Maxim Machine Gun

A revolutionary advance in weaponry

BY **BARRETT TILLMAN**

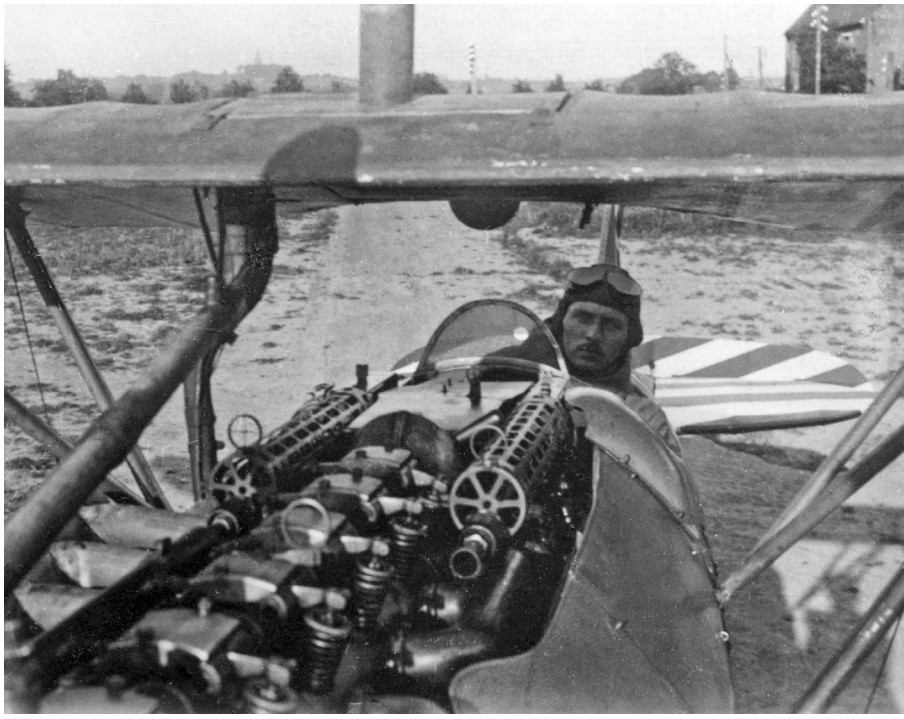
If you do an Internet search for "chattering Spandaus," you only get 89 hits, but that stock phrase has become synonymous with World War I aviation. Generations of moviegoers have seen the image: the leering Teutonic ace, hard eyes gleaming behind squared-off goggles above the blazing muzzles.

The fact is that there is no such thing as a Spandau machine gun (or *Maschinengewehr* in German). Nearly all German fighters of the Great War were armed with Maxim designs, and the fact that some were produced in the armory at Spandau led to the misnomer.

Of even greater import is that the weapon was designed by an American-turned-Briton, Sir Hiram Maxim.

Maxim was a passionate inventor, best known for his electric lights (as a rival to those of Thomas Edison). Maxim's business took him from Massachusetts to London so often that he settled there in 1900, becoming a citizen of the United Kingdom. He was knighted the following year.

By then, the former Yankee had revolutionized warfare. In the Victorian era of hand-cranked Gatling guns, the recoil-operated, belt-fed Maxim machine gun represented a huge technological advance. The basic Maxim gun, patented in 1883, was demonstrated in Maxim's garden the next year, churning out 500 rounds of .303 ammunition per minute. The heat produced by the high rate of sustained fire was dissipated by a water jacket surrounding the barrel.



German pilot Ernst Hamscher of *Jagdstaffel* 37 looks down the perforated jackets of the twin MG.08s (popularly known as "Spandaus") fitted to his Albatros D.III. Though this view almost appears as though it came from a Hollywood film like *Dawn Patrol*, it was taken on the Western Front in 1917. (Photo courtesy of Greg Van Wyngarden)

Nearly a decade passed before the wonder weapon was used in combat, deployed against Rhodesian tribesmen in 1893. Thereafter, Maxims became a standard tool in Britain's colonial feuds. A bit of doggerel declared, "Fear not for we have got…the Maxim gun…and they have not."

Maxims were widely purchased, frequently equipping navies, as well as armies, in the transitional era when "fighting tops" of warships were still considered useful for sweeping the decks of enemy sailors.

