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# **LOCKS SAFES AND SECURITY**

**The hardcover book, Locks Safes and Security by Marc Weber Tobias 2<sup>nd</sup> edition, was published in 2002. This work was followed by an electronic version called LSS+ CD a few years latter.**

The LSS+ CD contains a lot more content than the book. Content has been updated as of 2004. It is released with 3 separate security levels, Public, Locksmith, and Government.

This document is a pdf version of the material extracted from LSS+. It contains material at Public, Locksmith and Government Levels

Locksmith vs Government Level Material:

Book 1 Chapters 1 thru 23 are identical

Book 2 Chapter 24 thru 30 are identical

Book 2 Chapter 31 is different (Decoding)

Book 2 Chapter 32 is identical

Book 3 Chapters 33 thru 36 are identical

Book 4 Chapters 37 thru 39 are identical

Book 4 Chapter 40 is different (Alarms)

# LSS+

## Electronic Infobase Edition of Locks, Safes,

## and Security

### Version 5.0-04185

This infobase includes the revised editions of **The Art of Manipulation**; (1) **A Treatise on Fire & Thief-Proof Depositories and Locks and Keys** (2), originally published in London, in 1850; and **Locks and Safes: The Construction of Locks** (3), by A.C.Hobs. **Locks, Safes, and Security** (4) was first published in 1970 by Charles C. Thomas Publishers, Springfield, Illinois. The Second Edition was released in 2000. Supplementary materials can be found at the website [www.security.org](http://www.security.org). (5)

**Created by Marc Weber Tobias, B.S., J.D.**

Member: ABA, ASIS, AFTE, IAI, ALOA, SAVTA, APA, AAFS, IAIL

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Electronic Infobase Version 5.0, based upon the Second Edition, published by Charles C. Thomas, Springfield Illinois, 2000. The original edition was published in 1970 and is no longer available.

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





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*Figure 16-26 Diagram of depth and spacing*

*Figure 16-27 Best removable core assembly*

*Figure 16-28 Best removable core lock*

*Figure 16-29 Conventional master keying*

*Figure 16-30 Profile lock manufacturing process at Ikon*

*Figure 16-31 Manufacturing process for brass plug at Ikon*

*Figure LSS+1601 Pin stack*

*Figure LSS+1602 Broach is used to create a keyway*

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*Figure LSS+1603 Top pins and drivers*

*Figure LSS+1604 The shear line*

*Figure LSS+1605 Calculating pin tumbler lock differs*

*Figure LSS+1606 Re-pinning a lock*

*Figure LSS+1607 Re-pinning process with all pins loaded*

*Figure LSS+1608 Formation of a plug at Ikon factory*

*Figure LSS+1609 The broaching process*

*Figure LSS+1610 How a plug is broached*

*Figure LSS+1611 A plug that has been partially and fully broached*

*Figure LSS+1612 An Ikon profile created by a broach*

*Figure LSS+1613 The driver and lower pins in their three states.*

*Figure LSS+1614 Sectional view of the location and function of the mushroom tumblers.*

*Figure LSS+1615 The status of driver and bottom pins in the locked and plug rotating unlocked position.*

*Figure LSS+1615 The status of driver and bottom pins in the locked and plug rotating unlocked position.*



The use of a pin tray or setup tray is required for forensic disassembly of a lock. Courtesy of Hans Mejlshede.



Producing pins for cylinders. Courtesy of Hans Mejlshede.



Forensic issues regarding the bypass of security and mushroom tumblers. Courtesy of Hans Mejlshede.



Decoding the Best removable core lock for the control key, courtesy of Harry Sher.



LSS101: Ikon factory, Berlin, Germany: How locks are made.



LSS204: Brian Chan on positive and negative locking.



