

The toggle lock in battery. Like the human knee, it will remain locked until pivot II is raised above the axis between pivots I and III.



Sir Hiram Maxim (standing) pointing to the toggle lock system in his hands which was the key mechanism to his Maxim Machine Gun.

A LUGER SHORT STORY

by John Eckert

The story of the Luger pistol really begins, as does that of nearly all self-loading cartridge arms, with the development and refinement of smokeless gun powder in the late 1800's. By 1890, smokeless propellants were becoming reliable enough to tempt skilled weapons designers to try their hand at military field pieces, shoulder weapons, hand guns, and the blending of the last two usually referred to as pistol-carbines.

One of the mechanisms that intrigued American designers especially was the toggle lock. The original Volcanic pistol was locked with a toggle mechanism, John M. Browning experimented with it, but the most successful to use the idea to facilitate a recoil operated firearm was Hiram Maxim. Born in Sangerville, Maine in 1840, Maxim moved to England in 1883 and continued experiments on a fully automatic firing machine gun, which evolved into the famous weapon that bears his name and which revolutionized the nature of warfare. He was knighted by Queen Victoria in 1901 for his contribution to British military successes.

Another American who came to see the possibility of using the toggle lock principle was Hugo Borchardt. Born in Magdeburg, Germany, in 1844, he immigrated with his parents to the United States around the time of the Civil War, worked for Pioneer Breechloading Arms Co. and Singer Sewing Machine Co. as shop foreman and machinist, and was hired by Winchester in 1873. He became a US citizen in 1875. He is credited with being instrumental in the development of the Winchester revolver, which was never produced. He moved on to become factory superintendent of the Sharps Rifle Company in 1876 and secure his name in American gun making history with the Sharps-Borchardt falling block rifle. Professional frustration led him back to Europe in about 1882 to become director of the Fegyver es Gepgyar (Small Arms and Machine Factory) in Budapest, Hungary. Although operated by the Hungarian government, this entity was a part of the Ludwig Loewe industrial empire, based in Berlin.¹

Borchardt held that position until 1890. During that time Hungary was extensively testing the Maxim ma-



Hugo Borchardt, 1844-1924.



One of the Winchester experimental revolvers credited to Borchardt.

chine gun in its successful form. Borchardt, like Maxim a demonstrably talented firearms designer and inventor, apparently put the proverbial two and two together and worked to design nothing less than a recoil operated, self loading pistol incorporating the breech locking toggle principle of the Maxim.

Borchardt was successful. His invention, designated the Construction 93 (C 93 for short) in the nomenclature used at the time, was patented in Germany, England, and elsewhere in Europe in 1893 and in the USA in 1895. He tried to interest several firearms manufacturers, including

(No Model.)

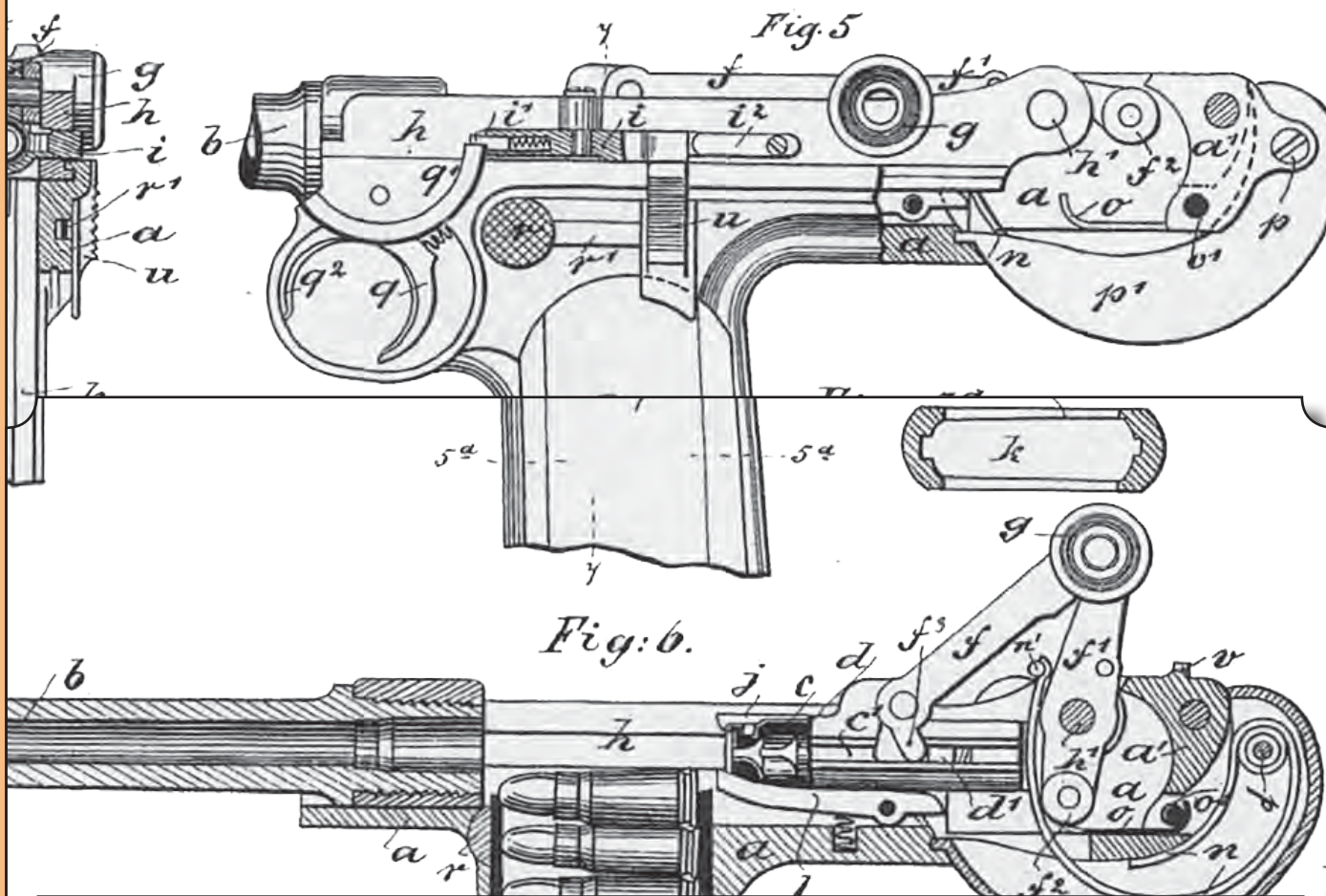
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H. BORCHARDT.
RECOIL MAGAZINE PISTOL.

