

Catapults and Trebuchets



Mr. Lauster

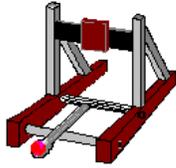
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Tech Ed



Introduction

- Catapult, device used to throw an object over a distance. A catapult can be as small as a rubber band slingshot used to skim rocks across a pond or as large as the 90-m (300-ft) long steam units used to launch airplanes from aircraft carriers. In Britain, aircraft carrier catapults are referred to as accelerators, which is perhaps a more accurate term for what these machines do.



History of Catapults

- The catapult was invented around 400 BC in Greek town Syracuse.
- The very first catapult invented resembled a crossbow. It was called the Gastraphete.
- The Greeks, impressed by the destructive power of this new weapon, created a bigger version called a Ballista and it was used as a defense weapon against raiding armies.



Application of Catapults

Aircraft Launchers

The word catapult also refers to a device that is used on aircraft carriers to help launch airplanes. Catapults are built into the surface of a carrier's flight deck. A tow bar on the catapult slides into a holder on the forward wheel of an airplane. When the catapult is activated, the tow bar pulls the airplane down the catapult track and releases itself at the very end of the deck to allow the airplane to fly off the ship.

The steam catapult was invented in 1952 by Britain's Royal Navy to improve the launch of the era's new jet airplanes from carriers. Steam catapults draw their power directly from the heat of the ship's engines. Since aircraft carrier engines are large, they have an enormous amount of power. The steam catapult uses this power to fling airplanes weighing as much as 32,000 kg (71,000 lb) into the air using only 90 m (300 ft) of deck space.

Application of Catapults

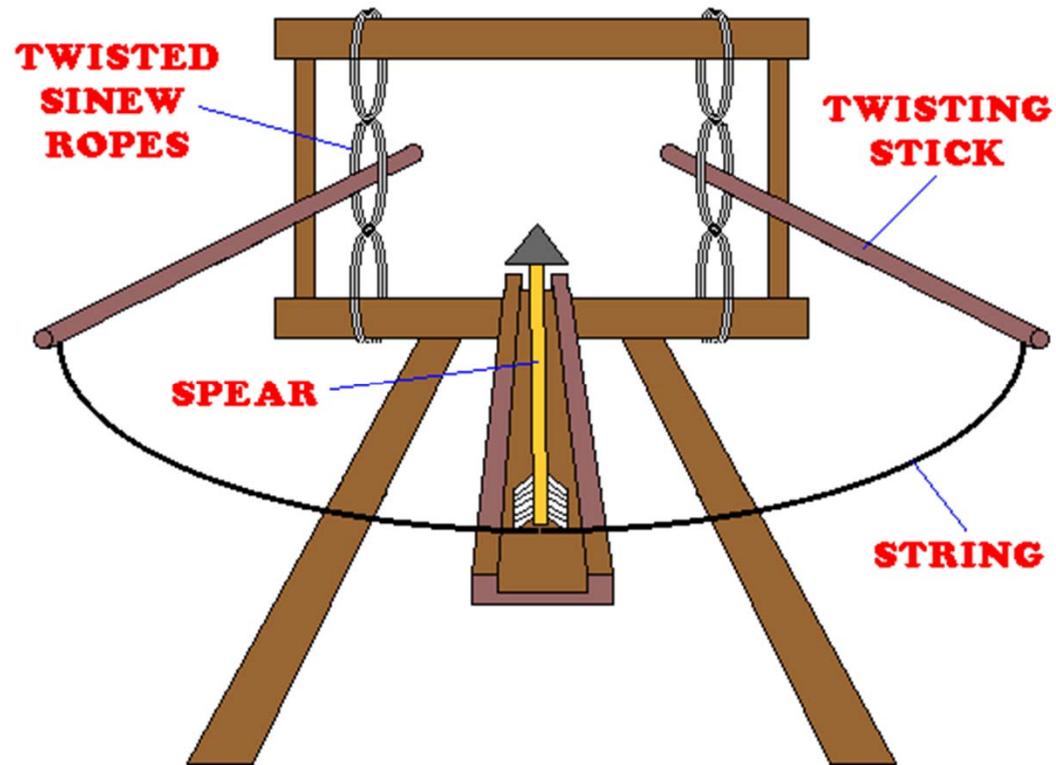
Siege Engines

The catapult was a special type of siege engine, a large device used to attack a fortress or a city. Catapults were used in ancient and medieval warfare until the introduction of the gunpowder cannon in the 14th century. A catapult could hurl large stones, spears, or other projectiles at an enemy, but was difficult to aim. A catapult was sometimes mounted on a wheeled cart, and as an army changed positions, the catapult could be moved accordingly. Some catapults were mounted permanently within fortresses and used for defense against attackers. Many different types of catapults were invented and used. Three of the most common were the ballista, the mangonel, and the trebuchet.

