Physical Security: An Overview from Deadbolts to Deathtraps

By: Cody L. Hofstetter

Disclaimer

- This presentation is for educational purposes only.
- I am not a lawyer even if I sound like one. Seek legal advice from someone who is.

Overview

- Introduction
- Basic Security
- Breaking/Fixing Basic Security
- RFID
- Closing Points to Remember

About Cody Hofstetter

From Software Pirate to Freedom Advocate

Death of the Dino

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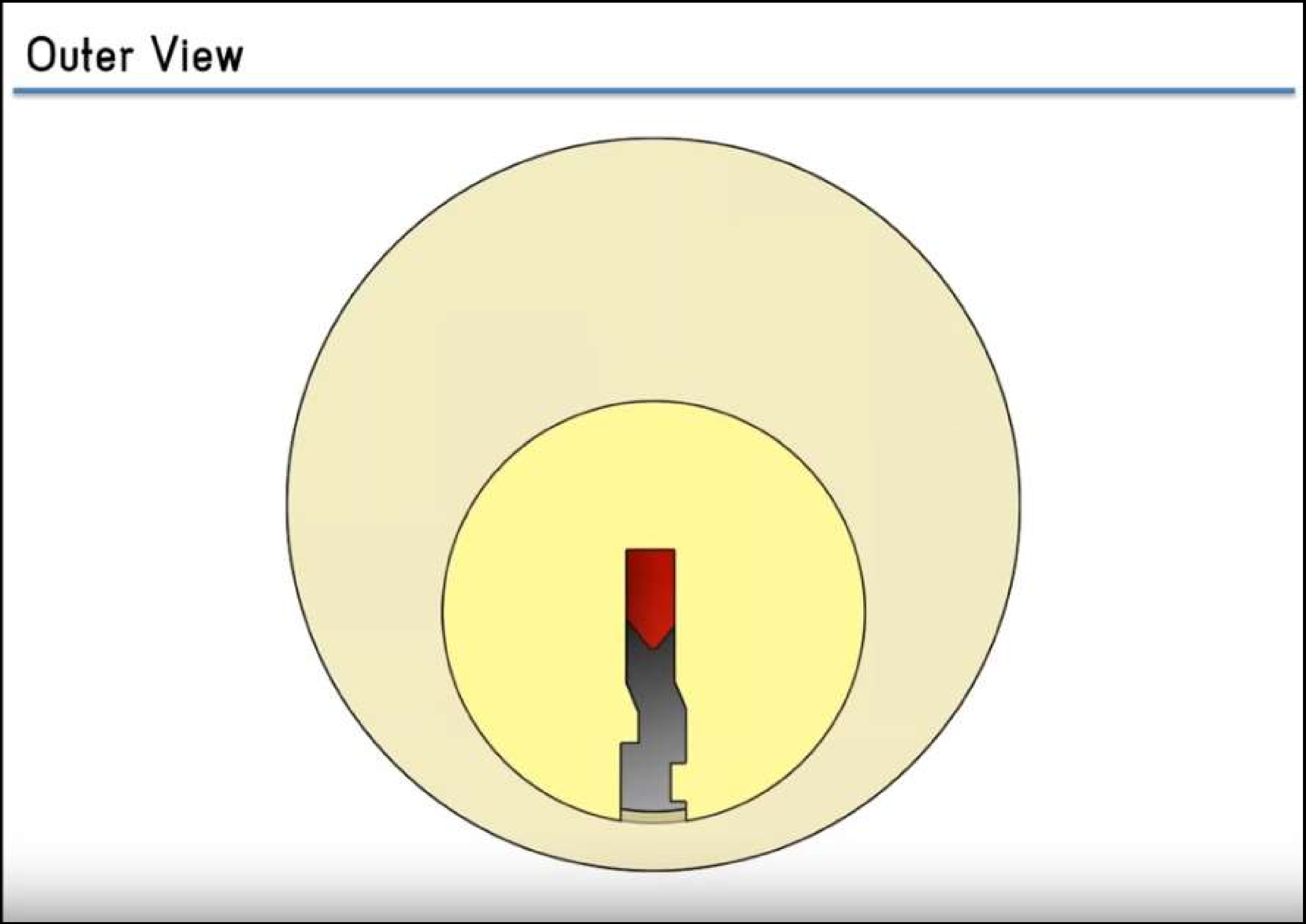
Make Your Adversaries Cry