Maxim also dabbled in flying machines. His father had proposed a twin-rotor helicopter but lacked an adequate engine. During the 1870s and '80s, Maxim experimented without success, owing to the weight of bulky steam engines.

Aerial War

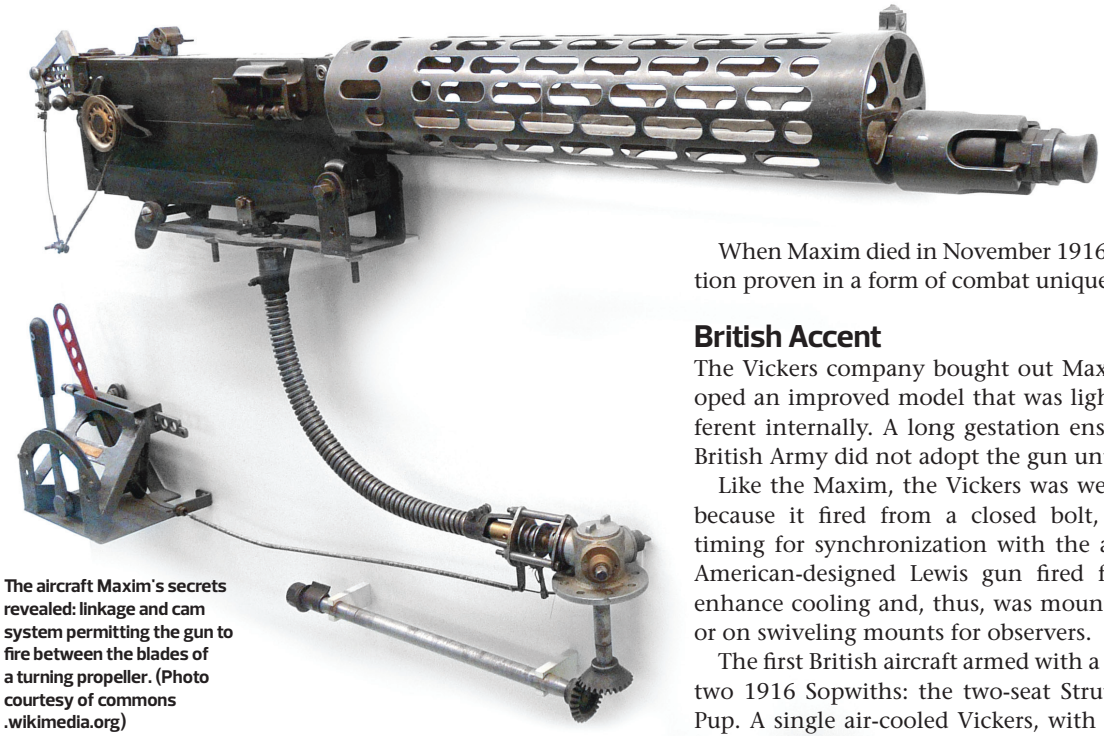
The "Spandau" appeared in Germany in 1908, designated the MG.08, chambered in the 7.92mm rifle cartridge. Derived from the developmental MG.01, the "aught eight" became one of Germany's iconic weapons in the era of the K.98 Mauser rifle and the P.08 Luger pistol.

When Europe immolated itself in 1914, every army had machine guns (mostly of Maxim design), but war elevated them to the third dimension. Observation aircraft often carried machine guns, but the front-mounted propeller on "tractor" designs got in the way. Air arms produced "pusher" designs to provide an unobstructed forward-firing capability but posed serious airframe limits.

The intermediate solution entered aviation lore: France's famed prewar pilot Roland Garros fixed steel plates to his Morane monoplane's propeller, deflecting the rounds that struck the prop. It worked long enough for him to down three German aircraft in April 1915. He was then forced down in enemy territory, and his "secret" was revealed.

Legend claims that Dutch designer Anthony Fokker examined Garros's arrangement and quickly designed an interrupter gear composed of cams and levers, permitting a Maxim to fire forward through the prop arc. Actually, Swiss inventor Franz Schneider had patented the concept in 1913. But his design remained untested, leaving the field to Frenchman Raymond Saulnier the following year. Saulnier's design probably was sound, but the French Hotchkiss gun proved erratic, and ammunition issues intruded. Thus, Tony Fokker had the stage to himself.

