

The "Impossible" *Marauder*

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BY NOW IT HAS BEEN PRETTY WELL ESTABLISHED that you can't judge one type of airplane by the requirements for another, any more than you can criticize a sonnet by the criteria for an epic. The corollary of this is that, to judge either a plane or a piece of literature, it is necessary first to study its purpose and then to discover how near it comes to accomplishing that purpose.

For this reason the Martin B-26 *Marauder* is one of the outstanding planes of this war. It set out to do the "impossible" and is doing it every day on fighting fronts all over the world.

While Hitler was arming Germany unimpeded, this country was living under the reign of pacifism. Trusting to the protection of the seas, we built only a relatively small air force. Then came the invasion of Poland and the Lowlands, arousing us to the fact that our security rested not on our oceans but on the strength of our air power. We needed many more bombers—dive bombers for naval offensive action, light bombers for cooperation with land troops, heavy bombers for long-range striking power, and—what we had entirely neglected—medium bombers to fill a tactical role.

In 1939, therefore, the Army asked The Glenn L. Martin Company to design them a medium bomber which would supplement our *Liberators* and *Flying Fortresses* by combining the long-range and heavy bomb load of the heavy-duty bomber with the speed, maneuverability and firepower of the fighter. It was an assignment to give pause to the most courageous aircraft designer, but immediately several of the Martin engineers set to work. Among them was the nonconformist, Peyton Magruder.

AS USUAL, the plane which Mr. Magruder came up with defied many of the accepted ideas about plane design. He believed that he could design a bomber and fighter in one by doing away with the conventional sturdy build of bombers. Therefore, he streamlined the fuselage of his plane and gave it short-spanned wings, that it might rival fighters in speed and maneuverability. And, that the plane might carry an ample load of bombs and other armament and a good supply of gasoline, he built it around two

of our newest and most powerful engines, Pratt & Whitney *Double Wasps*, providing a total of four thousand horsepower.

The incorporation of fighter characteristics into a bomber could not, of course, be done without compromises. Every plane represents a multitude of compromises, and the B-26 is no exception. In general, however, the compromises involved in the B-26 are not so much between streamlining and load as between streamlining and ease of piloting. Our heavy bombers had been designed to give the pilot a large amount of leeway in handling the plane. Martin engineers had faith that our pilots were good enough to handle a more delicately balanced plane and, that once they had the feel of it, they would be glad of its extra speed and maneuverability in combat.

When Glenn Martin looked at the designs he saw almost at a glance that these revolutionary ideas would work and would give the Army one of its most efficient planes. Many of the Air Corps officers were definitely sceptical, however, saying that the plane could never even takeoff. But gradually, after studying it, they began to change their minds and finally decided to choose it, designating it the B-26. In fact, so convinced were they of its merits that they ordered a prototype and hundreds of production planes at the same time.

SINCE MARTIN'S MAIN PLANT in Baltimore was already working full tilt, with large new additions being made to take care of the increasing orders for attack and patrol bombers from the French and British, the Army, and the Navy, an entirely new plant was needed for the B-26's. Accordingly, plans were drawn up, and ground was broken about a mile from Plant 1, in November, 1940. The next April the first workers moved into the unfinished plant. From then until September construction and production went on simultaneously, though conditions were far from ideal. For instance, during all that time there was no running water, so that every ounce used at Plant 2 had to be carried over from Plant 1. But B-26's were more urgent than water.

When finished, Plant 2 almost doubled

the floor space of the company. Although it was built with two floors to be more compact, with the various sections more accessible to each other, it's still a long walk from one end of the plant to the other. The forgings and sub-contracted parts come in from a low ground level to the first floor, where the machining is done and the 25,000 parts are assembled into 650 minor sub-assemblies. From there they are hoisted by cable up to the second floor, where in turn they are assembled into 32 major sub-assemblies and then into the final plane. At the end of the assembly line the planes are painted and rolled outside to an upper ground level, ready to fly except for one very necessary item—the propellers.

This plant gives a good indication of what Hitler is up against from this country in the battle of production. Two years ago production was just starting on the B-26 without even a full-scale model in existence. By last summer *Marauders* were taking part in the battle of Midway, today they are in constant action in the southwest Pacific, the Aleutians and Africa, and every day more are streaming out of the large building for use in tomorrow's battles.

CAREFUL PLANNING, foresight, willingness to take chances, and just plain hard work have been responsible for this miracle of production. Together the engineering, tool design and manufacturing departments, with their experience in quantity production methods, devised a comprehensive plan whereby the greatest possible number of people could be working on the B-26's at one time.

The system of minor and major sub-assemblies, allowing several people to work on contingent parts at the same time without interfering with each other, is one of the main features of this plan. It means, however, that close tolerances must be kept. For instance, a man working on a small part of the tail may not see much resemblance between the part he is working on and an Army bomber, but somewhere down the line a B-26 may be missing its tail if he doesn't meet his specifications, which often permit only a thousandth of an inch variation.

Another important part of the plan was the simplification of jobs. This, too, di-