The Wright Wind Tunnel

Winds, dwarfing the destructive rampaging typhoons of China seas by their velocities, will soon be blowing in Boston—but they will be safely confined within the steel plates of the new wind tunnel at Massachusetts Institute of Technology. In this 75-foot oval-shaped chamber, scientists have combined, for the first time, means for stimulating stratospheric flying conditions at high speeds and studying skin friction, turbulence and flow separation which are important in designing any kind of machinery that handles fluids or gases. Thus man-made storms and gales will enable science to study on the ground man's newest domain of the air. Thirty-five years ago at Kitty Hawk, N. C., the Wright brothers achieved their first actual flight. Orville Wright dedicated this newest research arm of the air. In his honor it was named the Wright Wind Tunnel.

Once they "take off" inside the giant testing chamber, model airplanes will confront all the natural flying hazards of their bigger flying brothers and then some. Wind speed twice as great as the 200 mile an hour "blows" of a West Indies hurricane will be manufactured by a huge propeller whirled by a 2,000-horsepower four-speed motor. This, designed by American engineers, is the largest motor of its type ever built.

The tunnel will reproduce, in proper ratio, variations in barometric pressure up to theoretical altitudes of 35,000 feet. It may be operated under pressures from one-fourth of an atmosphere to four times the atmosphere near the earth's surface. Cross-section dimensions of the testing section of the tunnel are six by ten feet, but it is slightly larger at the turns in order to decrease the air turbulence. It is enveloped in steel plates from $\frac{3}{8}$ to $\frac{5}{8}$ of an inch in thickness. But even the strength of steel is not sufficient to risk a maximum air pressure test of the tunnel. The tunnel was tested by filling it with water under air pressure. It was pointed out that in case a crack developed in the steel casing, the pressure behind a tunnel full of air might cause considerable damage to the Institute buildings comparable to a small tornado, in fact. This danger is averted by the use of water which reduces the terrific force of the air.

Heart of the electrical equipment in the tunnel is the main squirrel-cage-type motor which drives the propeller inside a 13-foot section of the tunnel. The tips of the propeller have less than an eighth of an inch clearance from the walls of the tunnel. Because of the temperature of approximately 200 degrees Fahrenheit developed inside the tunnel, the main motor will be air conditioned to 75 degrees by a separate 40-horsepower, motor-driven blower. The auxiliary unit will provide 12,000 cubic feet of air a minute to cool the working unit. Eleven thousand cubic feet of this air will be required to carry away the motor loss and the other thousand cubic feet will take care of heat leaking each minute into the motor from the tunnel.

"With the increasing speed and size of aircraft, our existing wind tunnels have become obsolete," the Technology Review recently stated. It added that the new M.I.T. tunnel is designed to provide a wider range of conditions than any other existing American tunnel.