In early 1915, the German Air Service succeeded with MG.08s bolted to Fokker *Eindecker* monoplanes. The weight



The aircraft Maxim's secrets revealed: linkage and cam system permitting the gun to fire between the blades of a turning propeller. (Photo courtesy of commons .wikimedia.org)

of a heavy cooling jacket and water was avoided by holing the jacket to enhance airflow across the barrel. Fed by a 500-round belt, the gun made the E.I and later models the first "system aircraft" because the weapon was more significant than the platform. The E.IV mounted two Maxims (unsuccessfully three), but the extra weight posed a major concern.

Armament affected the performance of aircraft with 80- to 110-hp engines. The basic Maxim weighed about 24 pounds, with 500 belted rounds and an ammunition box running about 30, while the synchronizing gear could add six more. Those items totaled 60-plus pounds, assuming no optical sight or round counter.

The spring and summer of 1915 was, nonetheless, the era of "The Fokker Scourge." With the advantage of aiming the entire aircraft rather than swiveling the guns, the first German *Jagdfliegern* cut a wide swath through Allied formations. The *Eindecker*'s wing-warping control system limited maneuverability versus aileron aircraft, but the gun made a huge difference.

A generation of German airmen earned the coveted *Pour le Mérite* on Maxim-armed *Eindeckers*. The first two, Lieutenants Oswald Boelcke and Max Immelmann, became international celebrities. Boelcke even was interviewed by The New York Times almost a year before the United States entered the war.

Immelmann died in confused combat in June 1916, either a victim of synchronizing-gear failure or a British gunner who connected with his propeller. Boelcke ran his score to 40 before dying in an Albatros that October.

Other Fokker exponents ran up impressive tallies: Kurt Wintgens and Max Ritter von Mulzer scored in double digits, while six others became *Eindecker* aces. Wintgens, who wore glasses, was a serious talent but fell victim to the appeal of twin guns on his E.IV when interim Fokker and Halberstadt biplanes only carried one Maxim. In September 1916, he learned that the *Eindecker* could not compete with France's new SPAD VII.

With better aircraft—especially Nieuports—the Allies regained air superiority over the Western Front for a time. But Germany countered with the lethal Albatros series of fighters, featuring twin "Spandaus" that led to "Bloody April" of 1917.

When Maxim died in November 1916, he had seen his invention proven in a form of combat unique to the 20th century.

British Accent

The Vickers company bought out Maxim in 1896 and developed an improved model that was lighter and somewhat different internally. A long gestation ensued, however, and the British Army did not adopt the gun until 1912.

Like the Maxim, the Vickers was well suited to aircraft use because it fired from a closed bolt, permitting consistent timing for synchronization with the aircraft's propeller. The American-designed Lewis gun fired from an open bolt to enhance cooling and, thus, was mounted atop biplane wings or on swiveling mounts for observers.

The first British aircraft armed with a synchronized gun were two 1916 Sopwiths: the two-seat Strutter and the delightful Pup. A single air-cooled Vickers, with the water jacket perforated differently than the Maxim, performed just as well with different synchronizers.

All Allied air arms used .303-caliber Vickers during the war, with two-gun fighters emerging in 1917: the Sopwith Camel and SPAD XIII.

One Vickers improvement for aircraft use was the disintegrating ammunition belt. The steel links securing each

Otto Parschau (in helmet and goggles) was an early German ace who contributed greatly to the so-called "Fokker Scourge," achieving eight victories before his death in July 1916. Here, he tries out of the cockpit of a Pfalz E.I, another early monoplane fighter fitted with a single MG.08. (Photo courtesy of Greg Van Wyngarden)

cartridge automatically dropped away when the round was chambered. Available starting in 1917, the disintegrating belts largely avoided cloth belts' tendency to ice up or warp from repeated use.

Additionally, 10mm Vickers were used against German observation balloons, as the larger bullet carried far more incendiary material to ignite the hydrogen in the balloons.

The Vickers was eventually employed by at least nine other nations, usually chambered in their own cartridge in the 6.5 to 7.6mm realm.