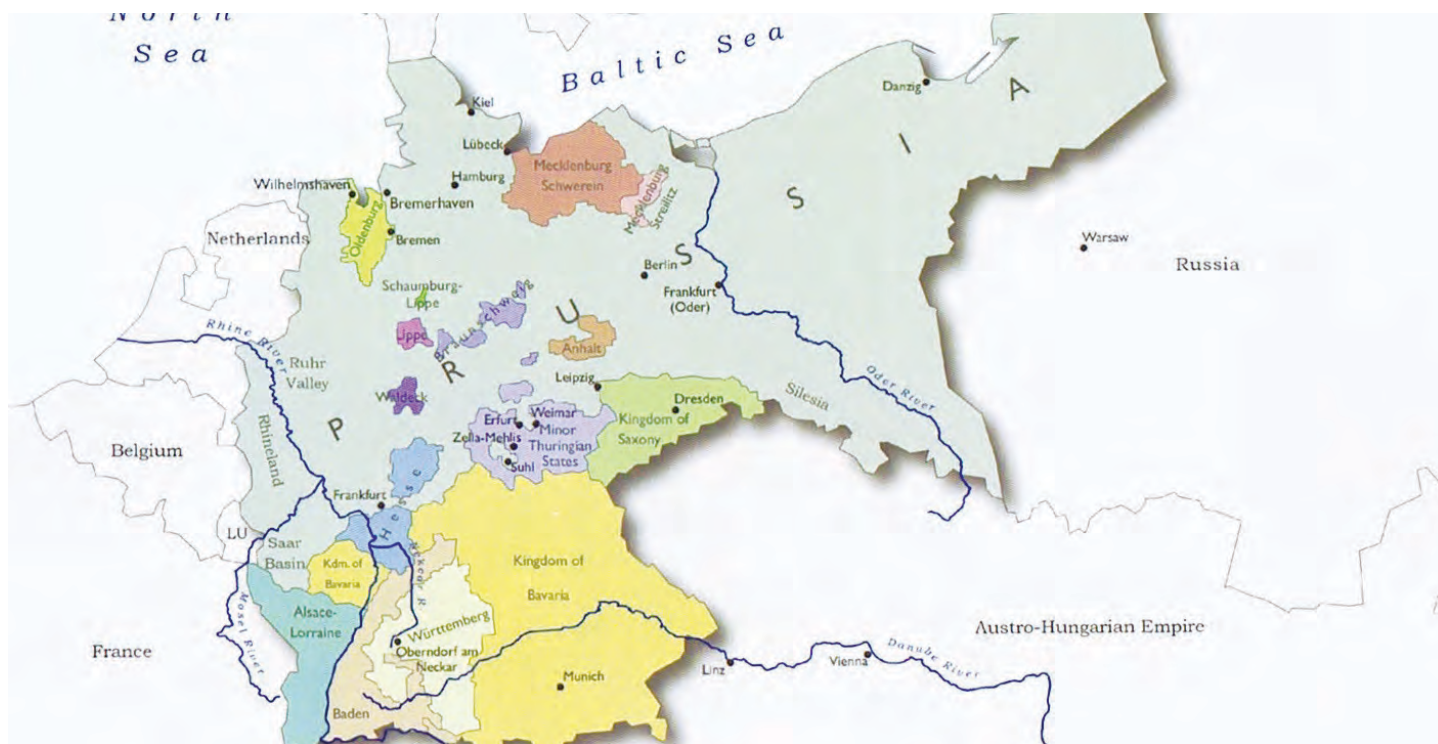
No. 571,260.

Patented Nov. 10, 1896.

Borchardt's U.S. patent, dated Nov. 10, 1896.



The Borchardt C93 Automatic Pistol.



A rendering of Imperial Germany by cartographer Tim McCarthy.

Fabrique National in Belgium, in producing the novel pistol, but the only taker was the Ludwig Loewe firm in Berlin. Loewe was a competently run, broadly based manufacturing company that got into the arms business extensively in the 1880's. They hired Borchardt as a consultant and began production of his pistol in 1894.

The Borchardt C 93 was remarkable piece of work in every sense. It was the first functionally successful handgun to incorporate such features as a fully locked breech, recoil operated automatic reloading, and cartridges stored in a detachable magazine inside the grip. When properly tuned and furnished with consistent ammunition, it performed very well in various tests by military and civilian entities in the late 1890's.

The success of the C 93 is attributable to several factors: the soundness of its basic design, the quality and precise skill of the machinists who built it, and the cartridge it fired. Borchardt was quoted as saying that he could not move forward with the design of the pistol until he (sic) had materialised a cartridge capable of withstanding the entirely novel conditions imposed by automatic loading.² This statement is certainly true, but the design of the 7.65 m/m Borchardt cartridge is generally attributed not to Borchardt himself but to the next player in the story, Georg Luger.

Luger got involved in the story of his namesake pistol ear-



Georg Luger, 1849-1923. as a military officer, designer/inventor at DWM, and honored senior.

ly on. Born in Steinach, Austria, in 1849, he went to a privileged business school in Vienna, worked as a bank clerk, and became a cadet and later officer in the Austrian army. He was listed in the Viennese trade register in the late 1880's as a "Waffentechniker"³ (weapons technician), probably based on skills he learned in the military. He moved to Berlin in 1891 and became essentially a traveling salesman for the Ludwig Loewe firm, knowledgeably demonstrating arms that Loewe was offering in various



The Ludwig Loewe factory in 1902.

countries. It was he who demonstrated the Borchardt C 93 to the U.S. Navy in 1894, and to the Swiss military authorities during the first of their handgun tests in 1897. Luger was a competent linguist and an accomplished marksman, as well as a former officer, credentials which did him no harm when working with the military.

As noted above, the C 93 performed well in nearly all of its tests and was fascinating to the officers and civilians who were exposed to it. It was, however, a bit cumbersome, complicated in construction and the reliability of its finicky mainspring, awkward to fire from the hand, and even with its stock was not robust enough to serve as a pistol-carbine for military use. Borchardt, who had no military background, never really understood this, but Luger did. He was assigned to work on improving the design when Borchardt refused, the latter declaring the gun to be perfect as is.

In 1896 Loewe merged its arms making plant in Berlin with an ammunition maker from Karlsruhe—Deutsche Metallpartonnenfabrik—to form Deutsche Waffen und Munitionsfabriken, or just DWM, as it is commonly known. The new company, whose arms production remained in Berlin, was keen on marketing the C 93 to militaries anywhere, but was aware of its shortcomings.