SOVEREIGN CYBE

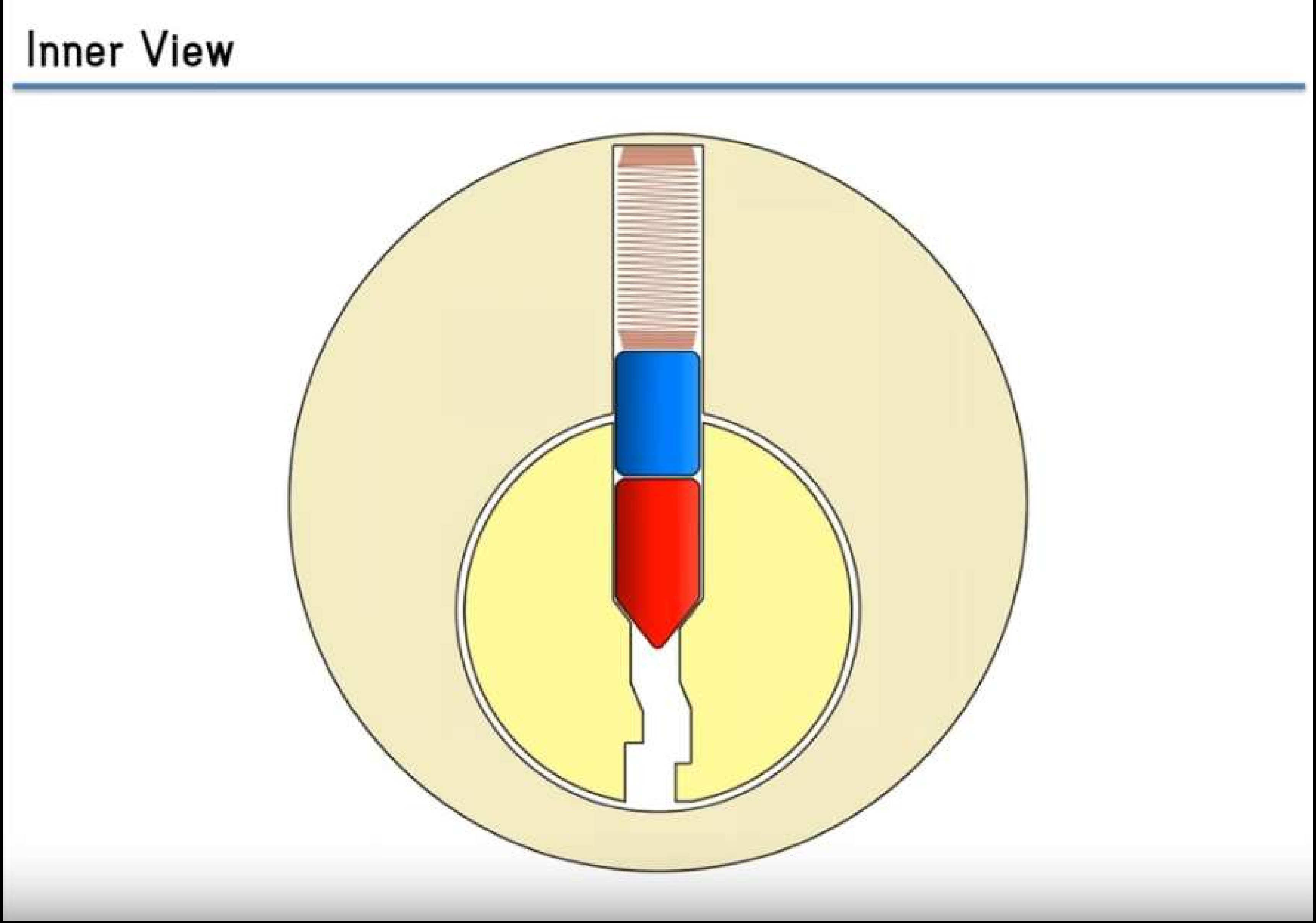
INDUSTRIES

Red Eye Audience Participation

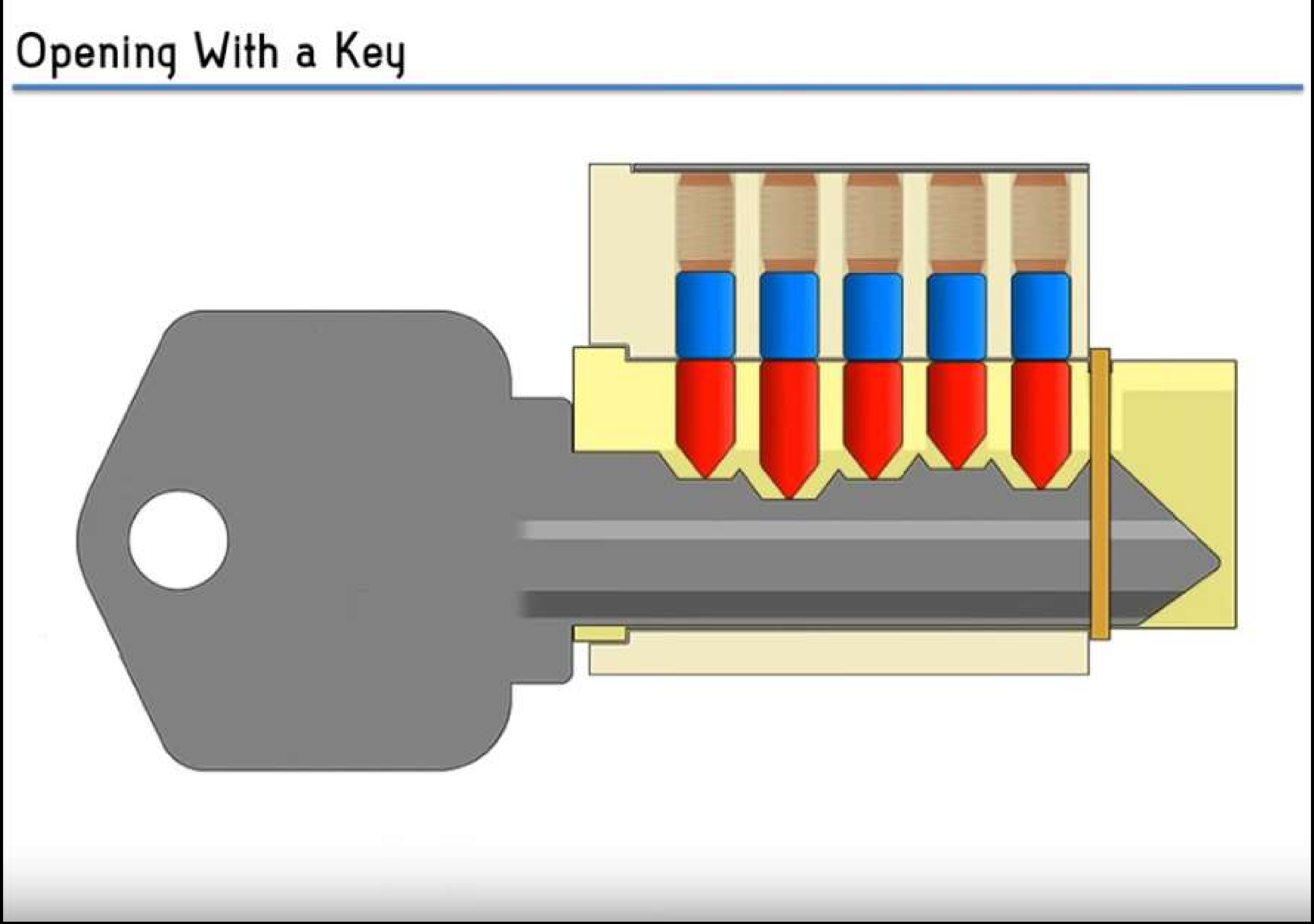
How Basic Locks Work



How Basic Locks Work

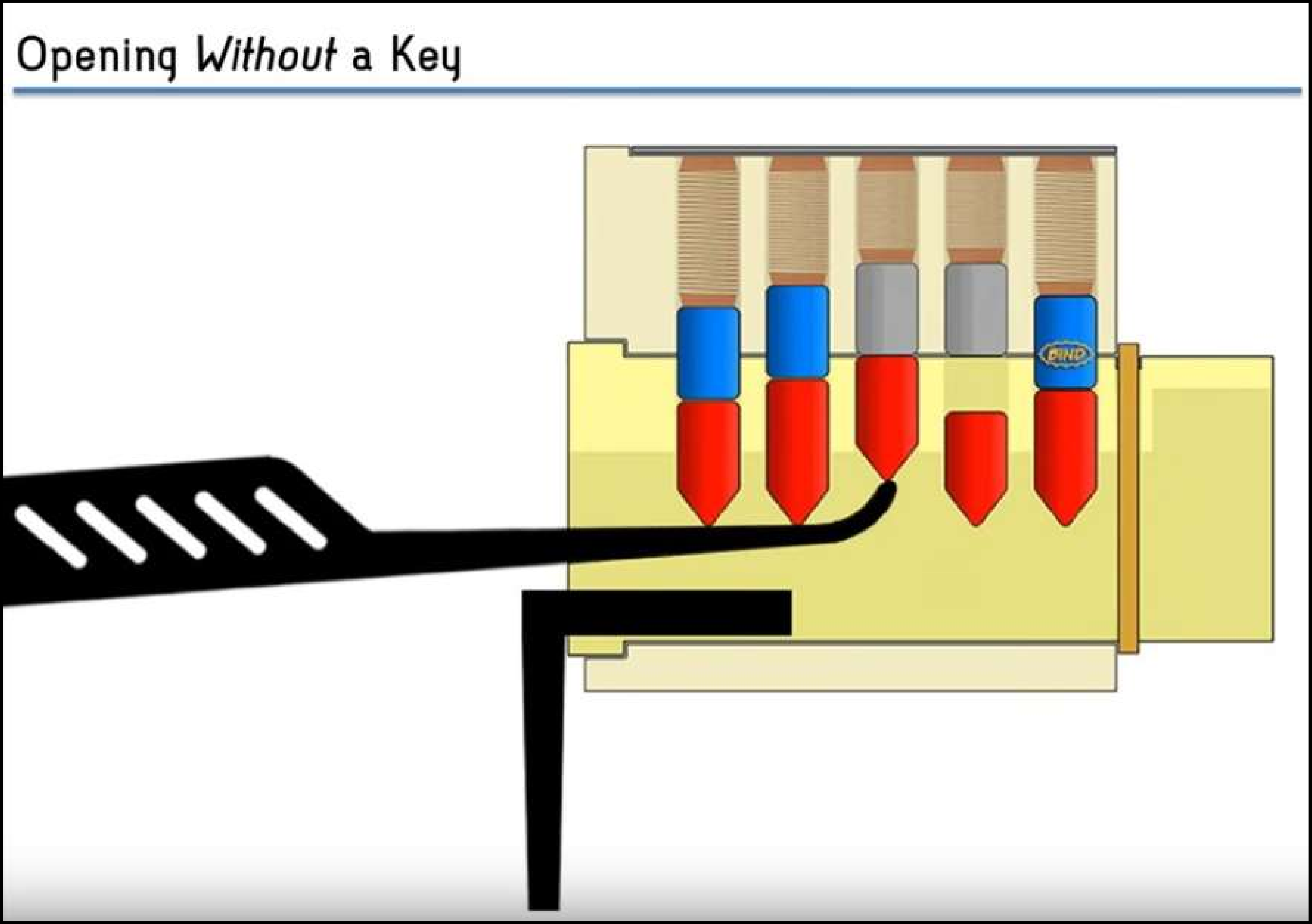


How Basic Locks Work



Opening With a Key

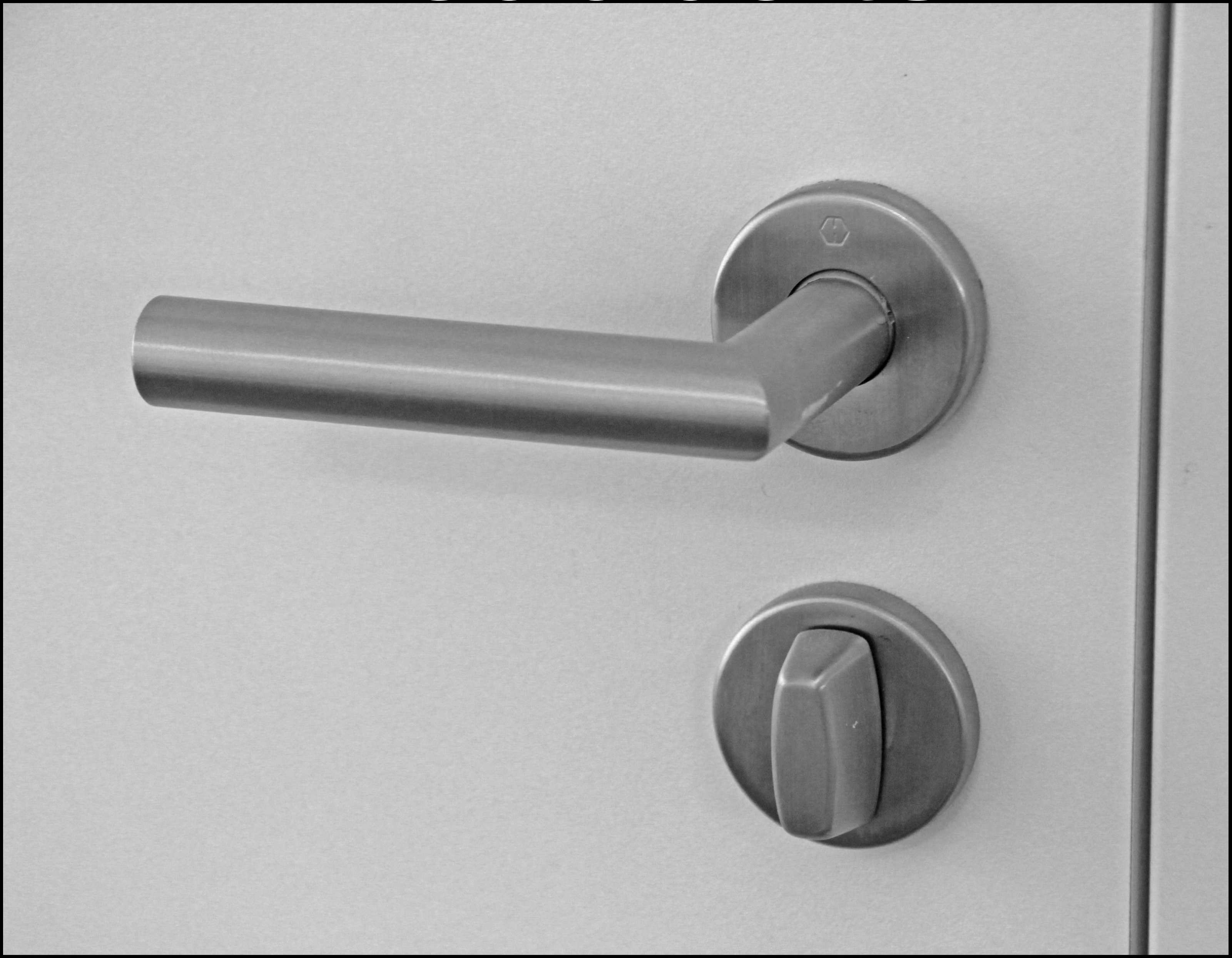
How Basic Locks Work



Opening *Without* a Key

Deadbolts

Deadbolts



Deadbolts

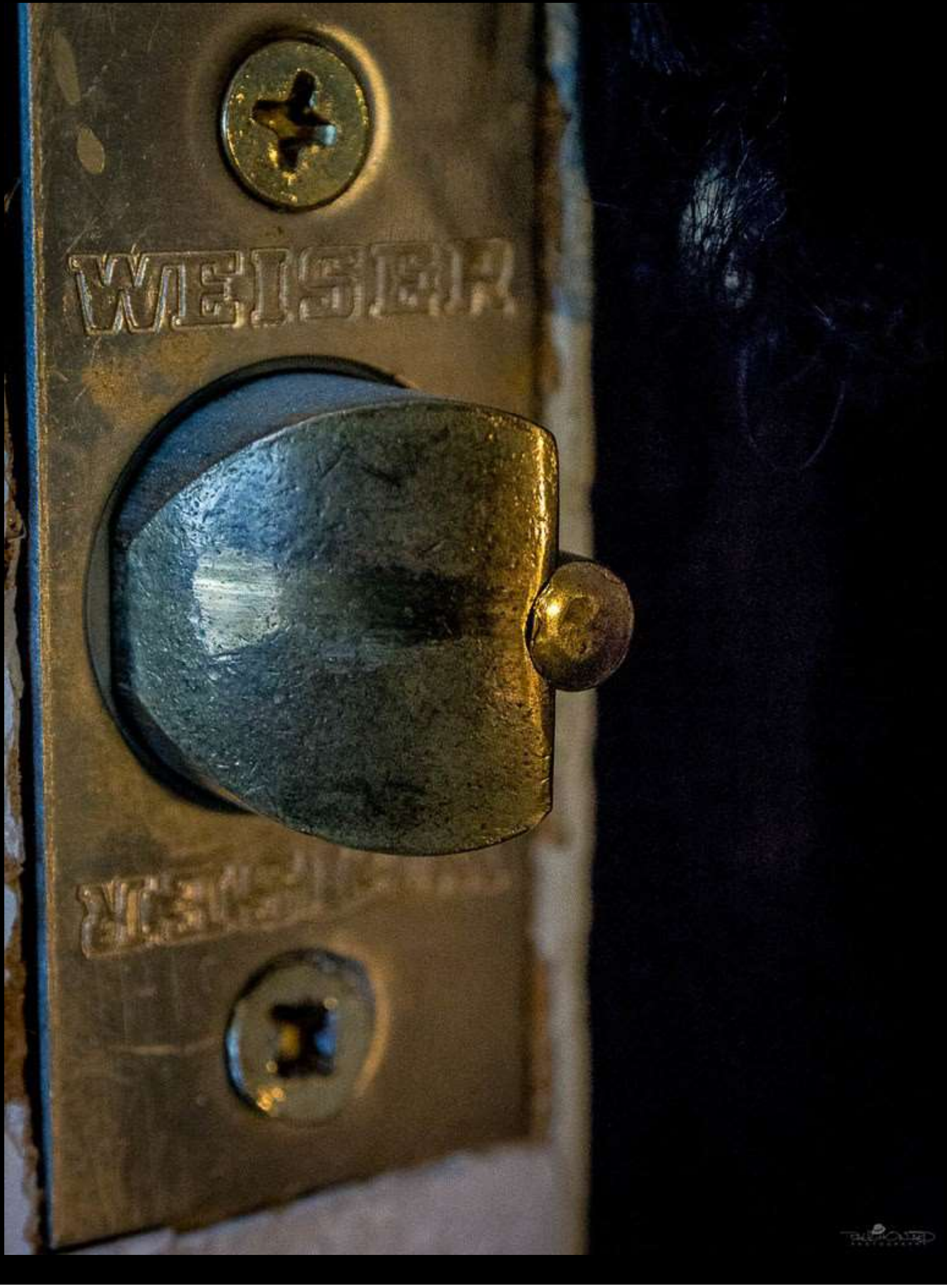