LSS204: Brian Chan discussing balanced drivers

## Chapter 17 Traditional Mechanical Locking Systems

*Figure 17-1 S&G 4440 dual control lever lock*

*Figure 17-2 Tann high-security lever lock*

*Figure 17-3 High-security lever tumbler locks*

*Figure 17-4a Western electric wafer lock*

*Figure 17-4b Western electric floating lever tumbler lock*

*Figure 17-5 Lever lock for prisons*

*Figure 17-6 Chubb Ava wafer lock*

*Figure 17-7 Evva 3KS laser track system*

*Figure 17-8 Laser track system in Mercedes*

*Figure 17-9a Abloy Disklock*

*Figure 17-9b Abloy Disklock Pro series*

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- Figure 17-12 Corbin-Emhart high-security interlocking pin tumbler system
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- Figure 17-19 Evva DPX
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- Figure 17-20b Rotating tumbler for the cam lock
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- Figure 17-21a Medeco cam lock
- Figure 17-21b Details of the Medeco cam lock
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- Figure 17-24a Schlage Primus
- Figure 17-24b Finger pins within the Primus
- Figure 17-25a Assa sidebar cylinder
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- Figure LSS+1702 The Evva 3KS is a modular system. Shown is one cylinder in a locked position.
- Figure LSS+1703 A BiLock key is distinctive in its dual bitting configuration.
- Figure LSS+1704 Medeco Bilevel key and internal sidebar design.
- Figure LSS+1705 The IKON WSW Lock system
- Figure LSS+1706 Medeco M3 locking system, showing action of the slider
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- Figure LSS+1708 Medeco M3 system, showing the integration of the sidebar with slider
- Figure LSS+1709 Schlage Primus keys and side bit milling
- Figure LSS+1710 Schlage Primus sidebar and gate interaction
- Figure LSS+1711 Orientation of finger pins within the Schlage Primus



Abloy master keying theory, Courtesy of Hans Mejlshede.



Forced entry of Abloy locks, and forensic indications, Courtesy of Hans Mejlshede.



The Peter Field (Medeco) patent for a security tumbler. Courtesy of Hans Mejlshede.



Forensic analysis of the Medeco cam lock. Courtesy of Hans Mejlshede.

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*Figure LSS+2301 The English thumbscrews developed in the seventeenth century*

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*Figure LSS+2303 Examples of Persian padlocks 17-18th century, and 1966 model of the same lock.*

*Figure LSS+2304 An early Chinese padlock.*

*Figure LSS+2305 Example of seventeenth century Spanish padlock and key.*

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*Figure LSS+2308 Flemish padlock, sixteenth century*

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*Figure LSS+2318 Padlock diagram of simple locking dog*

*Figure LSS+2319 German Abus padlock, 1970*

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Figure LSS+2320 Chubb Hercules padlock, 1971

Figure LSS+2321 Chubb Conquest padlock

Figure LSS+2322 Diagram of the ratchet locking mechanism of the Club.

Figure LSS+2323. A modified Club that has been converted into a shotgun.

Figure LSS+2324. The Silca RW2 Transponder decoder and copier.

Figure LSS+2325 Railroad mail clerk badge and antique mail locks

Figure LSS+2326 Post office locks, including the famous Andrus lock that was patented in 1914

Figure LSS+2327 Arrow eight lever post office box lock, and lever tumbler

Figure LSS+2328 Rotary registered mail lock produced by the U.S. Postal Service



Discussion of transponder theft. Courtesy of Hans Mejlshede.



Bypass of push button locks. Courtesy of Don Shiles.



Discussion of Simplex push button lock, by Harry Sher



Use of tryout keys, courtesy of Harry Sher.



LSS202: Ross Anderson on smart card technology

## Chapter 24 Investigation and Evidence Involving Locks and Keys

### No Exhibits



A forensic investigation involving the theft of a BMW automobile. Courtesy Hans Mejlshede.



Doing research on different bypass techniques is important for the forensic investigator. Courtesy of Don Shiles.



Analysis of a case involving forensics. Courtesy of Don Shiles.



Case example, burglary investigation. Courtesy of Don Shiles



Case example of hotel lock bypass. Courtesy of Don Shiles.



Case example, Courtesy of Hans Mejlshede.



Analysis of a case involving forensic locksmithing. Courtesy of Don Shiles.



Mail slot bypass device. Courtesy of Hans Mejlshede.



Keys can be copied by taking a 1:1 image using a copier machine.

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Courtesy of Hans Mejlshede.



Master key records. Courtesy of Hans Mejlshede.



Investigative clues that develop during a case. Courtesy Jim Bickers.



Pickability or ease with which a lock can be picked. Courtesy of Hans Mejlshede.