Acting on the opportunity, DWM sent Luger to demonstrate the C 93 to the Swiss testing commission in Thun, Switzerland in June of 1897. The Borchardt was judged to be too heavy, complicated, and awkward for service use though it performed well in firing trials. In late 1897 the Swiss did another series of tests, to which DWM submitted an “improved Borchardt.” It too was unsuccessful, and no example of this pistol, whatever it was, has ever been found.⁴

Undeterred, the Swiss authorities scheduled a third series of pistol trials for October of 1898, again at Thun. The DWM submission was to be the “improved Borchardt” which was rejected the year before, but prior to any actual firing tests, they were allowed to substitute two versions of a new pistol which was called the “Borchardt-Luger.”

Luger had been working on the Borchardt to overcome its weaknesses. The result was the elegant Versuchsmodell III as the Swiss called it, the third model trials pistol from DWM (the two rejected Borchardts being I and II) and the oldest surviving true Luger. As can be seen, the changes from the C 93 were dramatic. The pistol is smaller, more compact and 11 ounces lighter. The awkward overhanging mainspring housing is gone, the spring having been relocated in the rear of the grip. The grip angle to the bore axis—55 degrees—is nearly ideal for instinctive pointing, and has been used by many subsequent inventors/designers. An automatic (or grip) safety replaced the manual safety. The 7.65 m/m Borchardt cartridge was shortened to fit in the angled grip and renamed the 7.65



The Versuchsmodell III (third test model), S/N 5, submitted to the Swiss in October, 1898. It is the oldest surviving Borchardt-Luger.

No. 753,414.

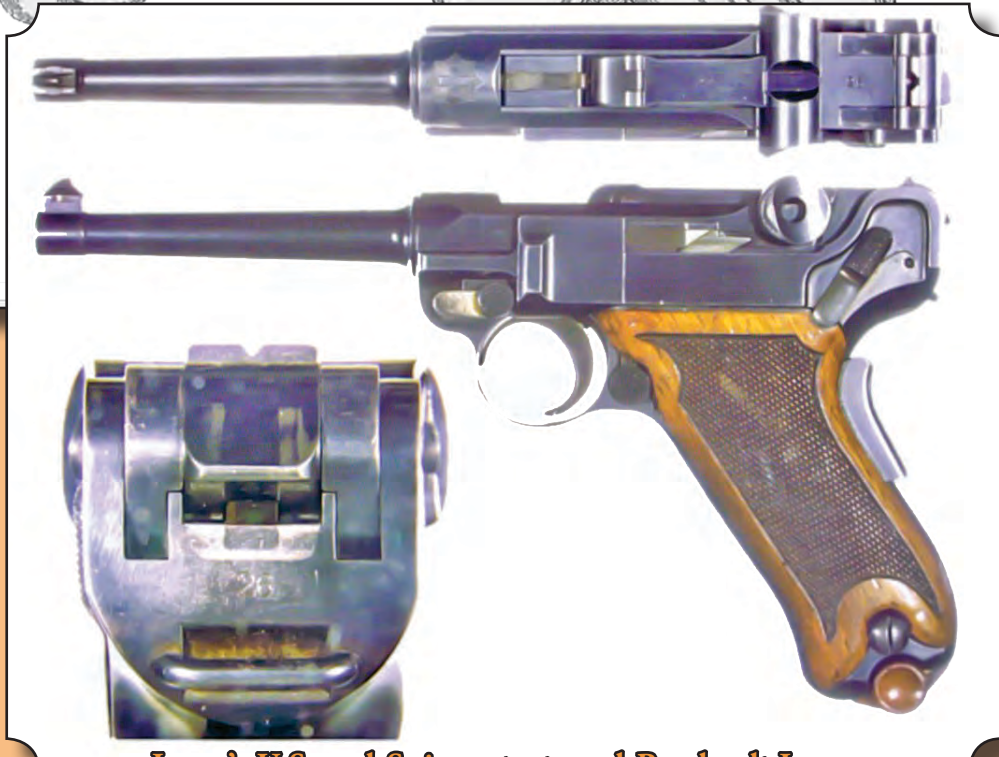
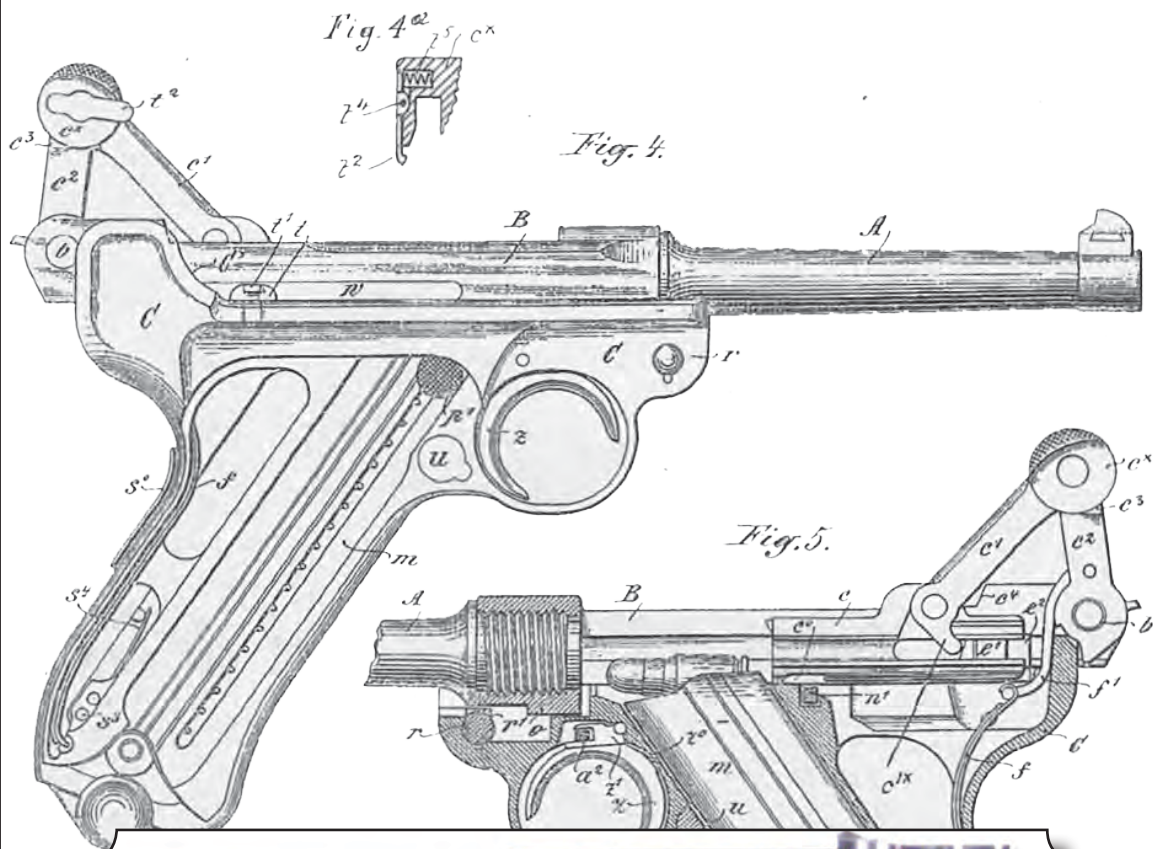
PATENTED MAR. 1, 1904.