Fail-Safe Vs Fail-Secure

- Fail-Safe (aka Fail-Open)
  - A device will not endanger lives or property when it fails
- Fail-Secure (aka Fail-Closed)
  - Access or data will not enter an adversary’s hands in a failure

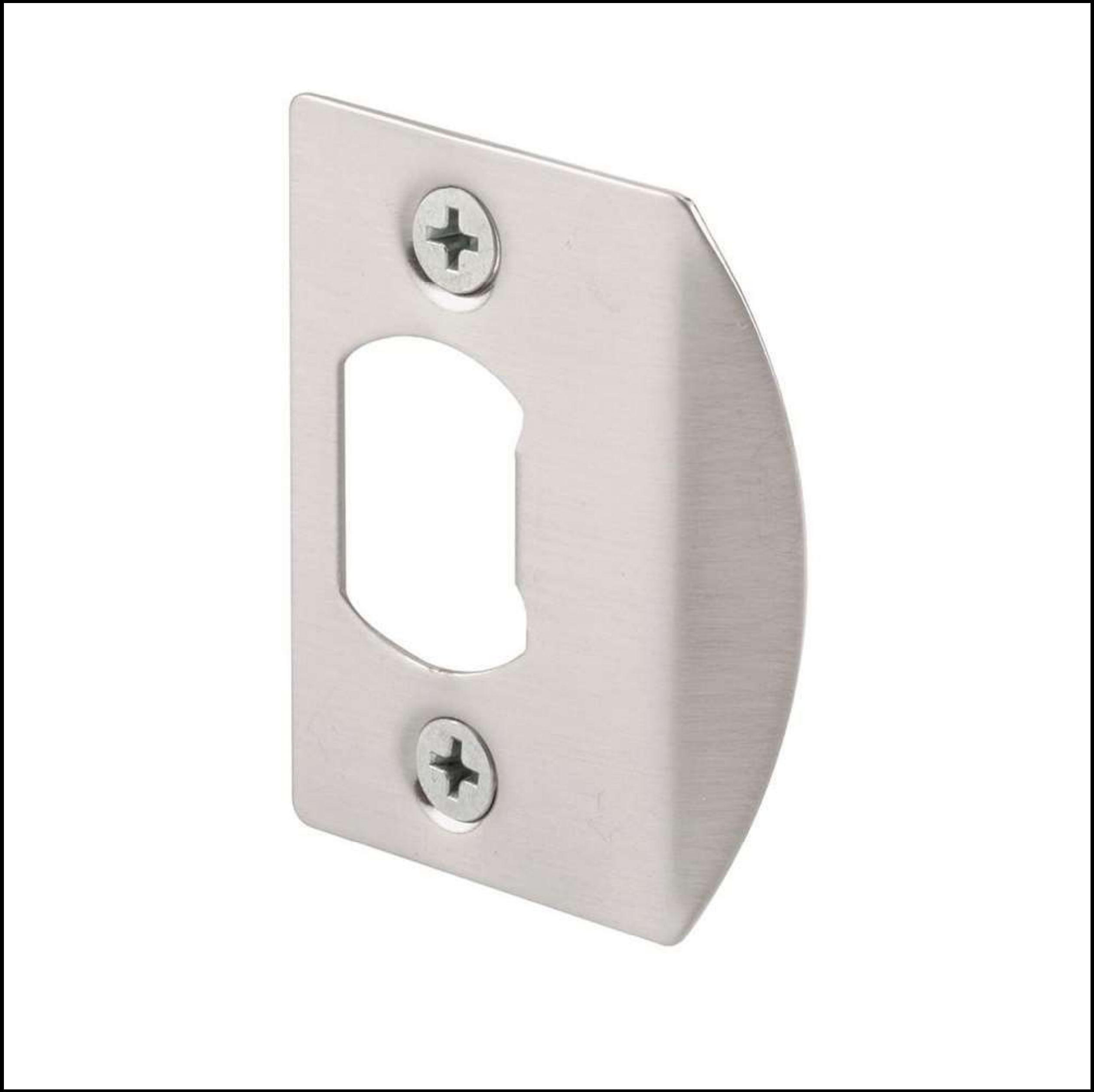
Fail-Safe Vs Fail-Secure

- E.g. a building catches fire
  - Fail-Safe systems unlock doors to allow firefighters and quick escape
  - Fail-Secure systems lock doors to prevent unauthorized access

