

The Smoking Gun



Introduction

- Smooth-bore pistols and muskets were mass produced during the late 18th Century. (Revolutionary War times)
- The process of rifling, cutting internal helical grooves similar to a screw thread in the barrel of a fire arm, the fired bullet spins as it emerges from the barrel.
- Rifling greatly increased the accuracy of a bullet.

Introduction

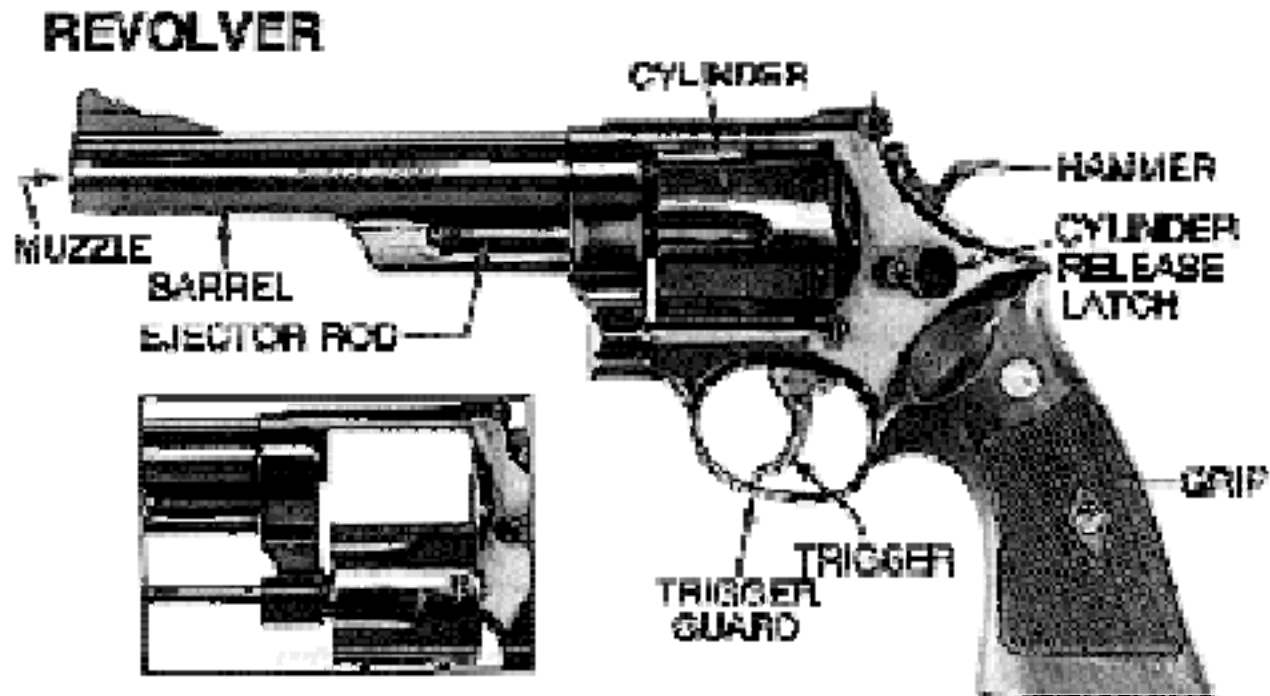
- The main benefit of rifling is that it imparts an individual identity to every single gun.
- When bullets are fired through the barrel, the rifling grooves create marks on the bullets surface in a pattern unique to that weapon, and a similar pattern of marks appears on any bullet fired from that weapon.
- The material that the bullets are made of is softer than that of a gun barrel.

Introduction

- Casings also carry clues about a particular gun.
- As casings are ejected from a semi-automatic the extractor makes certain marks on the casing.
- Also firing pins make distinctive marks on the primers of a casing.
- These marks vary from weapon to weapon, but are virtually identical on any cartridge case used in a particular firearm.