G. LUGER.
RECOIL LOADING SMALL ARMS.

APPLICATION FILED MAR. 17, 1900.

NO MODEL.

10 SHEETS—SHEET 3



Luger's U.S. and Swiss patents and Borchardt-Luger S/N 26. This pistol was prepared for Swiss field trials and later submitted to the British.

m/m Parabellum. The Swiss were very pleased with the gun, and asked DWM to reduce the weight more if possible and restore the manual safety. This was done, and a number of pieces were sent to Switzerland in 1899 for troop trials. The final result was adoption of the production version as the service pistol for issue to officers and some NCO's by the Swiss Parliament on May 4, 1900.

As Shakespeare put it, "What's in a name?" The Swiss order was for the "Pistole, Ordonnanz 1900, System Borchardt-Luger." The earliest DWM manual in English describes the "Parabellum Automatic Pistol, Borchardt-Luger's System, Swiss Regulation Pattern 1900." The word "parabellum", which was incidentally DWM's telegraph code address, derives from a Latin saying "Si vis pacem, para bellum," or "if you wish for peace, prepare for war." DWM literature nearly always refers to the pistol as the Parabellum, as does most of the world to this day. We Americans generally use the term "Luger" because we were introduced to it that way; DWM's marketing agents in the U.S.—Hans Tauscher, 1890's to 1917 and A.F. Stoeger, 1920-1940—consistently refer to the pistol by the inventor's name in their advertising and manuals, as did Tauscher in his efforts on the gun's behalf with the U.S. Army in 1901 and 1907. Stoeger even copyrighted the term "Luger" as it applied to a pistol in 1929, an act that caused some marketing difficulties in the U.S.A. for later manufacturers (see below). U.S. troops returning from World War I brought back Lugers, not Parabellums.

In the period from 1904-1906 the Luger underwent several significant mechanical changes. These resulted partially from Luger realizing there was a better way and partially from input from military testing officials in various countries and field experience. A coil spring replaced the original leaf mainspring, the gripping knobs on the toggle were reshaped and fully checkered, the extractor was modified to serve a dual function as a loaded chamber indicator, and the toggle anti-bounce lock was eliminated as superfluous. Guns with these features are known as the "new model," while those in the original configuration are, logically, the "old model." The change was evolutionary and several developmental prototypes and short run transitional production versions exist.

A parallel function of the development described above was tuning the Luger action for a 9 m/m cartridge. Several of the militaries testing the Luger for possible adoption were interested in a larger caliber than the 7.65 m/m. Luger responded by simply straightening the case of the

latter cartridge, which was a handy 9 m/m in diameter to start with. The result was the 9 m/m Parabellum, or 9 m/m Luger as it is usually called in this country, probably the most successful self-loading cartridge ever developed and of course still in use worldwide. One advantage of this development strategy is that a Luger can be converted from 7.65 to 9 m/m by simply replacing the barrel; all other parts, including the magazine, theoretically work with either cartridge.

While on the subject of cartridges, note that all factory produced Lugers from 1900 to the present were in either 7.65 or 9m/m caliber with two famous exceptions. Luger and DWM were encouraged by the U.S. Army and Hans Tauscher to develop a Luger in .45 caliber for the U.S. Army tests in 1907 and did so. The Luger performed well in the tests, but lost out to the Colt and Savage entrants. Only two examples are known to exist. In the early 1920's, DWM/BKIW produced a prototype "pocket" model, two each in .32 and .380 ACP. It proved too costly to produce profitably, and only one example survives.

Encouraged by its success with the Swiss contract, DWM began aggressive marketing of the Luger both commercially and to the militaries of Europe and the Americas. Over 70,000 old and new model commercial guns were made before 1914, as well as significant military sales to Switzerland, Bulgaria, the Netherlands, Portugal, Brazil, and even the U.S.—1000 old models in 7.65 m/m (or .30 Luger) for field tests in 1901. DWM's heart's desire was adoption of their pistol as service issue by a major country, and this was achieved—the German (Prussian) Navy adopted the pistol in 1904 and, the top prize, the Army in 1908.