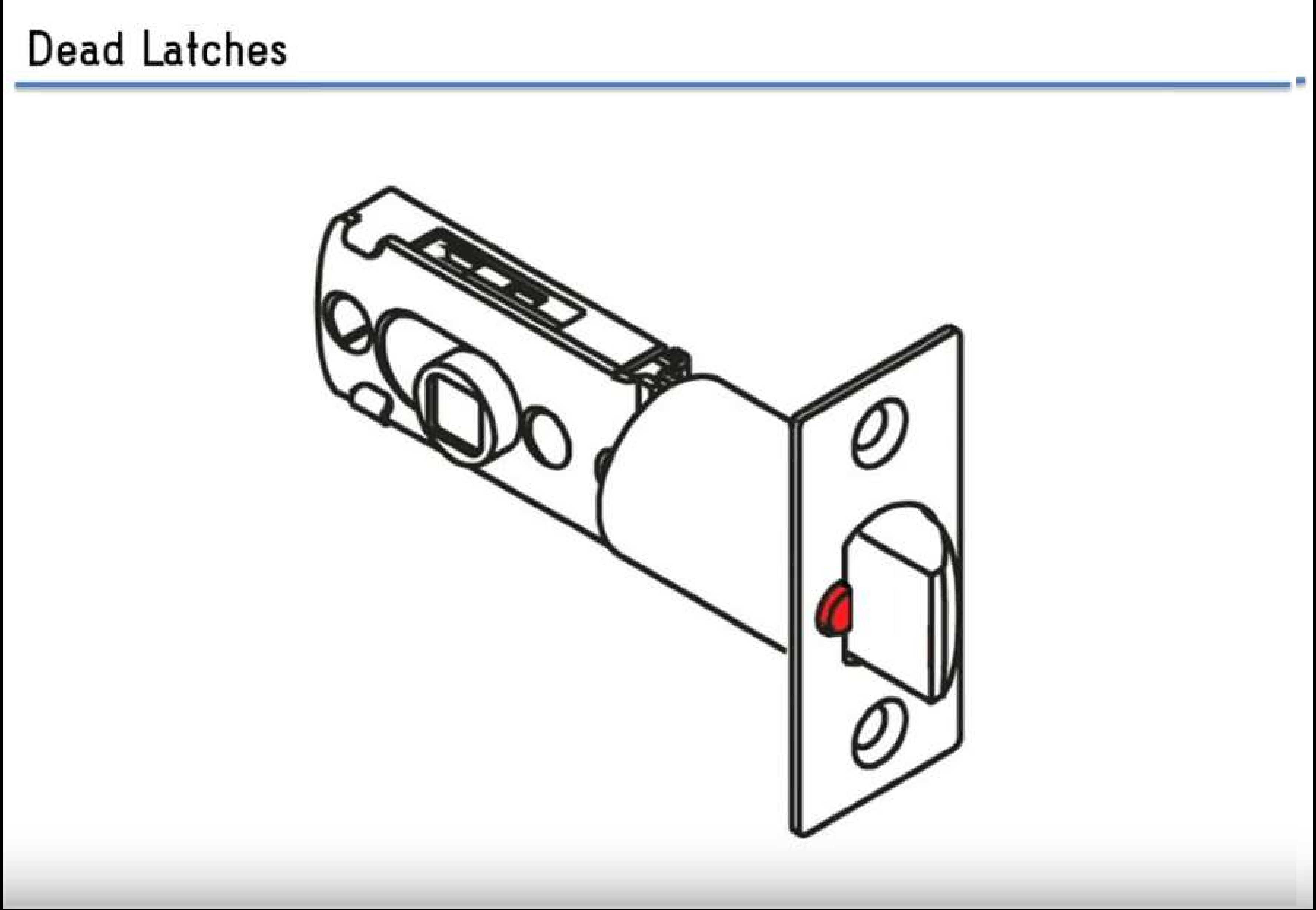
Dead Latch



Strike Plate



Dead Latch Engaging



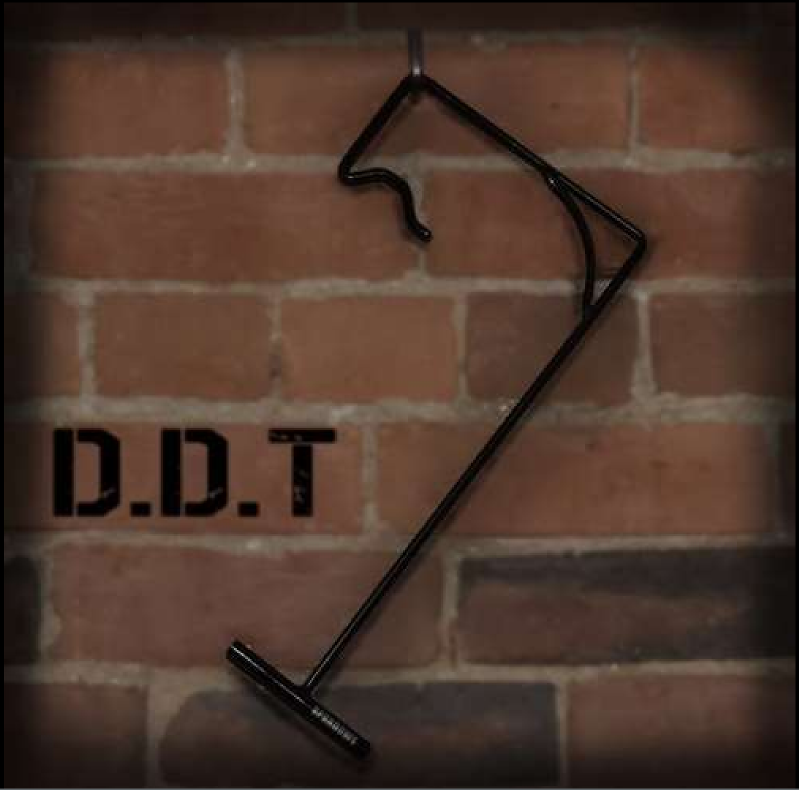
Dead Latches

Lockpicking

- Not at all how it happens in the movies
- NOT illegal to own tools or practice
- A single lock can take anywhere from seconds to hours depending upon its complexity (visit TOOOL)
- Any real engagement will likely involve the use of bypass tools

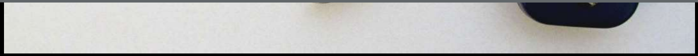
Lockpicking

- Bypass tools:
  - Bump keys
  - Snap gun
  - Crash bar
  - Mouth



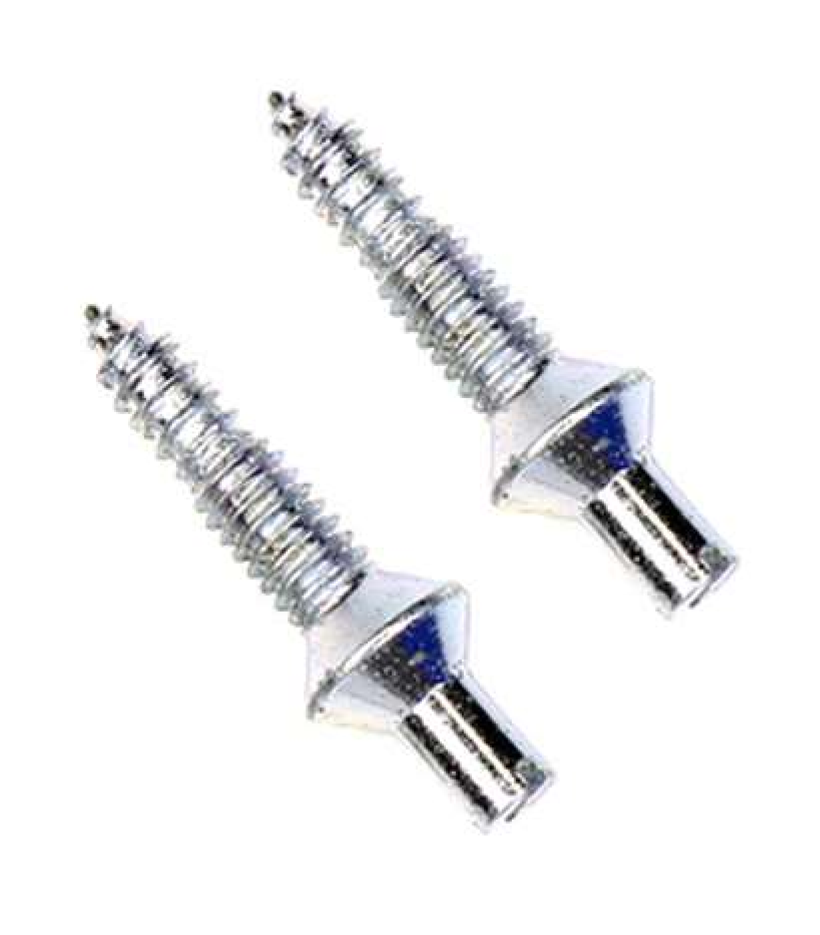
D.D.T

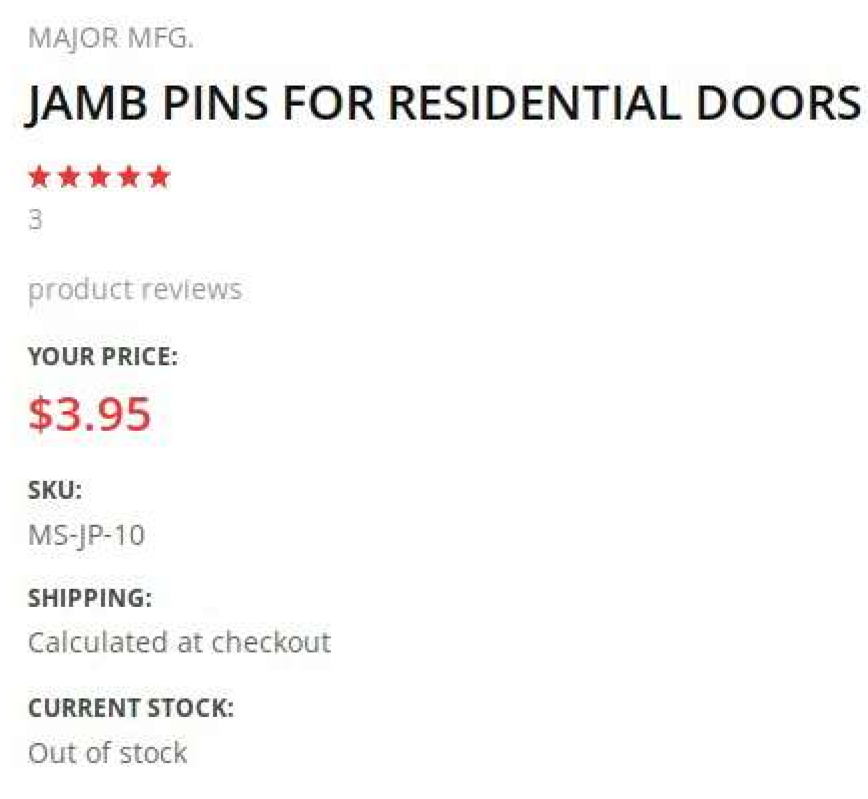
Odd's are if you don't know what this is .... you shouldn't have one



Hinge Removal

Jamb Pins





MAJOR MFG.

JAMB PINS FOR RESIDENTIAL DOORS

★★★★★

3

product reviews

YOUR PRICE:

$3.95

SKU:

MS-JP-10

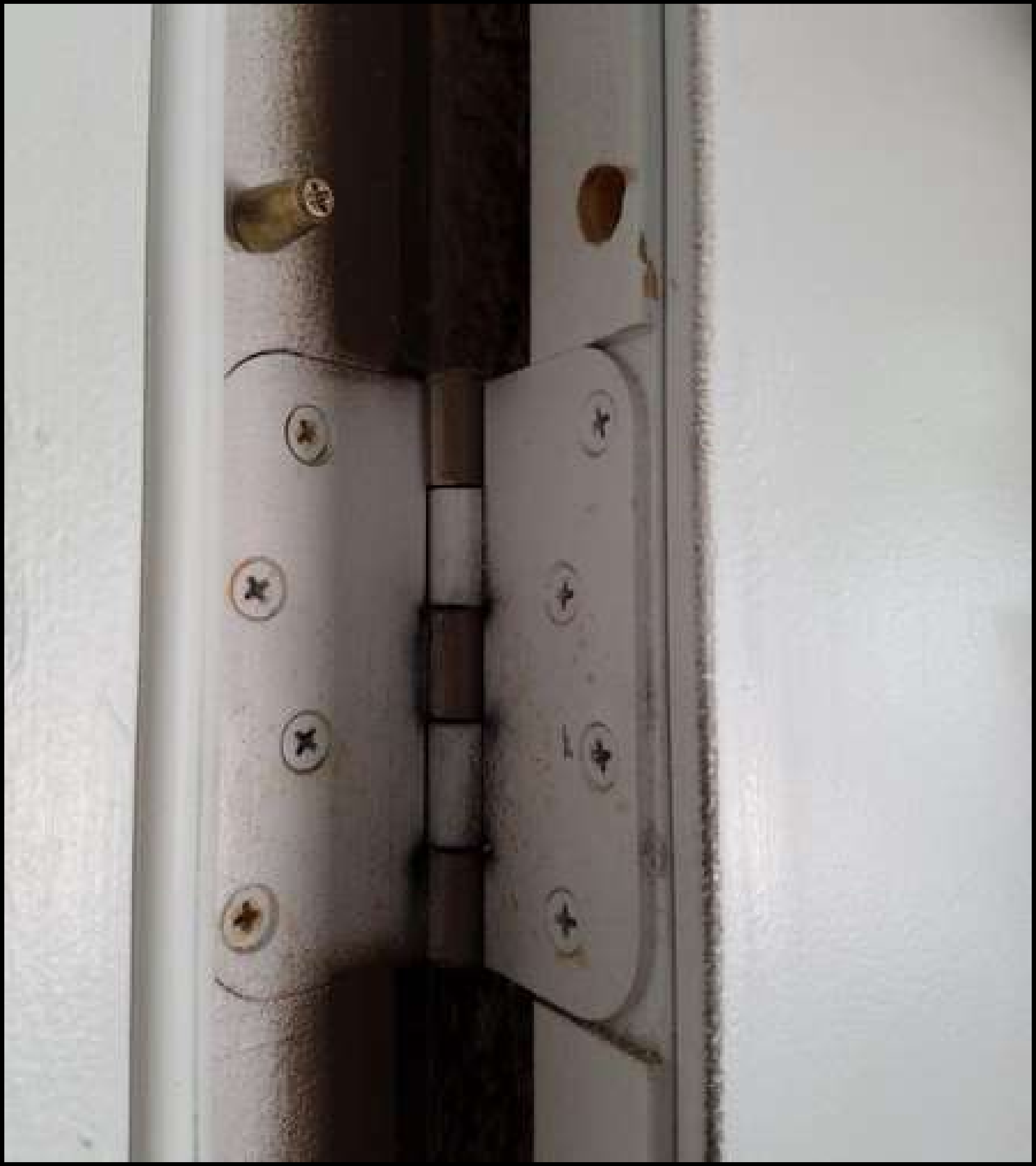
SHIPPING:

