

## AERONAUTICS

# Anti-Icer Perfected

Consolidated Catalina is first airplane equipped with device which shoots hot air through ducts on wing and tail surfaces to prevent ice formation.

➤ ANTI-ICERS for warplanes, which shoot hot air through ducts under wing and tail surfaces to prevent dangerous ice formations, have been perfected and are now being installed to make combat flying safer. In post-war flying the equipment promises to banish at last the air disasters due to icing which have occurred since the beginning of aviation.

Announcing that the Consolidated Catalina, a long range patrol bomber, is the first airplane off the production line equipped with the new device, Consolidated Vultee Aircraft Corporation revealed that plans are under way for installation of the thermo anti-icing systems in the Liberator and Coronado bombers and the new Navy flying patrol boat, P4Y-1.

Other sources indicate that several additional aircraft manufacturers are discussing adoption of this equipment and are working on the necessary design changes.

Ice elimination by means of heated air was conceived and developed over a period of years by the National Advisory Committee for Aeronautics, government research agency. Consolidated Vultee engineers have been active in perfecting the equipment, cooperating with the NACA technical staff.

In this anti-icing method, hot exhaust gases are used to heat air which is then circulated beneath wing and tail surfaces. Controlled initial temperatures range as high as 350 degrees Fahrenheit. This heated air keeps the aluminum alloy leading edges at a temperature of about 60 degrees Fahrenheit and warms the entire wing surface to a lesser degree.

Early research encountered problems of overheating and thermal expansion of the metal surfaces, which have now been overcome. Test flights in the far North have shown that the device functions perfectly.

Air ducts can be installed to supply heated air to the leading edges of the wing panels, from which the air sweeps back through the interior of the wing and over the aileron, preventing the icing of aileron controls. Tail surfaces are likewise kept free of ice. In an in-

stallation, such as has been made on the Liberator, hot air is also conducted forward to the cabin and flight deck, where it defrosts pilots' windshields, bombardier's window and heats the cabin.

Several advantages are claimed for thermo anti-icing systems:

1. There is no danger of ice caking on the wing surfaces to destroy lifting power. The pneumatically operated rubber de-icers now commonly used are intermittently inflated with air to crack the ice off leading edges, but rough ice formations are often left on top of the wing which make the plane hard to control. The new thermo anti-icing system prevents ice from forming anywhere on the surface.

2. The device can be operated during combat, at slow flying speeds and during take-offs and landings, as there is no loss of aerodynamic efficiency in either wing or tail surfaces. As better planes required smoother wing surfaces, the lowered efficiency produced by rubber pneumatic de-icers became increasingly objectionable.

3. Destruction of accumulated ice and frost by the anti-icer begins as soon as the engines of the aircraft are started during sub-freezing weather and continues as long as the motors run.

*Science News Letter, August 14, 1943*

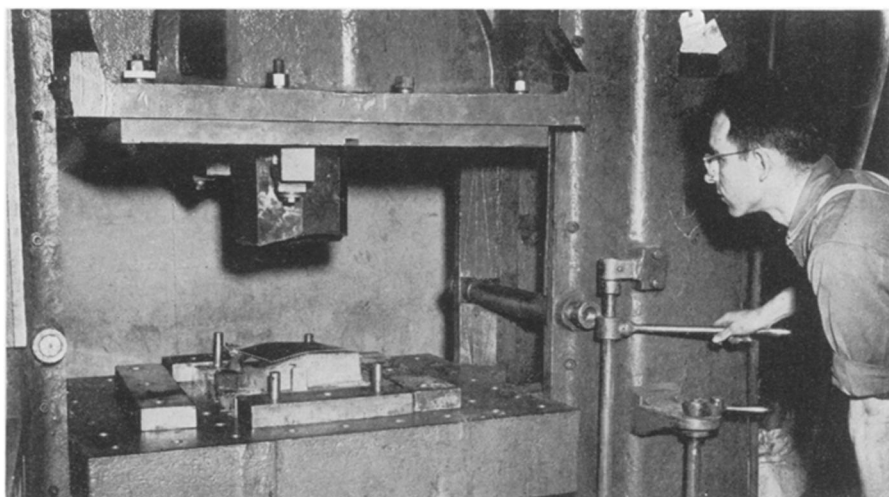
## ANATOMY

## Two Brains Discovered In Head of One Dog

➤ DISCOVERY, apparently for the first time on record, of a dog with two brains jolted scientists in the laboratories of the District of Columbia Health Department. Dr. John E. Noble, director, thought someone was playing a joke on him when first told of the discovery.

The two brains in one head were discovered in a collie of mixed type but no unusual appearance, by J. B. Holland. Mr. Holland was examining the dog's brain for rabies when he found the second, smaller brain behind the first but also attached to the dog's spinal cord. Evidence of rabies was found in both brains.

Authorities at the Bureau of Animal Industry, U. S. Department of Agriculture, declared they had never heard of such an anomaly before. Two-headed calves, five-legged animals and humans with an extra thumb or finger, yes; but a two-brained dog is apparently something new in the records. (*Turn page*)



**PLASTIC PUNCH**—To conserve critical metal in the manufacture of warplanes, the Curtiss-Wright Corporation at Buffalo has developed this plastic punch and die made of non-critical metal. Intended to save materials, the punch also saves valuable time for it can be shaped into a perfect fit with the die in a single operation; the die is heated and then the roughly shaped punch pressed to it. Pressure forces the plastic to flow and produces an exact match.