

FORENSIC BALLISTICS

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Mr. U Udaykanth Reddy

INTRODUCTION

Forensic ballistics is the area of forensic science concerned with the investigation of firearms and any other relevant evidence found at the scene of shooting, their connection to the firearm, and the identification of the shooter.

HOW A FIREARM FUNCTION

The gunpowder is set ablaze by the small fire from the priming compound; the gas created by the powder burning expands quickly inside the cartridge. The bullet is forced to exit from the cartridge and down the barrel by the expanding gas the bullet spins as it exits the barrel due to rifling imparted to the barrel.

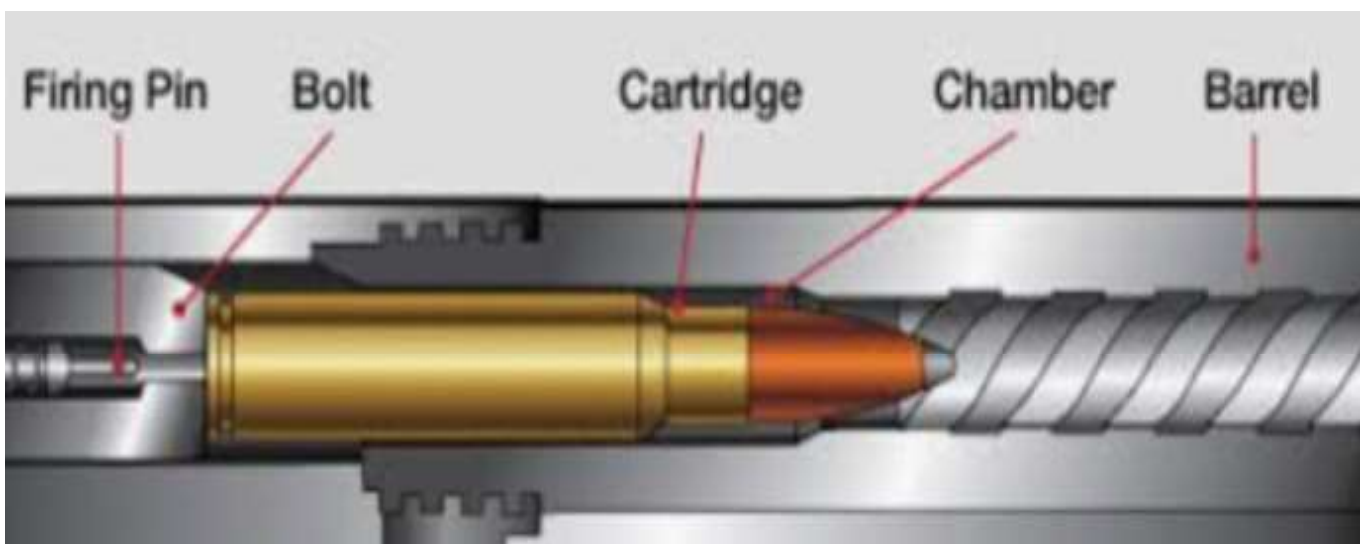


Fig 1: Image shows the internal working of a firearm

ASSORTMENT OF WEAPONS

There are numerous methods and locations for recovering firearm evidence. Guns can be found at shooting sites by crime scene investigators and transported to the lab. Typically, following adequate documentation or photography, each bullet, bullet fragment, cartridge case, shotshell wadding, etc., is collected separately and submitted to the lab. Obtaining bullet evidence in an emergency hospital setting is another option. In these situations, the material should be identified as a biohazard before being delivered to the lab. Each lab has written guidelines pertaining to the packing of evidence and its submission.

Bullets and slugs that miss their target sometimes embed themselves in surrounding materials, such as a wall or wood.

The easiest way to collect this evidence is to carefully cut out a bit of the substrate and submit it to the lab so that a weapon examiner can carefully extract it. This stops incorporating or eradicating any indications that might be essential for locating and matching the allegedly used firearm. When packing a firearm, the firearm may be recovered in the following conditions:

- Condition 1: Hammer down, safety on, empty chamber, no magazine in the weapon.
- Condition 2: Empty chamber, loaded magazine, hammer down, safety on.
- Condition 3: A chambered round, a full magazine, hammer down, and safety on.
- Condition 4: A chambered round, a loaded magazine, a cocked hammer, and safety engaged.

FORENSIC INVESTIGATIONS

The forensic experts in firearm examination study firearm features and ballistics to connect particular bullets or rounds to a particular firearm. From then, additional research aims to link the gun to a specific individual. A serial number on a gun may frequently be erased.

In some cases, the gun will be missing or stolen but other pieces of evidence such as prints, blood splatter, fibres of clothes, etc., may still be there. Additionally, scratches of serial numbers can frequently still be retrieved using an etching procedure that uses fluids or gels, potentially bringing the digits back to a readable state.

A bullet or a round leaves the muzzle of the rifle and descends the barrel. The barrel contains internal rifling. A gun's barrel has set grooves and landmarks called rifling that force the bullet to spin when it leaves the barrel. The raised portion in the rifling is land markings, while the depressions are the grooves.



Fig 2: Image shows the cross-section of a cartridge

Similar to imparting spin to a football, this spinning action makes the round move in the exact and extended course. In their rifles, various manufacturers use varying measurements and quantities of rifling. This enables forensic investigators in identifying particular gun makes and models.

The round acquires distinctive striations or marks as it passes through this rifling. The different marks on the cartridge formed as it leaves the pistol function much like a fingerprint.

In an effort to compare the shots fired in a controlled setting with those discovered at the crime, the shots will be fired into gelatin or any other material if the weapon used at the crime scene is recovered. Investigators utilise a substance called ballistic gelatin to ascertain the behaviour of a bullet being fired. Gelatin is a replica of human flesh that lacks any skeletal structure.

Going back to the gun that was found around the crime scene, you use the recovered weapon to contrast projectiles discharged from it with those discovered at the crime scene. This procedure will either confirm or refute the validity of the handgun. Given that bullet B has five marks and bullet A has four, the gun that fired bullet B will not have been used in the crime scene where bullet A was found.

When comparing firearms, cartridges are crucial pieces of evidence to take into account. A gun ejector or extractor marks as well as firing pin imprints can indicate whether it was the same weapon used in a crime scene.

REFERENCES

- Firearms Examination: Introduction. (n.d.). [Www.forensicsciencesimplified.org](https://www.forensicsciencesimplified.org). <https://www.forensicsciencesimplified.org/firearms/>
- Ballistics - Forensic Yard. (n.d.). [Forensicyard.com](https://forensicyard.com). Retrieved February 12, 2023, from <https://forensicyard.com/category/forensicsarticles/ballistics/>
- Firearms evidence collection procedures introduction. <https://www.crime-scene-investigator.net/CAfirearms.pdf>
- (2023). Study.com. <https://study.com/academy/lesson/ballistics-definition-lesson.html>
- B, Kumar. (2019, December 6). Introduction to Forensic Ballistics. <https://www.forensicscienceexpert.com/2019/12/introduction-to-forensic-ballistics.html>

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- Fig 1-2: How a cartridge is fired. www.hunter-ed.com. Retrieved February 12, 2023, from https://www.hunter-ed.com/newsouthwales-firearms/studyGuide/How-a-cartridge-is-fired/202601_144073/