Calculated at checkout

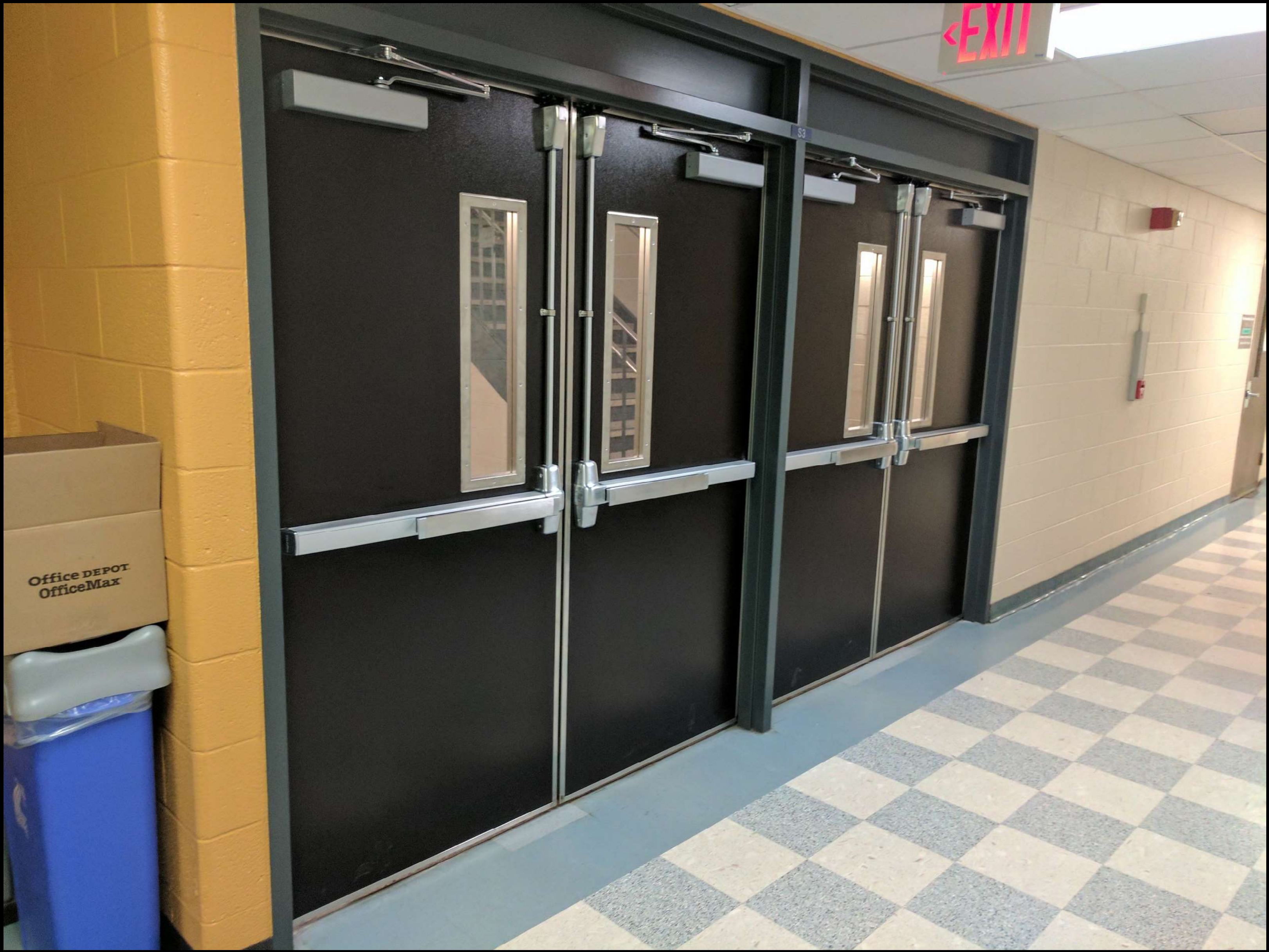
CURRENT STOCK:

