It is no exaggeration to say the progress of aviation can be measured by the pace of propulsion development. This was how Pratt & Whitney founder Frederick B. Rentschler expressed it in 1925. “It seemed very definite that the best airplane could only be designed around the best engine.”
The Pratt & Whitney R-1340 Wasp was a major milestone in a stream of progress that has taken us from the Wright Brothers 28-horsepower engine to the turbofan engines of today that can produce 100,000 pounds of thrust. The Wasp would change military aviation and pioneer reliable commercial airline service, powering nearly 100 aircraft types. Many Wasps still fly today all over the world.

In the beginning, only 22 years after the Wright Brothers, it was a small team led by Rentschler that had the idea for a remarkable product. Rentschler came from an Ohio manufacturing family by way of Princeton University. During World War I he was an Army inspector at the Wright engine plant in New Jersey, building the European Hispano-Suiza engine. After the war Rentschler was invited to run the newly organized Wright Aeronautical Corporation in Paterson, New Jersey. The major project became air-cooled radial engines. At that time most engines were like auto engines, cylinders in line, cooled by water and cooling fluid like glycol. Although some were excellent performers, they tended to be heavy with the extra weight of plumbing and coolant. There were those, especially the fledging aviators of the U.S. Navy, who believed an air-cooled radial engine was an alternative. These engines would be more compact, easier to maintain without the liquid cooling hardware and also more reliable without the radiators, pipes, hoses, pumps and tanks. They could take the pounding of carrier landings.
The Navy told Rentschler that it wanted an engine even more powerful than the Wright Whirlwind, at least 400 horsepower. There would be no initial development money, but if Rentschler and his small team could build such an engine, the service would be very interested.

Through family connections Rentschler was introduced to the management of the Pratt & Whitney Company in Hartford, Connecticut. Founded by Francis Pratt and Amos Whitney, who had worked for Samuel Colt, the company was highly respected for its machine tools. Pratt & Whitney would put up $250,000, machine tools and factory space and have a 50 percent interest in the new Pratt & Whitney Aircraft Company. Rentschler and chief engineer George Mead would hold the other half. Mead had worked for Rentschler at Wright and also wished to try for something better.

Other key Wright people came to Hartford, too, including Andy Wilgoos, a brilliant engine designer. In fact, the first design work on what would become the Wasp was done in Wilgoos’ garage in Paterson, New Jersey, in June 1925. By August the garage was left behind and everyone, about 20-30 people, worked at the old Pope-Hartford automobile plant, that still smelled of Connecticut Valley cigar tobacco that had been stored in the vacant building.
This invention relates in general to air cooled internal combustion engines and more particularly to a new type of cylinder head and valve stem housing construction therefor.

To air cooled engines it is desirable practice to place the valves in the cylinder head itself and to operate the same by means of long unbroken valve stems. The rotors and push rods are sometimes inclined to provide a better flow of cooling air. In the practice of which I have been a party heretofore, the valves were separated from the head and so were the valve stems. The present invention is an improvement in the valve stem designs and the valve control systems.

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By Christmas Eve the last bolt was torqued down. To celebrate the accomplishment, everyone received a holiday turkey and celebrated. But the engine did not have a name. Later Rentschler recalled: “Dozens and dozens of suggestions were thrown back and forth within our little group. Finally, we began gravitating toward ‘bees’ as a general designation for our engine types, and according to my best recollection, my wife (Faye) suggested Wasp for the name of our first product.”

By January the Wasp was running at 425 horsepower with no glitches. “It ran as clean as a hound’s tooth and was actually just the thoroughbred that it looked,” said Rentschler. The Wasp’s combination of weight, power and durability had never before been achieved in an aircraft engine. Following Navy ground tests the engine flew on a Wright Apache for the first time on May 5, 1926. In October the Navy ordered 200 engines. That production line would run until 1960 with more than 30,000 R-1340 Wasps built. That first Wasp was followed by a long line of Pratt & Whitney piston engines – the Hornet, the Wasp Junior, the Twin Wasp, the Twin Wasp Junior, the Double Wasp and the 4300-horsepower behemoth, the Wasp Major, the largest displacement piston aircraft engine ever built. During World War II alone, Pratt & Whitney and its licensees would build 363,619 Wasp family engines.
THE HISTORY AND HERITAGE PROGRAM OF ASME

Since the invention of the wheel, mechanical innovation has critically influenced the development of civilization and industry as well as public welfare, safety and comfort. Through its History and Heritage program, the American Society of Mechanical Engineers (ASME) encourages public understanding of mechanical engineering, fosters the preservation of this heritage and helps engineers become more involved in all aspects of history.

In 1971 ASME formed a History and Heritage Committee composed of mechanical engineers and historians of technology. This Committee is charged with examining, recording and acknowledging mechanical engineering achievements of particular significance. For further information, please visit http://www.asme.org

LANDMARK DESIGNATIONS

There are many aspects of ASME’s History and Heritage activities, one of which is the landmarks program. Since the History and Heritage Program began, 259 artifacts have been designated throughout the world as historic mechanical engineering landmarks, heritage collections or heritage sites. Each represents a progressive step in the evolution of mechanical engineering and its significance to society in general.

The Landmarks Program illuminates our technological heritage and encourages the preservation of historically important works. It provides an annotated roster for engineers, students, educators, historians and travelers. It also provides reminders of where we have been and where we are going along the divergent paths of discovery.

ASME helps the global engineering community develop solutions to real world challenges. ASME, founded in 1880, is a not-for-profit professional organization that enables collaboration, knowledge sharing and skill development across all engineering disciplines, while promoting the vital role of the engineer in society. ASME codifies and standards, publications, conferences, continuing education and professional development programs provide a foundation for advancing technical knowledge and a safer world.

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Additional Resources on the Pratt & Whitney Wasp R-1340 engine:

Examples of the full range of the Wasp family of engines, including one of the original 1926 prototypes, are on display at the New England Air Museum (NEAM) in Windsor Locks, Connecticut. NEAM’s mission is to preserve, study and celebrate Connecticut’s incredible aerospace legacy, including the ongoing contributions made by Pratt & Whitney over the past 90 years.

For more information visit www.neam.org