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# Grenades

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U.S. forces included some 500 marines, 500 Rangers, 5,000 paratroopers of the 82d Airborne Division, and perhaps 400 members of the six-nation Caribbean force. Total American casualties were 18 dead and 67 wounded.

The last U.S. combatants departed by December 1983, but 250 U.S. military personnel remained as part of a multinational occupation force to ensure a peaceful transition period. Its status changed on 4 December 1984, when a newly elected prime minister requested its continued presence until Grenada could organize, equip, and train its own administrators and police. The last U.S. forces left the island in September 1985.

See also AIRBORNE FORCES, DEVELOPMENT AND EMPLOYMENT OF; SCHWARZKOPF, H. NORMAN.

**Further reading:** Bolger, Daniel P. *Americans at War, 1975–1986: An Era of Violent Peace*. Novato, Calif.: Presidio Press, 1988; Cole, Ronald H. *Operation Urgent Fury: The Planning and Execution of Joint Operations in Grenada*. Washington, D.C.: Joint History Office, Office of the Chairman of the Joint Chiefs of Staff, 1997; Dunn, Peter M., and Bruce W. Watson, eds. *American Intervention in Grenada: The Implications of Operation "Urgent Fury"*. Boulder, Colo.: Westview, 1985.

— James H. Willbanks

## grenades

Grenades have been in existence since the 15th century and are generally used in tandem with infantry small arms for siege (trench) and urban warfare. These devices also provide the basis for numerous forms of booby traps used in both conventional and unconventional warfare.

Two principal categories of grenades exist. The first is the "hand grenade," which is thrown; the second is the "launched grenade," which is based upon a form of projectile. Some hand grenades could be launched from a rifle, blurring this distinction. The U.S. military has used both categories of grenades over its history but is relying increasingly upon launched grenades because of their greater stand-off capability and, in some cases, higher rates of fire.

U.S. hand grenades can be classified into many types. These include defensive (blast and fragmentation), offensive (blast only), antitank, chemical, pyrotechnic, illumination, and smoke devices. Common fragmentation grenades, used in the AMERICAN REVOLUTIONARY WAR, were based upon crude, gunpowder-filled iron spheres. Initial detonation methods were lighted fuses. As these devices evolved, true fuzing systems based upon impact-fuzing (external percussion) and time-fuzing (pin-removal) emerged. The Ketchum grenade employed in the CIVIL WAR was a one- to five-pound, oblong-shaped, fin-stabilized percussion device used in siege warfare. The Hanes Excelsior, also deployed in this

war, looked like a miniature naval mine, with 14 nipples resting inside an outer spherical case. When thrown, at least one of the caps would be crushed, detonating the grenade. This device proved too dangerous for wide-scale use.

Sources mention another U.S. percussion grenade as existing prior to WORLD WAR I. It was composed of a lightly scored (for fragmentation purposes) iron cylinder with a rope streamer. The detonating mechanism was based on a fulminate primer, which, as in the Ketchum grenade, was set at the tip of the device. Going into World War I, no serviceable U.S. hand grenades existed. While an attempt was made to produce a grenade for use by the AMERICAN EXPEDITIONARY FORCE, it was a failure. As a result, U.S. forces utilized the British No. 36 "Mills Bomb" of 1915 and the French F1 defensive grenade.

By the onset of WORLD WAR II, numerous U.S. grenade designs existed. The most famous is the time-fuzed Mk-II "pineapple" defensive grenade, a variant of the venerable "Mills Bomb." The burst radius was 30 yards and the time delay was set at five seconds. This grenade was superseded by the egg-shaped Korean-era M26 series, which had a smaller burst area but could be thrown farther and had a better fragmentation pattern. Irritant grenades have been based on the World War II M6 series, which was filled with CN-DM (chloroacetophenone and diphenylaminechlorarsine), and the M25 series filled with CN, DM, and/or CS (ortho-chloro-benzylidene malonitrile), which saw service in the KOREAN WAR and VIETNAM WAR. More recently, "flash-bang" grenades have been used in peacekeeping operations, for hostage rescues, and in the seizure of war criminals. These "nonlethal" devices overwhelm the auditory and visual human senses, rendering targeted individuals incapable of resistance.

Launched grenades in use by U.S. forces have followed three forms of development: The first form is based upon dedicated rifle grenades that can be projected from the tip of a rifle, generally by some sort of special cartridge and adapter system. An example of this is the pre-World War II M1 series launcher that fit onto the .30 caliber M1093 rifle and fired the 1.5 pound M9 high-explosive antitank grenade. This technology has since become obsolete for U.S. forces.

The second form is based upon a combination rifle and grenade-launcher system. The current M203 40 mm single-shot grenade launcher that fits under the barrel of the M-16 rifle is a prime example of this form. The projected OICW system—based upon a magazine feed, 20 mm or 30 mm grenade launcher, and a 5.56 mm rifle assembly—represents the next generation of this form.