Out of stock

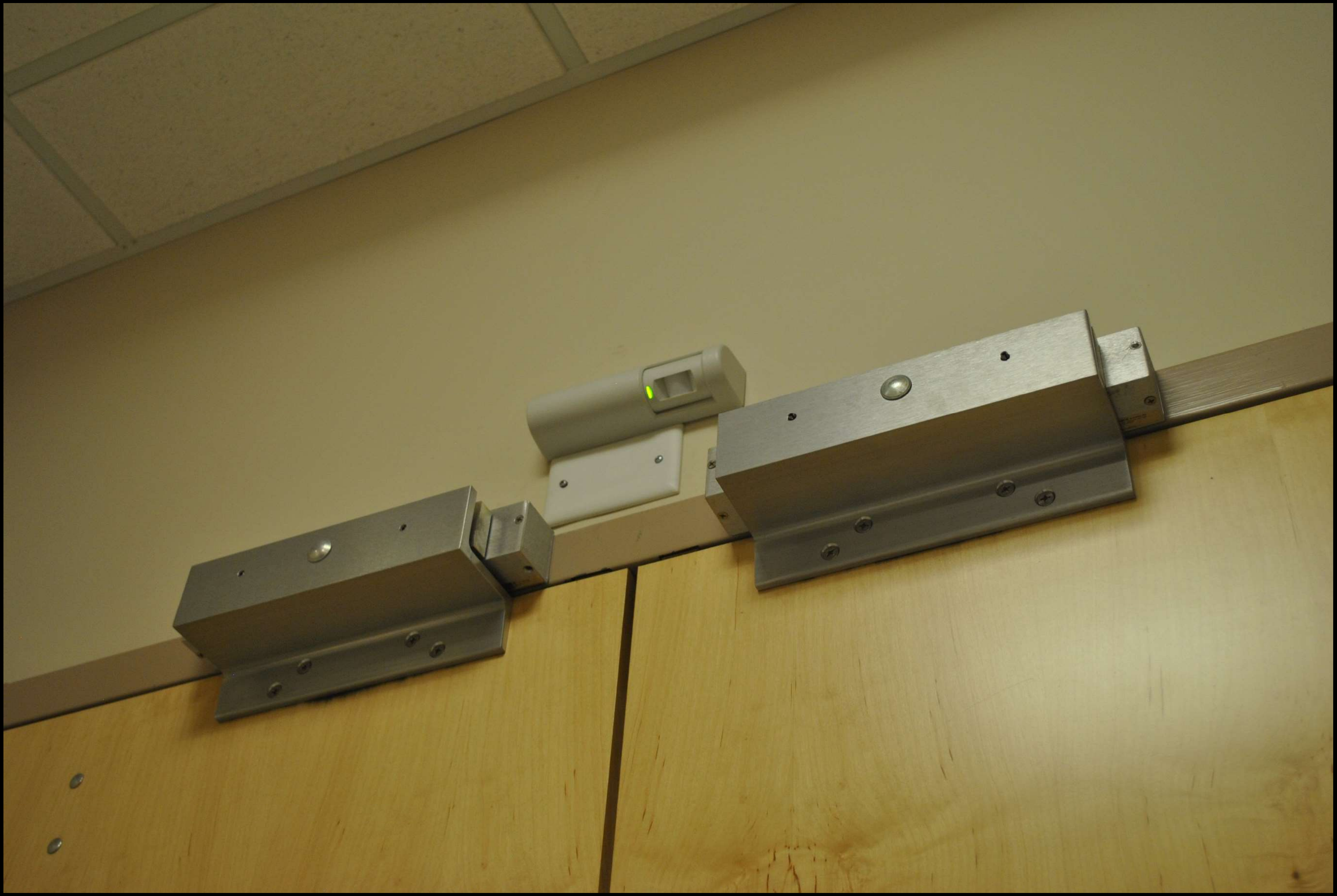
Jamb Pins



Crash Bars



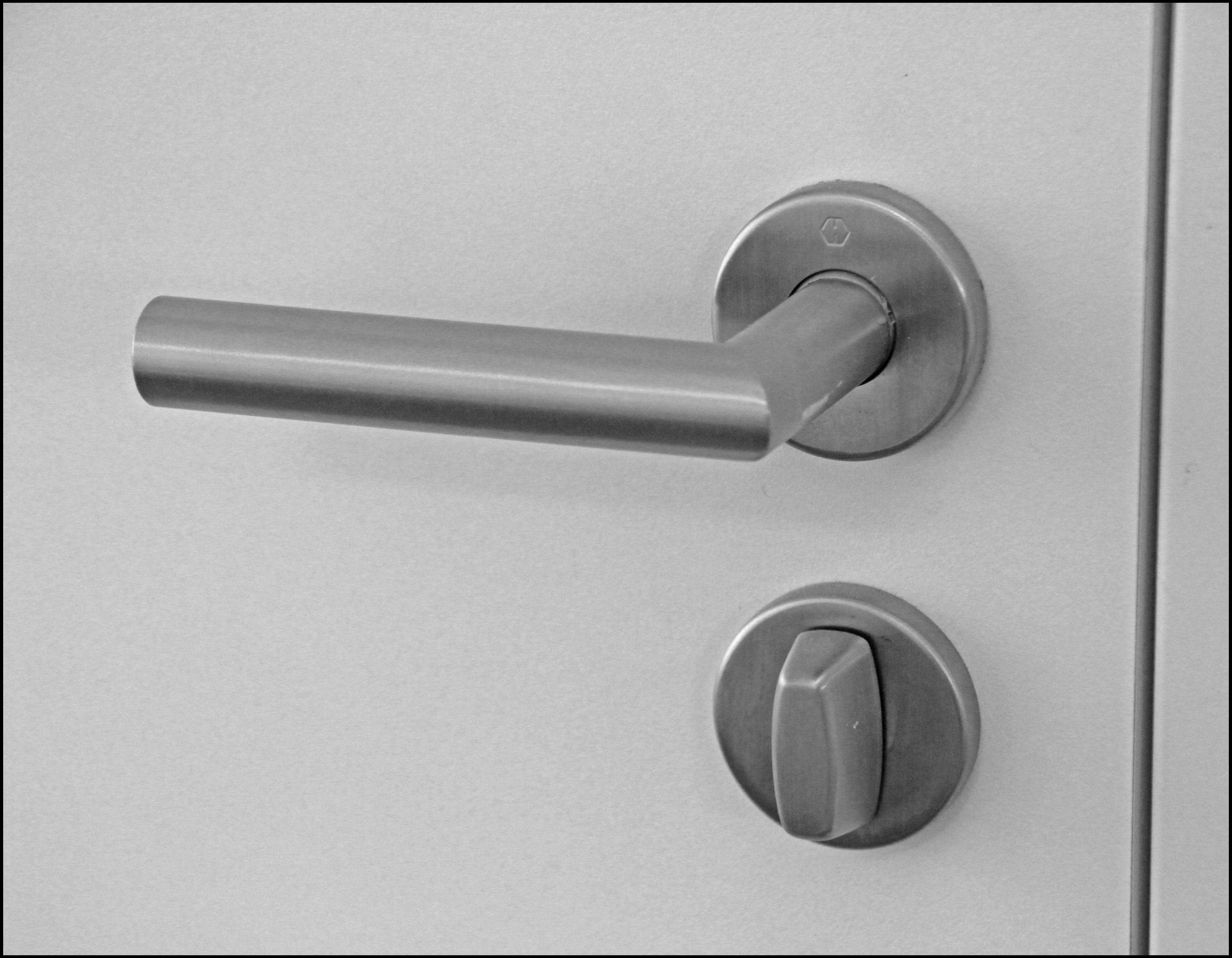
Request to Exit



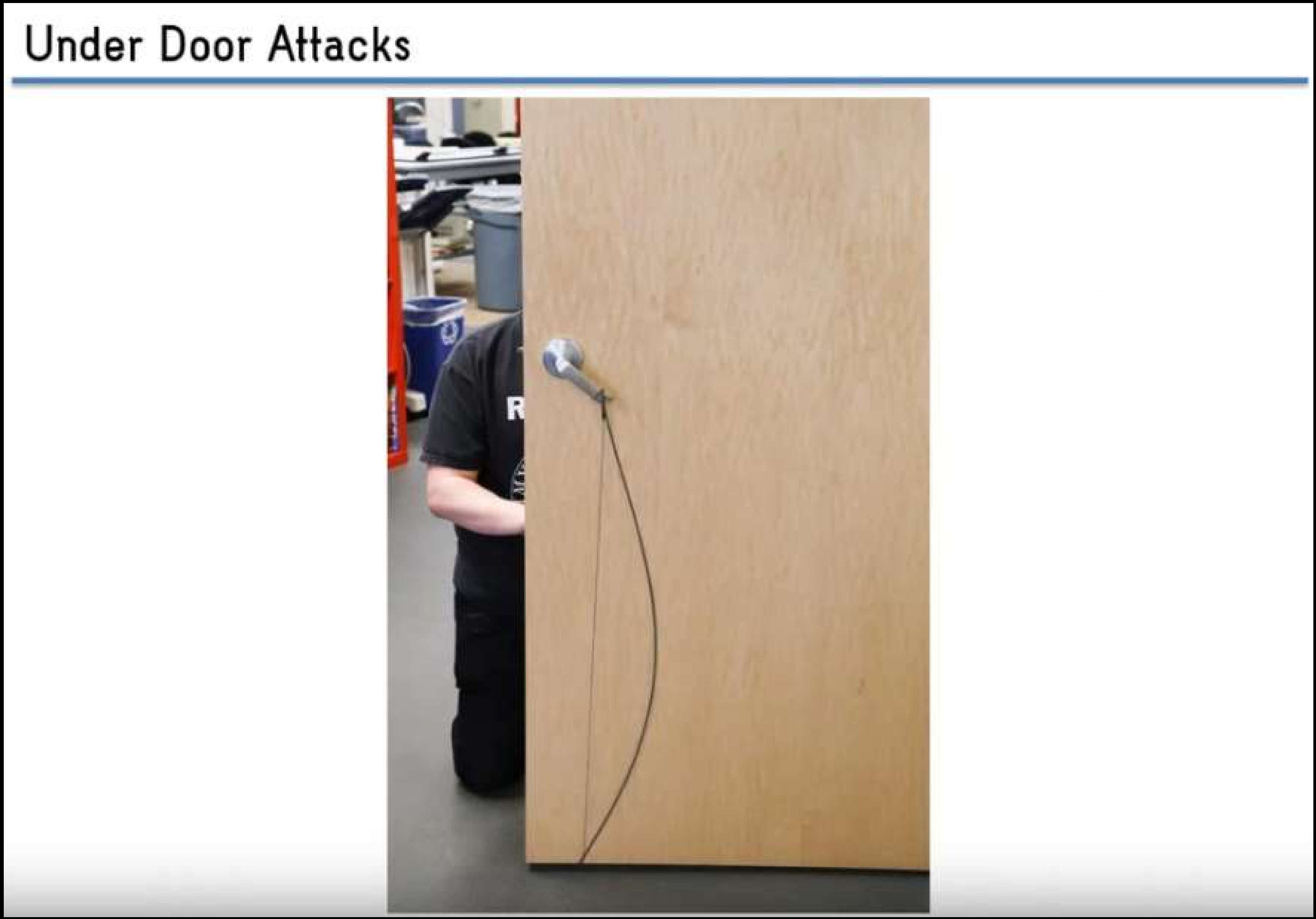
REX Bypass

Maxxtro
SPRAYDUSTER
DRUCKGAS-REINIGER
BOMBE DÉPOUSSIÉRANTE
ARIA COMPRESSA
SPRAY DUSTER

Modern Door Handles

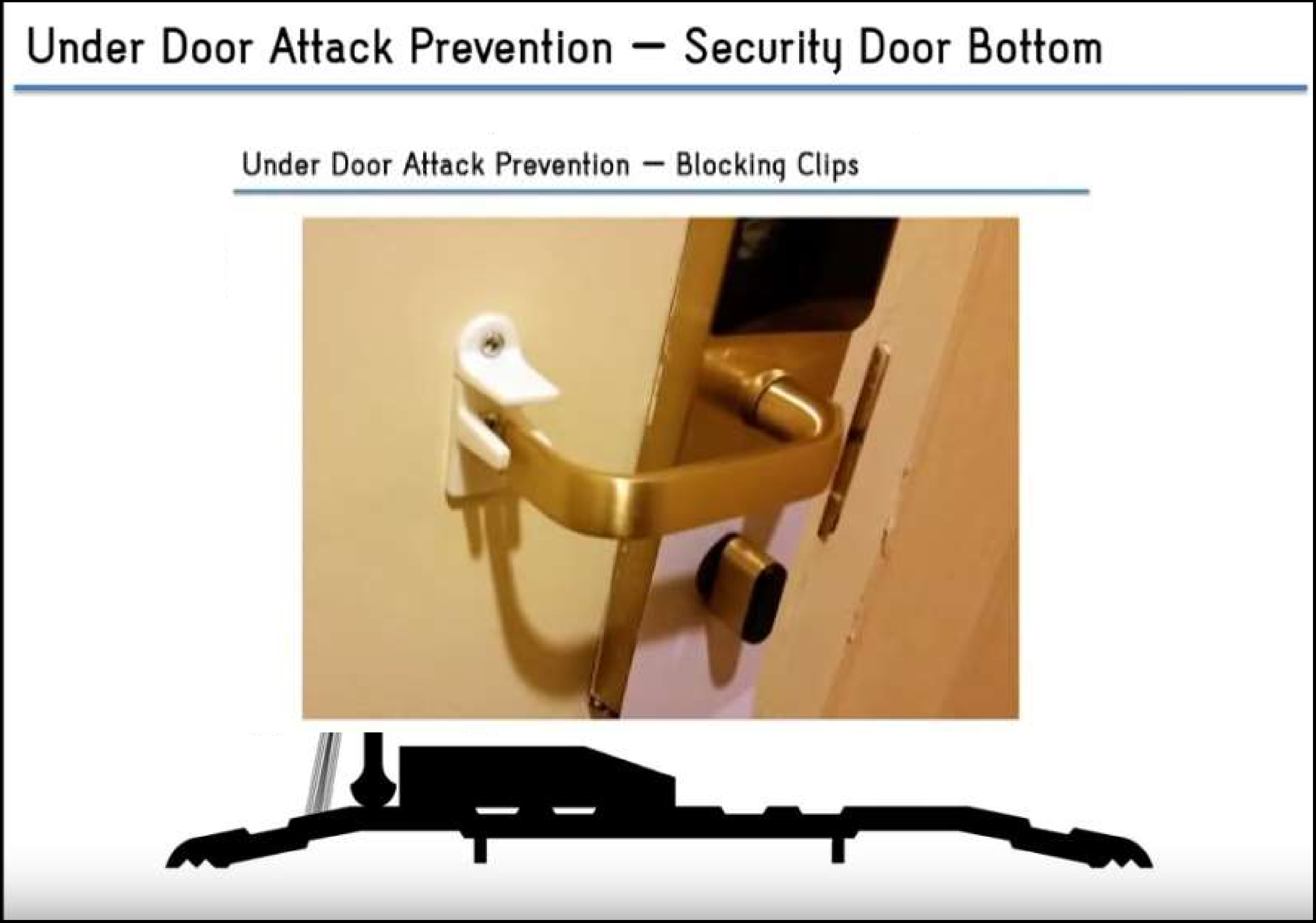


Under Door Attacks



Under Door Attacks

Under Door Prevention



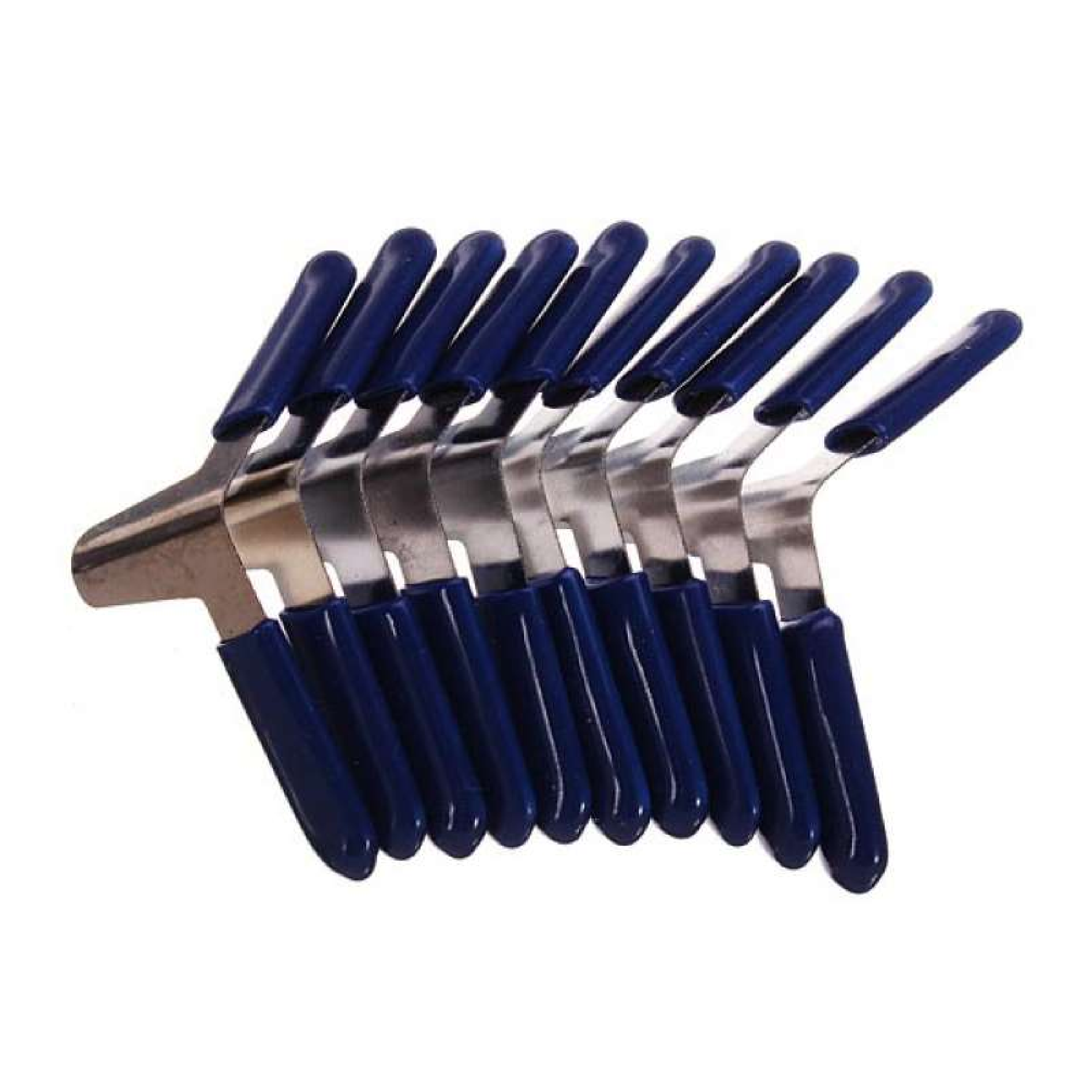