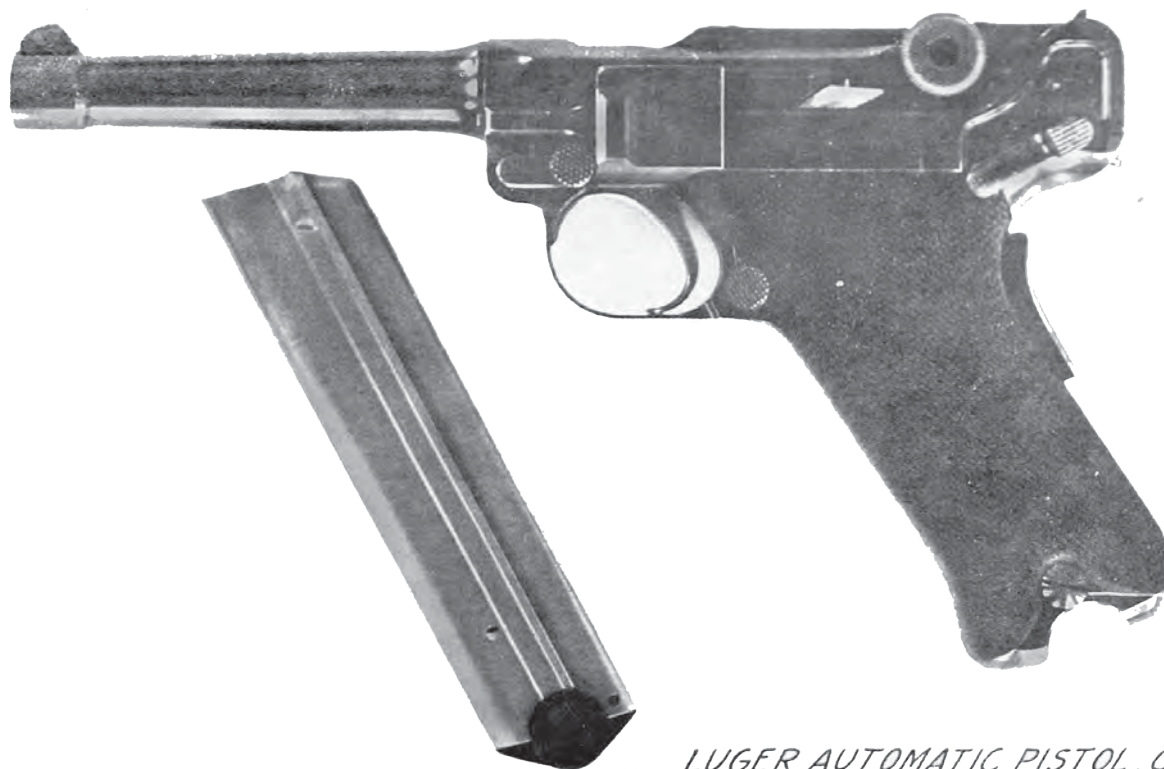
Prussia was the dominant state in the German federation at the turn of the 19th/20th centuries; of the other states, only Bavaria was large enough to have significant input militarily. Wilhelm II was the King of Prussia and was chosen by the other states as German Emperor for situations that required Imperial action. One of these was acquisition of military weapons. The Prussian *Gewehr-Prüfungskommission* (GPK), or small arms proving commission, which was staffed by the Army, had been looking for a replacement for the Revolver model 83, and favored a self-loading design. After several years of testing submissions by various manufacturers and inventors—including Mauser and Bergmann—the Luger was finally approved in 1904. The army was having budget problems at the time but the Navy was not, and the latter issued a contract



7.65 m/m Borchardt cartridges and cartons. Note that U.S. manufacturers labeled some later boxes for the 7.63 m/m Mauser and added "FOR BORCHARDT AND MAUSER AUTOMATIC PISTOLS."



The first production Luger pistol, S/N 1.



LUGER AUTOMATIC PISTOL, CAL. .45

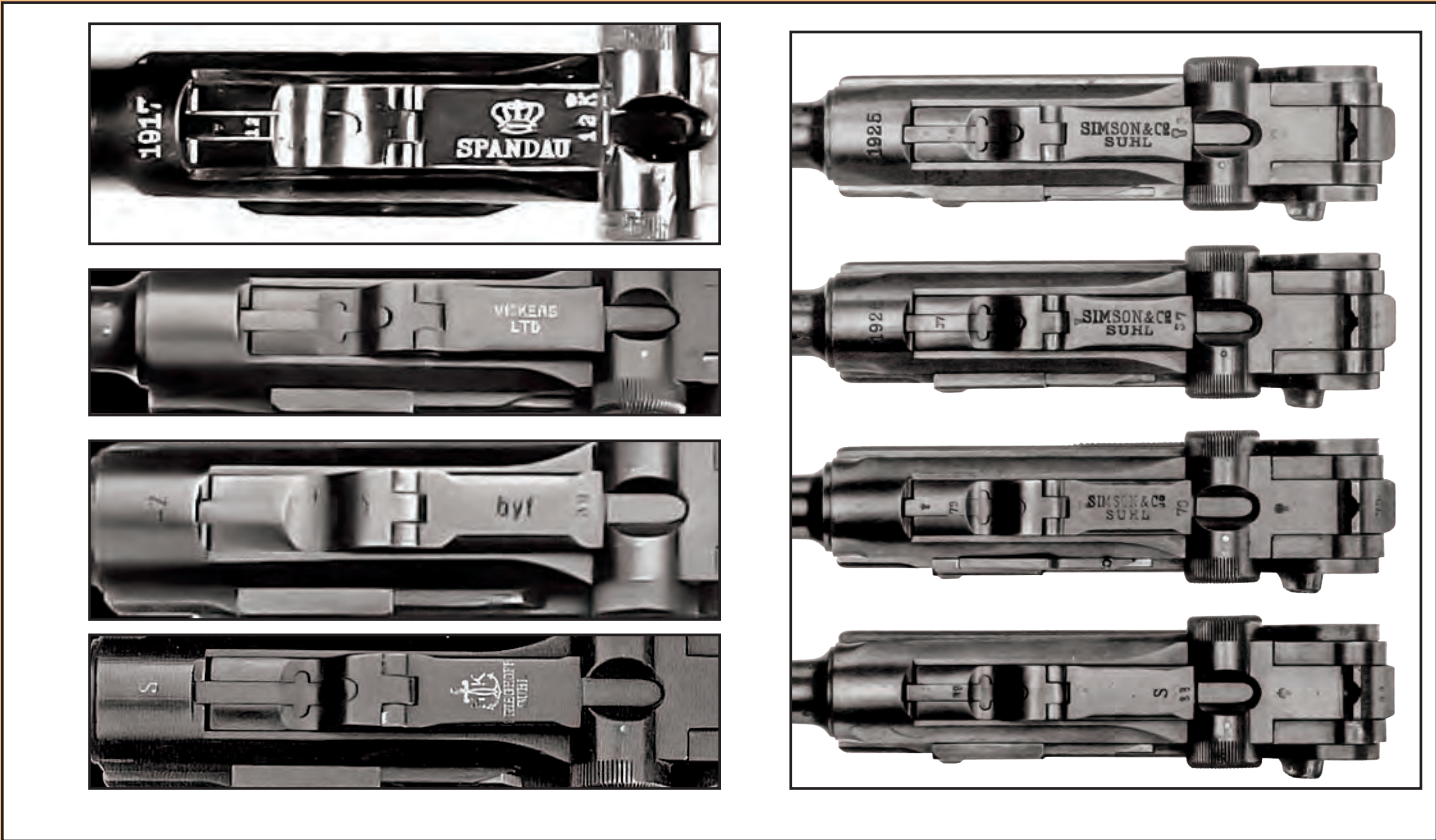
**The official U.S. Ordnance Department photo of the
.45 caliber Luger used in the 1907 tests.**



**The Marine Modell 1904, or MM 04, adopted by the
Prussian Navy in that year.**



The Pistolet 1908, or P 08, adopted by Imperial order in that year.



