

AERONAUTICS

Airplane Wiggle Traced

► A PECULIAR wiggly motion of airplanes has been traced to fuel sloshing in the fuel tank, the National Advisory Committee for Aeronautics has found.

Wiggly airplanes have bothered pilots for years. Although their noses may be pointed straight ahead, planes often weave sidewise and occasionally up and down, even in calm air.

With the cruising and fighting speeds of jet planes being pushed ever higher, this wiggly motion has become more dangerous. A jiggle at the wrong time might be disastrous.

Planes have a tendency to wiggle from side to side anyway, reports Albert A. Schy of NACA's Langley Field Aeronautical Laboratories. This tendency is called the natural airplane frequency. It compares to the back-and-forth motion of the balance wheel in your wrist watch.

If something "kicks" the airplane just at the right instant and in the right direction—the way your watch spring "kicks" the balance wheel through a complex train of gears—the jiggly motion of the airplane becomes even more pronounced. Gas slopping from side to side in the fuel tank can provide the "kicks."

When the gas sloshes from side to side with the same regularity of the airplane wiggles, the airplane oscillations are built up and conceivably could reach deadly proportions, according to an NACA expert.

Jet planes, which generally carry more fuel than piston-engined craft, thus are more affected by sloshing fuel because of the greater weight being thrown about in the fuel tanks. In aerial combat where maneuverability is at a premium, this "snaking" motion is a handicap.

But Mr. Schy reports that sloshing fuel can be controlled by baffles installed in the fuel tanks. The baffles disrupt the normal sloshing movements of the fuel so the fuel "kicks" are much weaker and come at the wrong time. This sets up turbulence in the fuel that helps to dampen the normal weaving of the plane.

Mr. Schy speculates that fuel turbulence might be responsible for greater airplane stability reported in "rough" air than when the plane is flying in calm air. With the whole airplane being tossed about by hefty up-drafts of air, the fuel is kept from sloshing in its tank at the frequency that gives trouble.

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DENTISTRY

Dentists Now Using 3-D

► A 3-D test, that is, three-dimensional analysis in color, for determining stresses and strains in jacket crowns for teeth was reported by Dr. Charles B. Walton, University of Pittsburgh School of Dentistry, at the meeting of the American Dental Association in Cleveland.

Jacket crowns are the white caps designed by dentists for front teeth. They sometimes break in normal use. The new tests locate the areas of strain, so dentists can learn the best suitable shape for a crown that will be stable enough not to rotate and strong enough not to crack.

In the tests, a crown is placed over a core, just as it would be placed over a tooth, and then it is subjected to a load, or strain, at high temperature. Dr. Walton explained:

"It was decided (in research) that if a large plastic prototype of a jacket were loaded on an appropriate core and then sectioned, we could, by viewing the sections in polarized light, find the precise areas of detrimental strain.

"Certain changes of core shape might then be made to reduce these strains and thus reduce the incidence of fracture of jacket crowns."

By the combination of heat and load, the strains developed within the plastic are "frozen" within the specimen. The speci-

men may then be sectioned for three-dimensional analysis. These sections are viewed by transmitted polarized light in a polariscope and the points of strain may be photographed and analyzed to determine their magnitude. The areas of strain show up as bands of yellow, red and green in white light.

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SURGERY

New Operation, Pills For Ulcer Patients

► A NEW operation and potassium pills are making life easier for ulcer patients. Both were reported at the meeting of the American College of Surgeons in Chicago.

The new operation converts the stomach into a long tube instead of a lima bean. The major part of the acid-secreting area is removed but vagus nerves are left intact. Among the advantages are less distress after meals, less weight loss, less diarrhea, no iron deficiency anemia and fewer symptoms of "dumping syndrome." Good results in 82 patients were reported by Drs. Lloyd D. MacLean and Richard Lillehei of the University of Minnesota.

The potassium pills, taken before meals, prevent the "dumping syndrome" symp-

toms of weakness, sudden perspiration, dizziness, nausea, crampy pain and desire to lie down which afflict many patients who have had most or all of their stomachs removed. The good results with them were reported by Drs. Allen Kleiman and Austin R. Grant of the Veterans Administration Hospital, Phoenix, Ariz.

They believe the syndrome results from a temporary deficit of potassium. All 11 patients treated to date are symptom-free on a normal diet.

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