Under Door Attack Prevention – Security Door Bottom

Under Door Attack Prevention – Blocking Clips

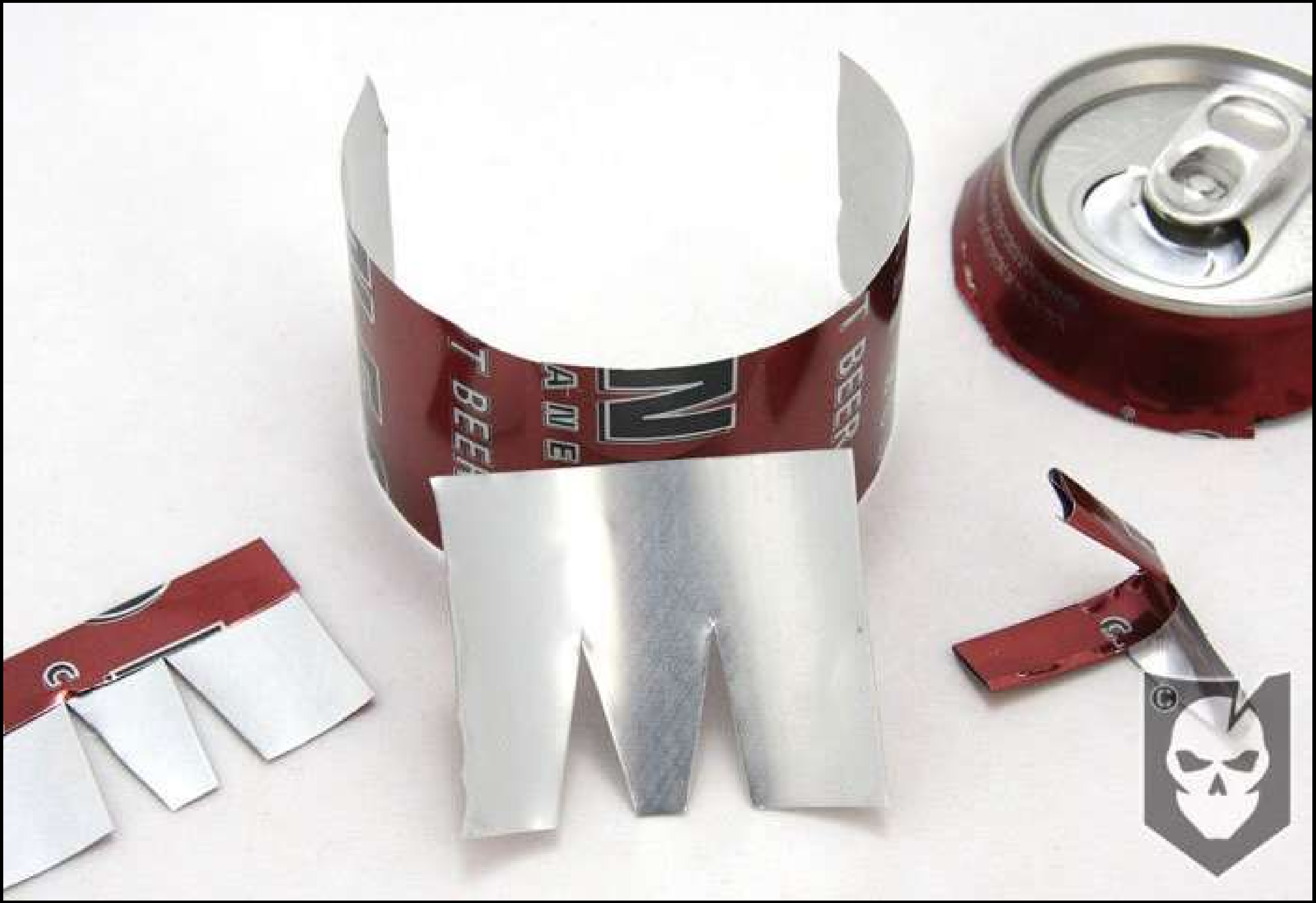
Padlocks

Padlocks

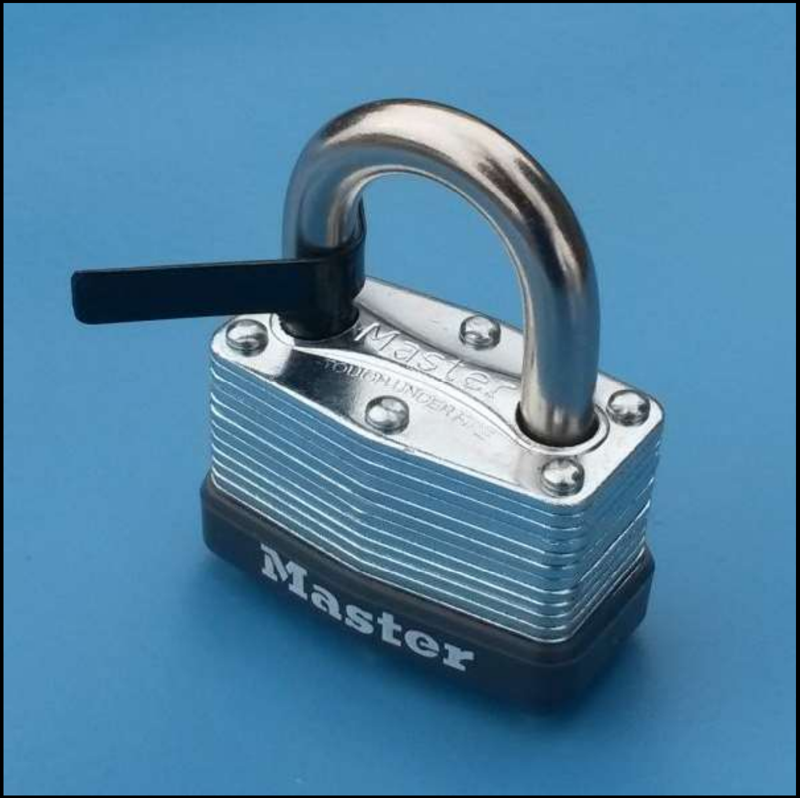
Padlock Shims

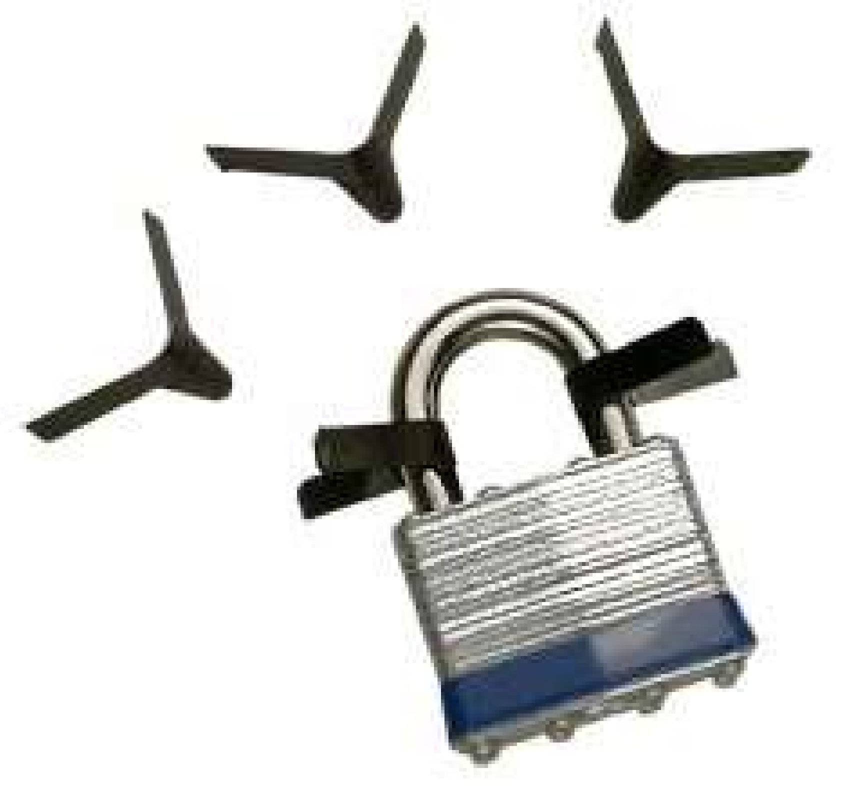


Padlock Shims - DIY



Padlocks





Padlock Shims - DIY

- Do NOT practice on locks you depend on
- Do NOT practice on locks you can’t open
- Your shims WILL break. If you cannot open it, you may render the lock inoperable

