Good morning, gentlemen!

We often have training subjects which are interesting and enjoyable. This one may be interesting, but probably not so enjoyable. In this class, you will get up close and personal with barbed wire and with German mines, which are highly explosive, very sensitive to any disturbance, and are probably observed and covered with machinegun and mortar fire. What could be more interesting than that?

Mines and barbed wire may not have a major role in reenactments, but they did in World War II. You should have this knowledge for future living history presentations and for battle reenactments.

I will provide you with a set of notes on this class, so you can keep them for reference. You might want to keep them and pull them out once in a while for review, for example, later this afternoon when we go out for the breaching and assault exercise.

A reminder on my policy on questions—if you have any questions or need clarification on anything I mention in this class, ask right then! I don't want anybody to miss anything later in the class because they are wondering about something earlier in the class. So ask away!
The enemy will frequently strengthen his defensive positions by use of mines, barbed wire, and other obstacles to make an approach difficult. Germans have excellent booby traps, mines, and other barrier material; and they are expert in using them. These barriers and their covering fire can slow and even stop an attack and can cause high casualties.

Largescale barbed wire clearing and minefield clearing are the missions of combat engineer units. However, engineer units are frequently not available to help us accomplish our assigned missions. Our infantry small units must be trained to tackle these obstacles, an often difficult and dangerous task that is nevertheless critical to mission accomplishment.
Barriers by themselves will NOT stop an enemy penetration. Wire and mines alone can only SLOW an enemy advance.

To STOP an enemy attack, barriers must be covered by observation and fire.

Always remember this!

Barbed wire and mines are not designed to stop an enemy threat by themselves. Any barrier or obstacle can be breached if enough skill and resources are applied. Wire and mines can slow an enemy advance, but stopping it requires that the barriers be under observation and covered by fire. When an attacker is slowed by obstacles, the defender can more easily destroy him by direct and indirect fire. Always remember this.
Small infantry units must often breach narrow lanes in enemy barriers.

Lanes must be made safe and passable, then marked so follow-on troops will not wander out of the safe area.

At the infantry small unit level, you will not clear large areas of mines and wire (as previously mentioned, this is for the combat engineers); however you will breach these barriers and establish narrow lanes through which your unit may pass. These lanes must be rendered safe and passable and marked so that those who follow you do not wander out of the safe area.
Skill and stealth are essential in minefield and wire breaching.

Your best advantages in breaching operations are skill and stealth. Skill and practice are required because of the need to combine speed with caution. Mines need to be cleared or marked, but you don't have all night to do it. Wire must be cut and cleared, but unless you want to be stitched by the machine gun team covering the wire, it must be done silently.
If stealth is not possible, other means must be used.

- Use terrain as cover whenever possible
- Intense fire support, direct and indirect
- Smoke screen

If circumstances do not permit stealth -- for example, if the breaching is part of a general assault or must be done in daylight -- the actual breach must be done using terrain for cover to the extent possible and covered by the most intense fire support, direct and indirect, and supported by smoke.
Types of Wire Barriers:

- Horizontal strand wire fence
- Apron wire fence
- Double apron wire fence
- Concertina wire
- Tanglefoot
- Combinations

Barbed wire entanglements are used to mark no-entry areas to local populations and friendly forces as well as to slow enemy approach and make them vulnerable to supporting fires. Barbed wire installations are constructed in several ways:

- Horizontal strand wire fence
- Apron wire fence
- Double apron wire fences
- Concertina wire
- Tanglefoot
- Combinations of several types
Simple fences with horizontal strands are used to mark prohibited areas (e.g., mine fields, cantonments). These are easy to penetrate, and serve no defensive purpose.
Apron fences are harder to breach and serve to provide at least rudimentary defensive barriers. A single apron barrier extends to one side of the line of stakes; a double apron extends to both enemy and friendly sides of the stake line.
A **double apron** extends to both enemy and friendly sides of the stake line.
**Concertina** is constructed of circular loops of wire attached at two points to each adjacent loop, with the points rotated alternately 90 degrees. This design allows the wire to be carried as a flat roll, then extended like the musical instrument to provide a dense entanglement. Concertina is usually installed with other wire constructions (particularly double apron) and stacked to provide a tall, dense barrier.
Tanglefoot is an old but effective barrier. It has been used since the American Civil War—before there was barbed wire—when telegraph wire served the purpose. The wire is stretched around stakes in a flat crisscross pattern just below knee height. This makes a swift attack difficult to maintain by slowing and tripping the assault force.
Wire entanglements frequently use multiple combined configurations to complicate the attacker’s breaching tasks.
Breaching Wire

Small infantry units have limited options for breaching wire obstacles. The two methods are:

- Demolitions
- Cutting by hand

Breaching wire:
There are several ways of breaching a wire entanglement; we will concentrate on those available to small infantry units.

a. **Demolitions.** The quickest way to open a lane in wire involves carefully positioned high explosive charges. A satchel charge may be used, but the **Bangalore torpedo**, when available, is the best tool because it is constructed to allow clearance of a straight, narrow path through wire.

b. **Cutting by hand** is a slower method, but sometimes the only one available.