## Chapter 25 Forensic Examination: Specifications, Operations, and Security

*Figure 25-1 Partially picked axial pin tumbler lock*

Figure LSS+2501 Forensic investigation forms

Figure LSS+2502 Forensic evidence log-in report by Hans Mejlshede

Figure LSS+2503 Sample forensic analysis form by Hans Mejlshede



Art Paholke is the father of modern forensic locksmithing. Courtesy of Hans Mejlshede.



Many car thefts are simulated for insurance claims. Courtesy of Hans Mejlshede.



It is essential to save the pins from a lock that has been the subject of a burglary attack. Courtesy of Hans Mejlshede.



Pressure will often be applied to the forensic locksmith during the course of an investigation to change the results of a report. Courtesy of Hans Mejlshede.



A clean work area for the forensic locksmith is a necessity. Courtesy of Hans Mejlshede.



Care must be exercised in cleaning of components. Courtesy of Hans Mejlshede.



The Forensic locksmith is often called upon to investigate covert entry. Courtesy of Hans Mejlshede.



The forensic investigator must prepare detailed reports. Courtesy of Hans Mejlshede.



Evidence in car theft investigations. Courtesy of Don Shiles.



Analysis of vehicle locks. Courtesy of Hans Mejlshede.



Analysis of vehicle theft cases. Courtesy of Hans Mejlshede.



Simulation of vehicle theft. Comments on investigation. Courtesy of Hans Mejlshede.



Investigations involving vehicle fires. Courtesy of Hans Mejlshede.



Analysis of marks produced by a slimjim bypass tool. Courtesy of Hans Mejlshede.



Use of rubber or silicone-coated tweezers. Courtesy of Hans Mejlshede.



Discussion regarding microscopes for use in forensic analysis. Courtesy of Hans Mejlshede.



Issues regarding crime scene sketches. Courtesy of Don Shiles.



Evidence handling techniques. Courtesy of Don Shiles.



Methods of forensic analysis. Courtesy of Don Shiles.



The investigative locksmith as a witness. Courtesy of Don Shiles.



Required background of the forensic locksmith and investigator. Courtesy of Don Shiles.



Definition of a forensic locksmith.



Use of photograph. Courtesy of Don Shiles



What is an investigative locksmith? Courtesy of Don Shiles.



An introduction and summary of forensic locksmithing. Courtesy of Hans Mejlshede.



Forensic locksmithing history and the role of Art Paholke. Courtesy of Hans Mejlshede.



Was the lock picked? Courtesy of Don Shiles.



Macro lens, Courtesy of Hans Mejlshede.



Data back for documentation of images. Courtesy of Hans Mejlshede.



Photographic equipment requirements. Courtesy of Hans Mejlshede.



Ring strobe is a necessity for forensic photography. Courtesy of Hans Mejlshede.



Use of plastic tweezers. Courtesy of Hans Mejlshede.



Recovering stamped numbers from keys and locks. Courtesy of Hans Mejlshede.



Opinions of examiner, and certainty of their opinions. Courtesy of Hans Mejlshede.



Logging receipt of evidence. Courtesy of Hans Mejlshede.



Issues regarding investigative reports. Courtesy of Hans Mejlshede.



It is difficult to bypass laser track locks through the use of jiggle keys. Courtesy of Hans Mejlshede.



Definition of an Investigative locksmith. Courtesy of Don Shiles.



Forensic marks and their observation with proper lighting. Courtesy of Don Shiles.



The investigative locksmith gets involved in insurance fraud cases. Courtesy of Hans Mejlshede.



Marks on the back of the lock from bypass. Courtesy of Hans Mejlshede.



Use of WD-40 to clean and lubricate. Courtesy of Hans Mejlshede.



Oxidation and dating of marks in a forensic examination. Courtesy of Don Shiles.



Forensic implications of using a shim to open a lock prior to analysis. Courtesy of Hans Mejlshede.



An attempt may be made to mask pick marks so that the perpetrator is not identified. Courtesy of Hans Mejlshede.



Obtaining all keys that fit a particular cylinder. Courtesy of Hans Mejlshede.



Removal of cylinder and its analysis must be done correctly. Courtesy of Hans Mejlshede.



Changing or removal of top pins. Courtesy of Hans Mejlshede.



Preliminary issues in the examination of a lock. Courtesy of Don Shiles.



Examination of a lock and disassembly. Courtesy of Don Shiles.



Examination of a lock and marks that are visible. Courtesy of Don Shiles.



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