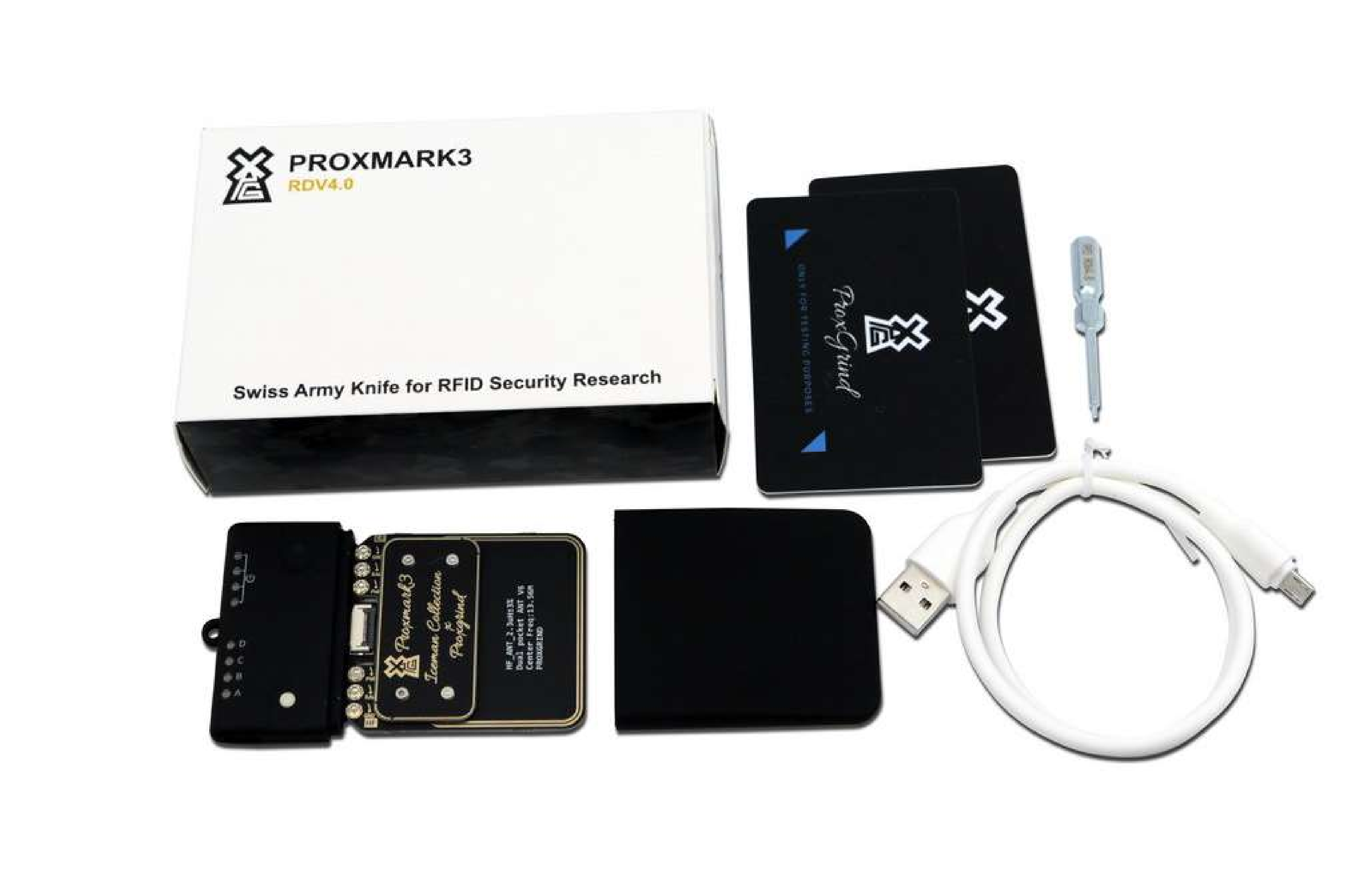
High Security Padlocks

- Use techniques that make shimming impossible
- Most common is ball bearings instead of spring loaded catch
- Indentation on shackle is round instead of wedge-shaped

Electronic Credentials

Attacking Electronic Credentials

Proxmark 3


PROXMARK3
RDV4.0
Swiss Army Knife for RFID Security Research
ProxGrind
ONLY FOR TESTING PURPOSES
Proxmark3
Iceman Collection
&
Proxgrind
HF_ANT_2.3x1.3X
Dual pocket ANT V6
Center Freq:13.56M
PROXGRIND

Proxmark 3

- Open Source Design
- Operates in:
  - Low Frequency (LF) 125KHz
  - High Frequecny (HF) 13.56MHz
- Reader AND Tag

Garage Openers

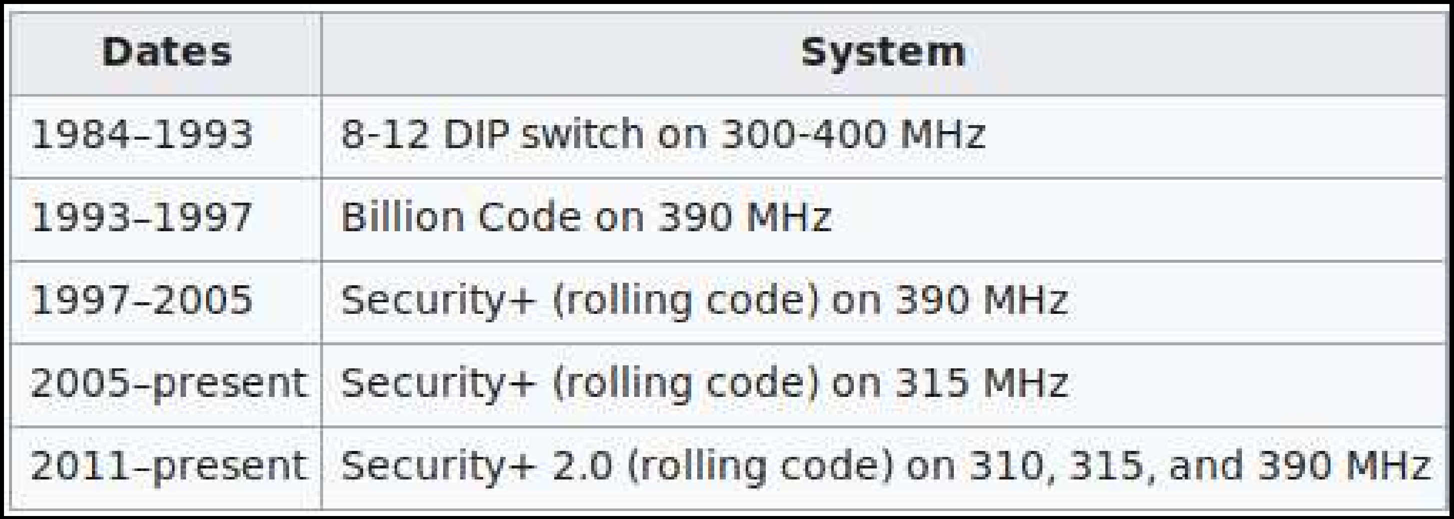
- Started as simple transmitter and receiver design (but opened neighbors as well)
- Second iteration used approx 4,096 codes
  - Small enough that unsophisticated attackers could go through a neighborhood and check

Garage Openers

- Iteration 2.5
  - Remotes preprogrammed to roughly 3.5 billion unique codes
- Third iteration uses frequency spectrum between 300-400MHz and rolling code (code hopping)
  - Also transmits a unique identifier for the remote control, sequence number, and sometimes an encrypted message

Garage Openers

- Standards used by Chamberlain, LiftMaster, and Craftsman



Dates	System
1984–1993	8-12 DIP switch on 300-400 MHz
1993–1997	Billion Code on 390 MHz
1997–2005	Security+ (rolling code) on 390 MHz
2005–present	Security+ (rolling code) on 315 MHz
2011–present	Security+ 2.0 (rolling code) on 310, 315, and 390 MHz

Car Security

- First remote keyless system introduced on...

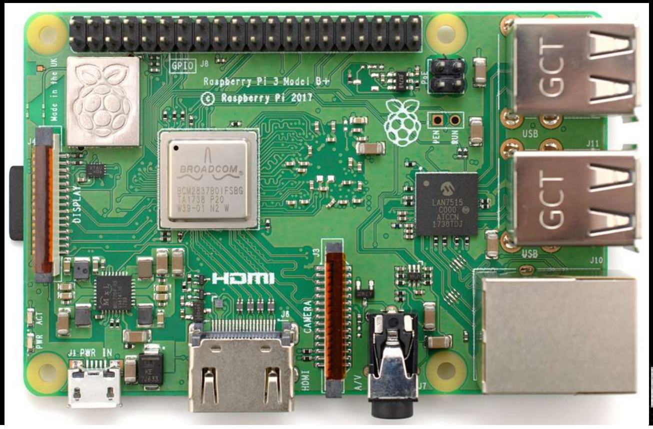
- 1984 Renault Fuego

Car Security

- Smart Key
  - Introduced by Mercedes-Benz as "Key-less Go" in 1998 on W220 S-Class
- Vulnerable to “Replay” attacks

Hacker Tools

- HackRF One - $300
- UberTooth One - $120
- Raspberry Pi 3 B+ - $35
- Kali Linux - $0



Faraday Cage

- Enclosure used to prevent electromagnetic fields
- Formed by a continuous (or mesh) conductive material
- External field causes electric charges within the conducting material to be distributed, canceling the field's effect in the cage's interior (and vice versa)

Faraday Bags

- Used by Law Enforcement to prevent signals (such as dead man switches) from reaching a device (i.e. a remote wipe)

CIA Op-Sec Fail

- Italy convicts 23 Americans for 2003 CIA rendition (practice of abducting and transferring individuals to third countries for detention and “interrogation”)
- UN considers these as “crimes against humanity”
- Metadata examination revealed relationship between multiple operatives

CIA Op-Sec Fail

- How was the relationship established?
- Operatives were supposed to used lined bags to prevent cell signals when not in use

Signal

- Wickr/Telegram/WhatsApp
- Secure Messaging App
- Encrypted communications (end to end and perfect forward secrecy)
- Disappearing messages

Want to hire me?

- Pentest your organization
- Give talks
- Teach how to enhance your privacy
- Train your staff to make your company more secure

Thank you

Closing points to remember:

Just because you’re paranoid doesn’t mean they aren’t after you

Use FOSS & tell everybody

Email:

Slides@SovereignCyberIndustries.com