The toggle markings of various manufactures.

for 8000 new model Lugers in 9 m/m, known as the Marine Modell 1904 or MM 04, in December of that year. Delivery was slow, as new model tooling and production techniques were just being finalized.

Four years of financial and political (as regards the choice of a new pistol) maneuvering followed, but the Luger was finally formally adopted for the Army by Imperial order on August 22, 1908 as the "Pistole 1908," or simply and universally P 08, also in 9 m/m Luger. As a side note, P 08 became a common name for Lugers in the basic military configuration, whether military or commercial in origin, and remains so to this day.

In 1908, only DWM was tooled to manufacture Lugers, but the Royal Small Arms Factory in Erfurt was directed to tool up to become the primary supplier of P 08's to the Army with DWM secondary. DWM would continue to supply the MM 04 to the Navy under contract since the needs of that service were much smaller and the specifications different. The Erfurt factory, however, was heavily involved in production of rifles as well and never could match DWM's output. By the end of World War 1, DWM had produced nearly half again as many military Lugers as Erfurt.

The German Army had been searching for a weapon that could provide the longer range performance of a carbine, yet be lighter and easier to carry for the infantry. A Bavarian officer named Adolf Fischer, on assignment to the GPK, was in charge of a group researching this idea, and after adoption of the P 08, he approached DWM with enquiry about a pistol carbine based on the P 08 design. The result was the Lange Pistole 08 (LP 08), adopted by Imperial order in June of 1913, and production of which began in 1914. The LP 08 had the standard P 08 action with a 20 cm barrel (P 08 barrels are 10 cm), adjustable front and rear sights, and was issued with a holster/stock arrangement that was carried with a shoulder strap. From 1917 on, it was frequently issued with one or more 32 round drum magazines as well as the standard 8 round used by all Lugers then and now.

Production through the end of the Great War was all in Germany and can be estimated as follows:



The DWM factory in the Wittenau district of Berlin, circa 1910

DWM

Commercial production, including foreign military contracts, test pieces, prototypes, etc.: 114,507
German military contracts:

P 08,	588,000;
LP 08,	155, 000;
and the Navy MM 04,	<u>52,700</u>
Approximate total:	910,207



The Royal (Prussian) Small Arms factory at Erfurt before WW 1.

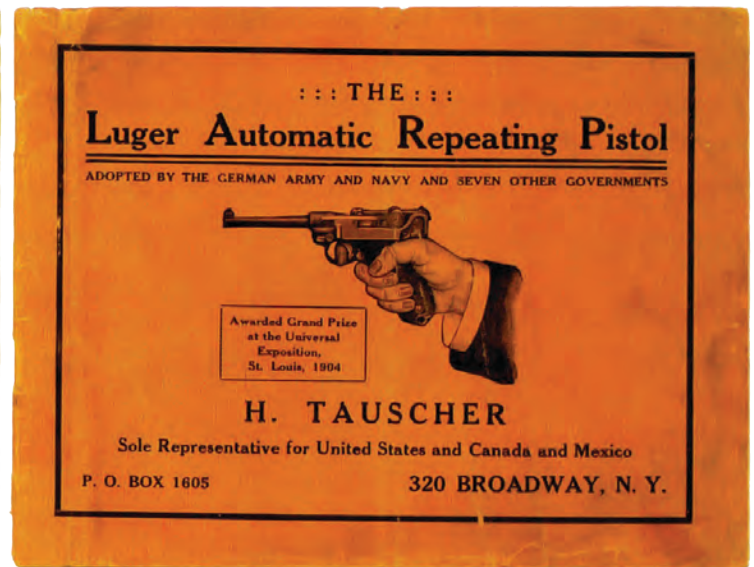
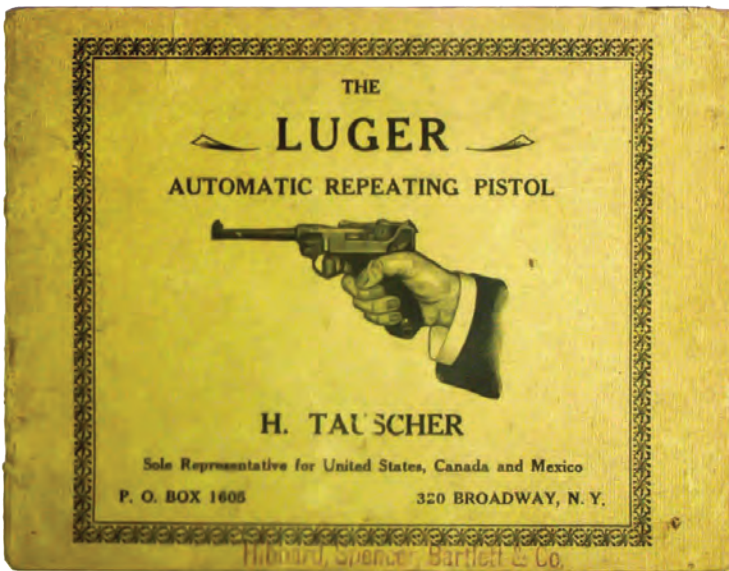
ERFURT