Classes of Weapons

- Revolvers



Classes of Weapons



Photo: <http://www.manufacturingcenter.com/tooling/archives/0601/0601hic.asp>

Classes of Weapons

- Semi-Automatic



Classes of Weapons

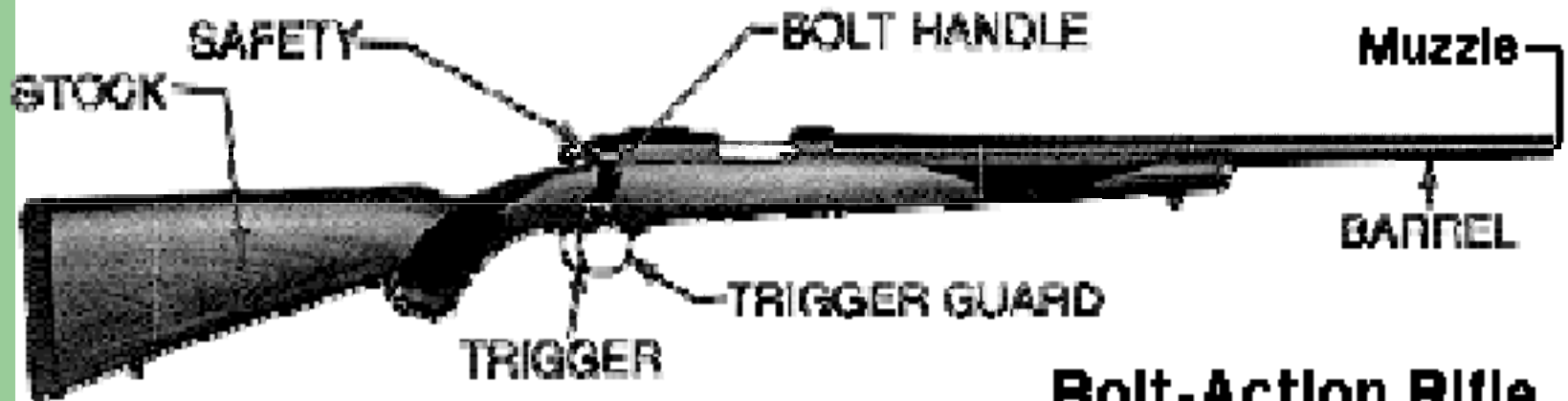
- Shotgun
- Shotguns do not have rifling



Photo: <http://www.mcsm.org/source.html>

Classes of Weapons

- Rifles



Bolt-Action Rifle

Photo: <http://www.mcsm.org/source.html>

Classes of Weapons



- Caliber
- The number of grooves and direction of the rifling in certain weapons differs.
 - Colt & Browning revolvers have six grooves in the rifling.
 - Colts grooves turn counter clockwise, Browning's turns clockwise.
 - Smith & Wesson have five grooves and turn clockwise.
- The Relative width between the rifling is called lands.

Firearm Fingerprints

- When the barrels are made the cutting tool that makes them leaves behind scratches across the barrel's internal surfaces that are unique to each individual weapon.
- Furthermore, these scratches or striations produce a characteristic set of marks on any bullet fired from that barrel.

Firearm Fingerprints

- By firing test bullets from the suspect weapon, then lining it up in a comparison microscope alongside the bullet from the crime scene, a positive match from these individual markings can be made with a greater accuracy.
- This process is not as easy as it may seem.
- Also the bullet may be in bad shape depending on what it struck.

Shotguns

- No rifling
- Produces many pellets or small be-be's.
 - A slug can also be fired from a shotgun.
- May be single or double barrel
 - Side by side or on top and bottom
 - May break the weapon open

Gunshot Wounds

- The appearance of a gunshot wound depends on the distance in which it was made.
- If a weapon is fired while pressed against the skin the hot gases coming out of the barrel will burn the skin around the muzzle of the gun.
- May also show a star shaped hole from the gases.
- If fired through clothing – may burn that area of clothing.

Gunshot Wounds

- If a weapon is fire at a short range then tattooing may occur.
- Tattooing is the burning of the skin in a distinctive pattern.
 - The tattooing is usually orange or brown in color when the victim was shot while alive.
 - Gray or yellow if shot when the victim was dead.
- To determine range the forensic examiner will need to fire the weapon from different distances.

Entry & Exit Wounds

- Examiners can expect to find patterns of soot around a bullet wound if it was made from a range of between 12 and 18 inches.
- Scattered specs of unburned and partially burned powder grains can be found if the shot was fired of up to 25 inches.
- Occasionally found when up to 36 inches.
- The Bullet wipe is the mark made when the bullet enters the body.

Entry & Exit Wounds

- The bullet wipe is comprised of, lead, carbon, oil, and dirt.
- Entry wounds are generally smaller than exit wounds.
 - Why is this?
- Shotgun wounds are caused by a spray of small bullets.
- The degree with which they spread can determine the distance with which they were shot.

Entry & Exit Wounds (Shotguns)

- When the gun is fired more than three feet away from the victim's body, the pattern of holes caused by the pellets penetrating the skin begins to spread.
- At ranges of more than four feet the severity of the wound begins to reduce as the pattern of pellet-holes widens still further, leaving no sign of powder markings.

Bullets & Cartridges

- Bullets from rifles and handguns

- Primers
- Firing pins
- Center fire vs. rim fire



- Bullets from shotguns

- Comprise a case, and primer cap
- Wad, a disk of compressed cardboard, and a plastic body filled with small pellets.

Sacco & Vanzetti

- See page 124-125

Georgi Markov

- See page 126-127

The USS Iowa

- See page 128