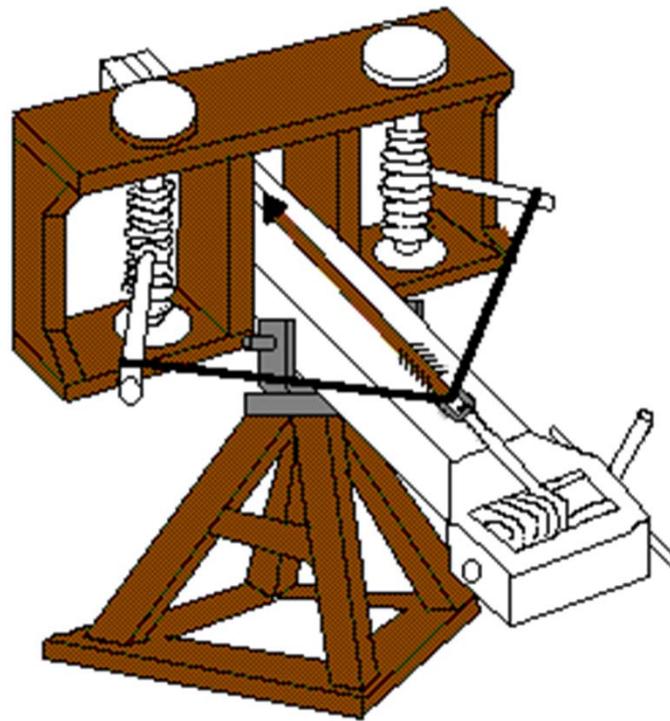
Ballista

- The oldest form of catapult used in siege warfare. The Ballista is best described as a giant crossbow which fired spears instead of arrows. There were many types of Ballista that were popular with the Greeks and Romans, but the one thing they have in common is that they were all powered by twisted sinew ropes. The ballista was accurate and could fire spears a great distance but they were difficult to build and they were limited to hitting only what they could see.

Ballista Operation



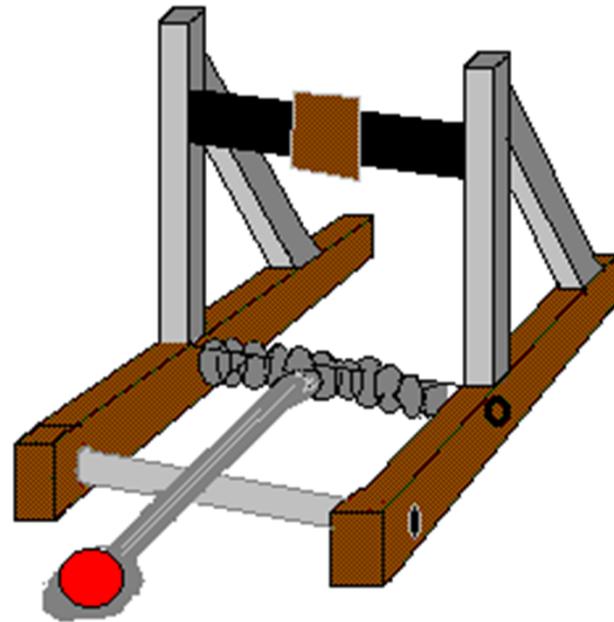
Ballista Operation



Mangonel

- Also called the Onager, was developed by the Romans. It had one throwing arm whose end was connected to a base by twisted sinew ropes similar to the Greek's Ballista. It was light, easy to move and could throw rock as well as fire. It was inaccurate however. Both the Ballista and the Mangonel are called *Torsion Machines* because they are powered by a *twisting force* called **Torsion**

Mangonel Operation



Mangonel Operation



Trebuchet

Traction Trebuchet - Used people power to haul down the shorter end of the beam, which in turn flipped up a sling that was connected to the longer end. As the longer end reached its apex, the sling opened releasing a large stone or other object.

Counterpoise Trebuchet - Worked the same way but a counterweight was used on the short end of the beam. To fire it they pulled the long end of the beam down and then released it. Both types of Trebuchet are *Non-torsion Machines*.

Operation of Trebuchet

