions in the field of communication have been telegraph, transatlantic cable, telephone and many features of the radio.

From the invention of the *Clermont* by Fulton to the patent for the airplane by Wright, Americans have been major contributors to the field of transportation.

Many manufacturing processes are also included among American achievements, Dean Potter pointed out, such as welding, cracking gasoline, vulcanizing rubber and the manufacture of aluminum and plastics.

Our patent system, which encourages and rewards creative talent, has been a major factor in the industrial progress of this country, Dean Potter declared.

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PUBLIC HEALTH

Child Has Plague

Two-and-one-half year old baby girl in Siskiyou County, California, is expected to recover after prompt treatment with sulfa drug.

➤ A CASE of bubonic plague in a two-and-one-half year old baby girl in Siskiyou County, Calif., has been reported to the U. S. Public Health Service. This is the first case of plague in humans in the United States since the summer of 1941, when two fatal cases occurred in the same county.

The child is expected to recover, thanks apparently to treatment with sulfadiazine. The report received in Washington states that this sulfa drug was given and does not mention any use of anti-plague serum, although it gives other details of treatment such as the use of codeine to relieve pain and restlessness and injections of fluids to restore those lost because of the sickness.

The report states that the sulfa drug treatment was started following a telephone call to Dr. Karl Meyer, Hooper Foundation, University of California. Presumably it was advised by Dr. Meyer, since he has reported successful sulfa

drug treatment of plague in laboratory animals.

Where the little girl picked up the plague germs is not definitely known. Her father had hauled hay from a region where plague-infected ground squirrels were known to exist, and the child was playing in the hay the day before she got sick. Cats, dogs, mice and wood rats in the barn of the child's home are considered other possible sources of infection, since these might have harbored plague-infected fleas.

Plague-infected fleas and lice were found on Nov. 14 in 12 separate pools of rats and field mice caught in Marin County, Calif., about two miles from the San Francisco Bay area and the Sausalito shipyards. These had no connection with the plague infection in the little girl in Siskiyou County to the north, but indicate to public health officials a potential plague danger to humans elsewhere.

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ENGINEERING

Road Traffic Declines

➤ GASOLINE rationing, tire shortage and wartime restrictions on travel in general have contributed to a very decided decline in road-borne traffic, John T. Lynch, highway engineer-economist of the Public Roads Administration, told the meeting of the Highway Research Board in St. Louis. There has been a steady decline in number of vehicles of all classes, though the ratio of trucks to cars has risen. A higher percentage of trucks are running without loads, but trucks that do have loads are carrying bigger ones.

Mr. Lynch reported results of a country-wide survey of country highway travel, in which more than 500,000 vehicles were counted and classified and more than 50,000 trucks were weighed at 486 stations.

Traffic declined steadily from February to August of this year, as compared with figures for the same months in 1941. The decline was checked in Sep-

tember. This was due in part, Mr. Lynch thinks, to the passing of the normal vacation season, which this year was a period of very light traffic because of the large number of persons who did not take their vacations a-wheel.

The increased proportion of trucks running light may be traced partly to the use of light trucks as substitutes for buses and personal cars in getting workmen to their jobs, partly to the fact that many of the trucks were engaged in carrying materials to cantonments, airfields and other places where they had no chance to pick up return loads. The cargoes of trucks that did have loads were so much greater than they had been in pre-war times that despite the decreased number of loads the number of ton-miles of load carried by truck, for the country as a whole, is almost as great as in 1940. In the Pacific Coast region, indeed, it is 22% greater.

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