P 08,	496,000;
LP 08,	<u>23,000</u>
Approximate total:	519,000

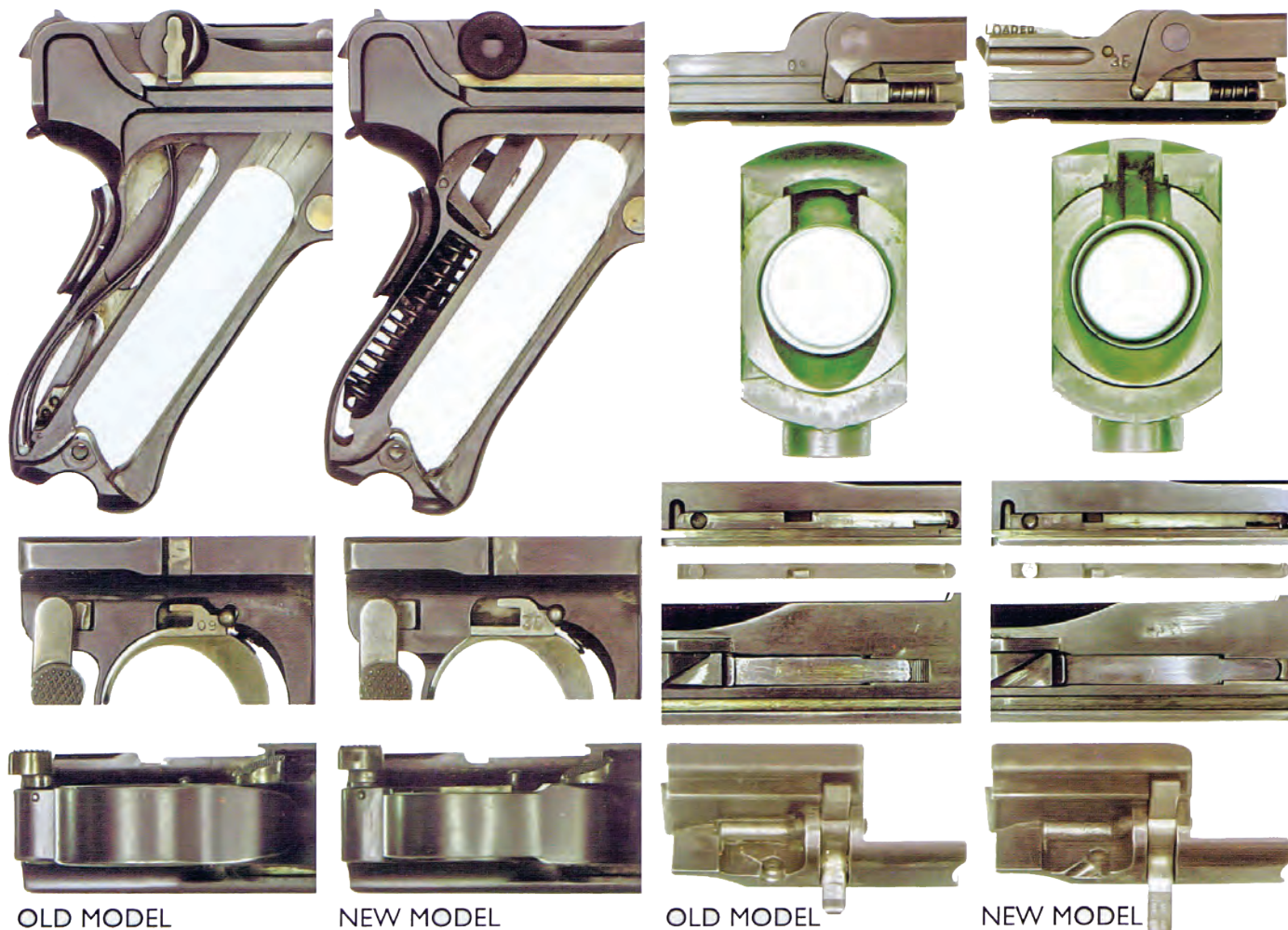
The period from 1918-1933 was one of economic and social chaos in Germany, and of course this had its effect



The earliest known Luger manual, early 1900, which oddly exists only in English.



Manuals by Hans Tauscher, circa 1910.



Illustrated changes from the old to new models.

on the story of the Luger. DWM had been able to quietly supply some P 08s to the German police and army after the war, and send some commercial guns overseas (especially to the USA), but once the International Military Control Commissions (IMKK) began their work in February 1920, it became difficult at best. DWM was not to be reestablished as a war industry; the company was renamed Berliner/Karlsruhe Industrie Werke (BKIW), and they were permitted to produce commercial guns—supposedly only in 7.65 caliber, though many in 9m/m exist—and primarily for export, but were not allowed to accept foreign or domestic military orders. These restrictions were lifted in 1927 when the IMKK departed and countries like Holland could again order guns, but recovery was sluggish.

From this point—cessation of hostilities in 1918—it is simpler to trace the Luger’s history by examination of the other factories that made them besides DWM/BKIW and Erfurt. Therefore, in chronological order:

**THE ROYAL SMALL ARMS FACTORY,
 SPANDAU, GERMANY 1918**

P 08s exist marked by the Spandau factory, all but 1 dated 1918. Spandau furnished inspectors for all the DWM contracts and knew the gun well. The surviving guns are assembled from surplus Erfurt and DWM parts with additional inspectors marks not found on either of those guns; Spandau had no production machinery. The authenticity of the guns is controversial, and some fakes exist. Fewer than 200 were assembled.

**THE FEDERAL ARMS FACTORY (W+F)
 IN BERN, SWITZERLAND 1918-1946**

Realizing that Luger’s patents had expired, the Swiss decided to make their own Lugers. Production started in 1918; the gun, called the 1900/06 W+F, was a precise copy of the last contract deliveries from DWM in 1914 (which were called the 1900/06). In 1929, the pistol was redesigned to reduce manufacturing costs. The new gun

was called the 1906/29 W+F; it's still a Luger, and nearly all parts will interchange with earlier new model guns, but it looks a bit strange. About 48,000 Lugers were made at the W+F, all in 7.65 m/m caliber except for some experimental and special orders in 9 m/m.

VICKERS, LIMITED, CRAYFORD, ENGLAND 1921-1922

In the early 1920's, the Dutch were in need of additional Lugers for their Indies Army, but, like the Swiss, were stymied by IMKK restrictions on DWM/BKIW. Through a complex bit of international business intrigue,⁵ they approached Vickers, who had a lot of military arms experience. Vickers accepted the order and invested considerable money in production machinery. They produced around 6,000 guns, all new models with grip safety in 9 m/m.

SIMSON & CO., SUHL, GERMANY 1924-1934

Since DWM was off limits and the Erfurt factory had been closed, the German government awarded an exclusive contract to produce P 08s for the army to this firm which at the time made sporting arms, typewriters, and bicycles, among other things. The Luger production tooling from Erfurt became their property. Simson produced about 13,500 P 08s between 1925 and 1934, when their contract expired and the company was expropriated by the Nazis. The Simson family was Jewish.



The Mauser factory in Oberndorf, a/N, before WWII.

MAUSER WERKE AG, OBERNDORF A/N, GERMANY 1930-1945

In 1930, the holding company that had controlling shares in both DWM/BKIW and Mauser decided to move all pistol production from Berlin to the venerable Mauser Works in Oberndorf. Production machinery, raw mate-

rials, completed guns, parts, and people were transferred. Mauser produced a few commercial and contract pieces in the early '30s, but serious production began with the first army contract for the P 08 in 1934 and continued through 1942, when all military Luger production ceased in favor of the P 38. Commercial and some guns for the police were made through 1945, and a few were assembled under French occupation as well. Mauser made several variations of the Luger for commercial and contract sales, but only the P 08 for the German military. Production estimates vary, but all figure slightly over 1 million all told.

