

AERONAUTICS

New Device Synchronizes Multi-Engine Plane Motors

Small Electric Motor of Differential Type Alters Settings of Propeller Blades Whenever Speeds Vary

AN AUTOMATIC device to drive the motors of a multi-engine airplane at exactly the same speed and thereby eliminate bumpy "beats" from flying was announced by the Hamilton Standard Propeller Division of the United Aircraft Corporation in East Hartford, Conn.

It is known as the automatic propeller synchronizer and continuously keeps engines even more finely adjusted than the most skillful human pilot. Slight differences in engine speed—on the order of 20 revolutions a minute or so—produce "beats" every few seconds which can be and often are annoying to passengers. At the same time the synchronizer relieves the already too busy crew of another job, manual adjustment of engine speed for this same purpose.

Heart of the engine synchronizer is a small electric motor of the differential type. The motor has two electrical wire windings, one fed with current from a small alternating current generator driven by one engine and the other with current from a generator powered by another engine. The frequency of the alternating current in each case depends on the speed of the motor driving the generator.

Balance Each Other

If the two engines are operating at the same speed, the current fed into each winding will be of the same frequency and the differential motor will not operate. On the other hand, if the two engines are operating at unequal speeds, the current derived from the faster engine will be of greater frequency and will turn the differential motor over. The differential motor in turn will alter the setting of the propeller blades to bring the speeds of the two motors into line.

The synchronizer may be turned off so that the pilots can have manual control of the speed if they want it, the United Aircraft Corporation explained. As the device synchronizes the motors, the speed of the differential motor is reduced, for its speed depends on how

far apart the two engines are. This enables the synchronizer to operate more surely; it doesn't have to "hunt" for the exact synchronization point.

Propellers in use in the United States on high performance airplanes such as transport ships are already of the constant speed type, but even they do not have exact enough control to eliminate the need for a synchronizer. The device was flight-tested on a twin-engined 10-passenger commercial liner converted into a flying laboratory.

Science News Letter, February 25, 1939

MEDICINE

Helium, Sun-Gas, Rescues Sandhogs Ill With "Bends"

HELIUM, the next to the lightest element in the universe, although deprived of the job of holding giant airships aloft (because the U. S. A. has none), is about to find a new job underground.

This sun-element is ready to help rescue men made ill by the high air pressures necessary when working in caissons and in subaqueous tunnels.

The Navy has shown through ten years of research that use of an atmosphere of helium and oxygen instead of the natural one of nitrogen and oxygen allows divers to work at pressures equivalent to 500 feet. Previously with ordinary compressed air the diving record was 306 feet made during salvage operations of a sunken submarine.

The advantage of helium over nitrogen is that less of it is dissolved in the diver's blood and tissues. He is less likely to get the "bends," as compressed air illness is called.

This same technique could be used on under-pressure construction by filling caisson or tunnel with helium. But this would cost prohibitively.

What Dr. Yandell Henderson, Yale physiologist and authority on such helium utilization, recommends to the American Society of Mechanical Engineers is that a helium-oxygen mixture be

used in the so-called "medical lock," a chamber used for putting the worker under pressure again if he becomes ill while being decompressed, that is, while slowly coming out of the high pressure.

If the "sandhogs" after gruelling toil to make a new traffic tunnel or sink a new bridge pier can be protected in this way by helium, this element with its romantic history will have another interesting practical use.

Science News Letter, February 25, 1939

POPULATION

New England Faces Problem Of a Declining Population

A SOLEMN warning has been issued to New England by Conrad Taeuber, population expert of the Federal Bureau of Agricultural Economics.

The Land of the Pilgrim Fathers faces new and very serious problems because the rate of her population growth is declining.

Business in New England as in all the United States has always been organized to meet the demands of a rapidly growing population. Expansion has been the rule. Booms have been taken for granted.

How will business adjust itself to the fact that the future will bring declining numbers of buyers? Fewer marriages will mean fewer homes to build and outfit. Baby foods, play suits, and school books will meet a slow market.

Along with the slowing down of population growth, New England is going to be bothered by the fact that migration to the city has slowed down tremendously. The city does not attract the farm boy, because industry has moved away. Mr. Taeuber has found that the number of active spindles in Rhode Island and Massachusetts dwindled about 60 per cent. in the 10 years from 1925 to 1935.

Here are problems never faced in America before. Yet New England may well be a proving ground for the rest of the nation, for the difficulties being threshed out there today are likely to face the entire country not so many years hence.

Here is a challenge to science, particularly the sciences of man. Here is an excellent opportunity for psychologists, anthropologists, sociologists, psychiatrists, public health officials, economists, political scientists, employment experts, agriculturists, and even chemists and physicists to mobilize for a united battle on what is likely to be America's greatest internal enemy.

Science News Letter, February 25, 1939