

Regardless of the arc which the swing describes, the time interval required for it to pass through its starting point is the same. So it is with the semi-circles described by the atomic "bullet." In each excursion, regardless of an ever-

increasing radius, the oscillating "bullet" reaches the gap separating the two disks in a period of time which is constant. It is this physical principle which gives to the apparatus its resonance feature."

Science News Letter, January 25, 1936

RADIO-AVIATION

New Aviation Radio Receives 2 Signals on Same Frequency

NEW radio aid for commercial aviation is under test in Pittsburgh, Pa., which consists of the transmission of both voice and radio range signals on the same frequency. The two sets of signals are received simultaneously in an airplane—directional signals operating a needle pointer on the instrument panel and the voice signals being received in headphones.

The new development solves the problem, existing for some time, that directional beacon signals and the weather reports went out on the same radio frequency, and thus one had to be interrupted for the other.

The limited number of frequency channels available and the need for the simplest possible receiving equipment required such interrupted service in the past. With both weather and range directions on the same frequency, the pilot did not need to change dial settings on his receiver.

The old system, while simple, had its handicaps. If a pilot was flying blind and attempting to locate an airport, it

was disconcerting to have the directional signals interrupted by a weather broadcast which told him it was raining or foggy in his vicinity. He knew that anyway, otherwise he would not be flying blind.

In a minor aspect the weather signals delayed his landing and in a major case might delay him at a time when the ceiling at the airport was lowering to zero-zero conditions.

Before the new development the Bureau of Air Commerce sometimes postponed weather information for a short while and kept the directional signals on the air continuously when requested by pilots.

This system also had its handicaps, for weather reports might be needed by other pilots, and planes with receivers but not transmitting equipment might need continuous directional signals and not to be able to request them.

The new development of receiving two signals on the same frequency solves all these problems.

Science News Letter, January 25, 1936

sign and possibly the use of new metals. This in turn may lead, in the opinion of auto engineers, to a reduction of production costs during the next decade. The wear reduction effected by the high film strength oil is alone estimated to permit a cut in national motor upkeep costs of at least \$50,000,000.

"It is proper to ask," Dr. Delbridge remarks, "whether the decrease in wear made possible by this high film strength motor oil may not have effects equal to those in the building and manufacturing industries when steel was created. Any substantial reduction in the costs of operating automobiles increases the number of people who can afford to own and operate cars."

In engineering circles the development of an effective "alloy" oil is considered significant for the reason that a crisis has long been foreseen when the strength of natural petroleum, no matter how well refined, would be inadequate to meet the increasing heat, pressure and speed of moving parts developed by the high compression automobile motor. Search for an effective "alloy" oil has been carried on for some years. The problem has been to find a substance which would increase the film strength of petroleum without reducing its effectiveness in other respects.

The strengthening chemical added to natural petroleum is known technically as the non-chlorinated ester of phosphoric acid.

Science News Letter, January 25, 1936

DENTISTRY

Chemical Test May Lead to Preventing Tooth Decay

DECAY of the teeth with attendant toothaches may be prevented in the future, if a method developed by Dr. E. P. Brady of the Washington University Dental School, St. Louis, is put into successful practice.

A dental examination can determine by a chemical test which of the teeth in one's mouth are liable to decay, says Dr. Brady. Silver nitrate, a common chemical used generally for germ killing purposes, betrays the presence on the tooth enamel of certain faults of formation. It is in these faulty areas that decay is likely to start, because there the acids in the mouth and acid-producing bacteria can penetrate through the enamel to the sensitive dentine beneath.

The decay can be prevented by the use of silver nitrate, Dr. Brady said.

After it has started, its progress can be stopped by use of another chemical

CHEMISTRY

"Alloy" Oil Promises Changes In Motoring Upkeep Costs

"ALLOY" oil, three times stronger than ordinary petroleum used in motor cars, is the latest answer of oil engineers in Philadelphia to the demands of increased lubrication pressures inside modern automobiles.

Alloy oil consists of 99 per cent. petroleum and one per cent. of a chemical relative of phosphoric acid.

In tests with stock cars driven the equivalent of ten years of average motoring, the new alloy oil markedly pre-

vented wear. Measurement showed less wear than is usual for one-tenth the 100,000 miles traveled, according to Dr. T. G. Delbridge, research director of the Atlantic Refining Co.

Significance is attached to the successful development of an "alloy" oil which obtains strength without sacrifice of any other essential lubricating qualities, for the reason that the sharp reduction in engine wear effected by the new oil may permit important changes in motor de-