The third form is based upon a dedicated 40 mm grenade-launcher system. This can be seen in the single-shot M79 "bloop" of the Vietnam War and the two-man crew-served Mk-19 "40 mm Machine Gun" in current use

by U.S. forces. The Mk-19 is a devastating weapon against exposed infantry and lightly armored vehicles, with the M430 HEDP grenade able to penetrate armor up to two inches thick. This launcher has an effective range out to 1,600 meters and a sustained rate of fire of 40 rounds a minute.

Besides fragmentation and high-explosive launched grenades, nonlethal designs for riot control and peace-keeping needs have also developed. An advanced ring-airfoil design for improved accuracy emerged in the early 1970s. This system, the M743 Sting Ring Airfoil Grenade (RAG), was produced by the U.S. Army but was never fielded. Currently, spongy, nonlethal 40 mm grenades are in use for the M203 launcher. Such grenades, which focus kinetic force on their targets, also possess marking dye or riot control agent additives in some instances.

See also SMALL ARMS: RIFLES.

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— Robert J. Bunker

### **Grierson, Benjamin H.** (1826–1911) *U.S.*

#### *Army general*

Born on 8 July 1826 at Pittsburgh, Pennsylvania, Benjamin Henry Grierson attended an academy in Youngstown, Ohio, and after graduating taught music in Youngstown and in Jacksonville, Illinois. He gave up teaching to become a merchant in Meredosia, Illinois. At the outbreak of the Civil War, he served as volunteer aide-de-camp to the Federal brigadier general Benjamin Prentiss. In October 1861 Grierson, who had been kicked in the face by a horse and left disfigured for life—and consequently harbored a fear of horses—was commissioned a major in the 6th Illinois Cavalry. In April 1862 he became colonel.

Over the next year Grierson led his regiment, and eventually a brigade, in numerous actions and raids in Tennessee and northern Mississippi. During the VICKSBURG campaign he commanded a cavalry brigade in the Army of the Tennessee. In April 1863 Major General Ulysses S. GRANT ordered Grierson to mount a raid into Mississippi to divert Confederate attention from the effort against Vicksburg.

On 17 April Grierson set out from La Grange, Tennessee, with 1,700 troopers in three cavalry regiments and a battery of light artillery. In one of the most spectacular raids of the war, Grierson's command covered 800 miles,

paroled 500 Confederate soldiers, captured 1,000 horses and mules, destroyed tons of arms and supplies, and wrecked miles of railroad before riding into Union-held Baton Rouge on 2 May. For his achievement, Grierson won Grant's praise and promotion to brigadier general of U.S. Volunteers.

After serving briefly in the Department of the Gulf, Grierson returned to Tennessee. In July 1863 he took command of a cavalry division in XVI Corps, which he led during the MERIDIAN CAMPAIGN. In June 1864 Grierson led part of the force that was routed by Major General Nathan Bedford FORREST's Confederates at Brice's Crossroads. Commanding the Cavalry Corps, District of West Tennessee, and later that of the Military Division of West Mississippi, Grierson conducted a series of successful raids in Tennessee and Mississippi, and he participated in operations against Mobile.

Brevetted major general of volunteers in 1865, Grierson was given the substantive rank in March 1866 (to rank from May 1865) and was mustered out in April. Offered a regular army commission, Grierson became colonel of the 10th Cavalry Regiment, one of the newly authorized African-American regiments. In 1867 he received brevets to brigadier and major general in the U.S. Army in recognition of his war service.

For more than 20 years Grierson led his BUFFALO SOLDIERS against hostile Indians in the Southwest. Promoted to brigadier general in April 1890, Grierson retired three months later. He died at Omena, Michigan, on 31 August 1911.

See also AFRICAN AMERICANS IN THE MILITARY; AMERICAN INDIAN WARS; APACHE WARS; CIVIL WAR, LAND OVERVIEW; MACKENZIE, RANALD S.; MERRITT, WESLEY; MILES, NELSON A.

**Further reading:** Leckie, Robert H. *The Buffalo Soldiers: A Narrative of the Negro Cavalry in the West*. Norman: University of Oklahoma Press, 1967; Leckie, Robert H., and Shirley A. Leckie. *Unlikely Warriors: General Benjamin H. Grierson and His Family*. Norman: University of Oklahoma Press, 1998; Utley, Robert Marshall. *Frontier Regulars: The United States Army and the Indian, 1866–1891*. New York: Macmillan, 1973.

— Jim M. Kerbow

### **Groves, Leslie R.** (1896–1970) *U.S. Army officer and engineer, officer-in-charge of the Manhattan Project to develop an atomic bomb*

Born on 17 August 1896 at Albany, New York, Leslie Richard Groves was educated at the University of Washington, the Massachusetts Institute of Technology, the U.S. Military Academy, West Point (1916–18), and the Army Engineer