THE CIVIL WAR – ARTILLERY - FUSES

The American Civil War is often called the first "modern war" for many reasons. It was the first war that was waged against civilians and civilian infrastructure in order to destroy the opponent's ability to engage in battle. It was the first war that called for a total mobilization of all resources on both sides. Armies of the North and South employed the newest technological weapons and devices in battle. Finally, it was a war in which the armies were broken into specialized arms. Cavalry had long been a part of warfare, but the Civil War created separate commands and separate units for infantry, cavalry and artillery. Artillery played important roles at Antietam, Malvern Hill and Gettysburg.

Artillery units used a variety of projectiles during the war. To be most effective artillery rounds needed to explode at the proper time. This required a time fuse that could be adjusted to battle conditions. The most common time fuses were paper cylinders packed with slow-burning black powder. There were markings on the paper wrapping for shortening the burning time. When the gunner had established the range, one of the members of his crew gave him a corresponding elevation from a Table of Fire that was glued inside the artillery box. He then cut the fuse to the length required for the time of flight. The fuse cut to the proper length was then inserted into wooden or metallic fuse plugs in the fuse hole of the projectile. Beginning in 1862, the North had all paper time fuses manufactured at the Frankford Arsenal in Pennsylvania. Northern fuses performed in consistent fashion throughout the war. Confederate fuses were made at a variety of establishments. As a result, the South's fuses were not consistent. This was a problem for the South, especially during the critical battles at Gettysburg.

Metal fuses were also used in the Civil War. The Bormann time fuse screwed into the fuse hole of the projectile. A hole was punched into the top of the Bormann fuse at a mark that corresponded to the desired length of burning time. Metal fuses were not more accurate and many units preferred using only paper fuses.

Both time fuse systems relied on the flame from the exploding propellant charge in the cannon tube to ignite the powder in the fuse. After the fuse powder had burned down through the set number of seconds the fuse flame entered the powder chamber inside the projectile and the projectile exploded.

Finally, projectiles could be fitted with percussion or concussion fuses. These caused the shell to explode on impact with the target. They were not as reliable as paper or Bormann fuses. Percussion fuses often would not ignite if the shell did hit the target at an angle other than 90^{o}. Concussion fuses ignited at all angles, but they often exploded in the cannon tube or before reaching their targets.