HEINRICH KRIEGHOFF ARMS FACTORY, SUHL, GERMANY, 1935-1945

In 1935, Krieghoff was awarded a contract to produce 10,000 P 08s for the Luftwaffe (air force), despite the fact that Mauser was now running at full production for the army (see above). Krieghoff obtained some production machinery (originally from Erfurt) from the nearby Simson facility. It appears Krieghoff bid low on the Luger contract to gain favor with air force procurement in hope of selling them aircraft machine guns. This hope was realized. After the initial contract was fulfilled in 1938, Krieghoff supplied an additional 2200 P 08's to the air force from 1940-1945, and made about 1600 commercial pieces.

VEB ERNST THALMANN, SUHL, GERMAN DEMOCRATIC REPUBLIC (EAST GERMANY), 1953

This state operated facility reworked about 10,000 surplus Luger in the 1950's for police and army use, but in 1953 a "special production" section made a few new guns from scratch, presumably as a feasibility study. Serial numbers went from N1000-N1100 (with a few stragglers), the N denoting new production. There is some evidence that former Krieghoff employees/machinery may have been involved.⁶



S/N 55 of the East German New Production Series; like one or two others, it lacks the N before the number.



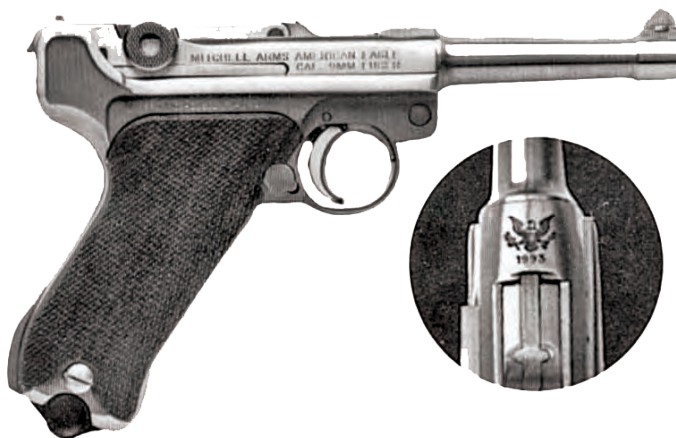
An example of the pistols prepared for Interterms; note Parabellum and not Luger.



The rebuilt Mauser Factory in the 1960's.

**MAUSER WERKE GMBH, OBERNDORF A/N,
GERMANY, 1969-1985**

In the late 1960's, Sam Cummings of the U.S. firm Interarms approached a reorganized Mauser Works and the Swiss Federal Arms factory for proposals to make new Lugers primarily for the American market. Mauser's was accepted, and around 21,000 guns were made. Interarms marketed them as the Parabellum (see below), and they were produced in several variations in both .30 Luger (7.65 m/m) and 9 m/m. Unfortunately, some poor judgement calls on the initial configuration and, worse, rising production costs limited success and Interarms cancelled their contract in 1975. A few were sold in Europe and elsewhere, and the factory produced commemoratives through 1985.



The Mitchell Arms version of the stainless steel "Pistol Parabellum P-08," not called a Luger because of Stoeger's copyright.

**ARMAS INTERNATIONAL MANUFACTURING
COMPANY (AIMCO), HOUSTON, TX 1991-2001**

Entrepreneur Don Mitchell approached the Texas firm with a proposal to make Lugers with modern materials and technology—stainless steel and investment casting. The result was the "Pistol Parabellum P 08." Early quality control problems were finally overcome, and Stoeger Industries picked up the marketing rights from Mitchell in 1993. Note that Stoeger, copyright still intact, sold the last production as Lugers, not Parabellum P 08s. Fewer than 10,000 were made.



The Mitchell Arms version of the stainless steel "Pistol Parabellum P-08," not called a Luger because of Stoeger's copyright.

H. KRIEGHOFF, ULM, GERMANY AS KRIEGHOFF INTERNATIONAL INC, OTTSVILLE, PA PRESENT TIME

Now devoted to manufacture of sporting arms, Krieghoff is nonetheless offering a beautifully made P 08 style Luger in 9 m/m—which of course they call Parabellum—exactly like commercial guns made before World War 2. Only 200 will be made, and the gun comes complete with a bizarre machined aluminum case and accessories and is available through Simpson, Ltd of Galesburg, Il, for only \$18,500.

Two excellent custom gun makers should be noted here; Mike Krause and the late John Martz, both from California. While not really factories, both men made superb weapons, in Krause's case literally from scratch. Around 300 guns were made between them.

This closes the latest chapter in the Luger story. Considering the pistol's timeless appeal, it may not be the last.



The Krause .45 caliber Luger



An early .45 Luger by John Martz

NOTES

1. See Sturgess and Gortz, op. cit., pp 34-36 for biographical details of Borchardt.
2. See Walter, op. cit, pp 41-45 for a discussion of the C 93.
3. See Sturgess and Gortz, op. cit., pp 37-51 to follow Luger's activities.
4. See Bobba, op. cit., pp 42-52 for an account of the Swiss tests.
5. See Sturgess and Gortz, op. cit., pp 824-826 for a discussion of Vicker's Luger involvement
6. See Baudino and Van Vlimmeren, op. cit, for a discussion of DDR Lugers

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APPENDIX

Summary of Manufacturers,	Dates	and Production
DWM/BKIW, Berlin, Germany,	1900-..1930	1,331,000
Royal (Prussian) Arms Factory, Erfurt, Germany,	1911-..1918	520,000
Royal Arms Factory, Spandau, Germany (parts assembly only)	1918	200
Federal Arms Factory, Bern, Switzerland,	1919-1946	48,000
Vickers, Ltd, Craypool, England,	1921	6,250
Simson & Co., Suhl, Germany,	1923-1934	13,500
Heinrich Krieghoff Arms Factory, Suhl, Germany,	1935-1945	13,850
Mausser Werke, Oberndorf a/N, Germany,	1930-1945	1,014,000
VEB Ernst Thalmann, Suhl, Germany,	1953	100
Mausser Werke GmbH, Oberndorf a/N, Germany,	1969-1985	21,000
AIMCO, Houston, Texas (stainless steel only)	1992-2001	<u>10,000</u>
	Approximate Total	2,977,900