We will discuss the Bangalore torpedo first.
The Bangalore Torpedo is an explosive charge, encased in steel pipe, in several portable connectable sections, and designed to blast long, narrow gaps in barbed wire or minefields.
The bangalore is issued in tubular sections with connectors and a convex end cap at the front to facilitate pushing over the ground.
The torpedo is detonated by use of a cold priming system; the basic parts of this are best rigged to the rearmost tube before the assault to reduce the exposed work time.

Final assembly will be done at the wire obstacle, preferably under cover of darkness, terrain, smoke, and covering fire.

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Use of the bangalore: Platoon leader recons and selects a breach point in the enemy wire. One squad is selected as breach squad and supplied with a bangalore. For convenience, the squad carries the bangalore disassembled. A second squad is designated the assault squad.

The breach squad assembles at the closest covered position from the selected breach point, and the platoon sets up a base of fire. The enemy is engaged with suppressing fire and smoke in support of the breach squad.

The breach squad advances under covering fire and smoke to the breach point and assembles the bangalore. When the torpedo is in place, the squad takes available cover, signals “fire in the hole!”, and covers itself, helmets toward the explosion and mouths open to prevent ear overpressure, then the selected squad member detonates the torpedo with the blasting device or time fuse.

Once the breach is clear, the assault squad moves swiftly through the cleared lane and establishes fire on the far side to the front and flanks to allow the balance of the platoon to pass through.
Breaching Wire by Hand

- If demolitions are not available, the wire obstacles must be cut by hand.
- Must be done with stealth, preferably by night infiltration.
- In the assault, the attack methods are the same as with demolitions, but the time required to penetrate the wire is longer.

Breaching wire by hand

In the absence of appropriate demolitions, wire must be cleared by hand with wire cutters. Obviously this is the only way to accomplish the breach with stealth, and this is the technique that will routinely be used for infiltration.

In the assault, the tactical method is the same as with demolitions, the principal difference being that the time required to cut and secure wire entanglements is longer than when we simply blow them away.
Cutting wire: The wire cutting team generally consists of two men per lane to be cleared. One cuts wire, the other assists.

When exposed, smoke is generally used to cover the breaching operation. The cutter moves ahead at a low crawl and cuts the wire one strand at a time. The cutter requires wire cutters, and both should have work gloves.

When strung, wire is generally under some tension, and simply snipping through a strand without securing it can result in the ends whipping back.
Wire Cutting Techniques

- Before breaching, inspect wire quickly to discover any booby traps or early warning devices.

- Slide head first on the back under the lower strands. Push forward with shoulders and heels. Keep your weapon lengthwise over your body; hold the barbed wire up with one hand as you pass under. Let the wire slide over the weapon so it will not catch on clothing and web gear.

Before breaching, inspect wire quickly to discover any booby traps or early warning devices (e.g., tin can with pebbles strung from wire strand).

Slide head first on the back under the lower strands. Push forward with shoulders and heels. Keep your weapon lengthwise over your body; hold the barbed wire up with one hand as you pass under. Let the wire slide over the weapon so it will not catch on clothing and web gear.
Wire Cutting Techniques

- Cut the lower strands one at a time. If infiltrating, hold the wire with a cloth wrapped around it to reduce noise, or have the #2 man hold the strand on one side while you hold on the other and use your free hand to cut. Do NOT let the ends snap free.

- Try to cut the wire next to its attachment to a stake, holding the strand firmly and cutting between your hand and the stake.

- If you are infiltrating, leave the top strand in place; your path through will be harder to detect. If possible, do not cut the strands through, but cut partly and then bend the strand back and forth until it breaks; this prevents the “twang” that may alert the enemy.

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As with wire, mine fields can be breached by hand or by demolitions. If you are infiltrating the barrier, demolitions are obviously not suitable.

**Demolitions.** Satchel charges and bangalores will generally detonate pressure-fired mines. Magnetic mines are generally used on large charges to disable tanks. The blast will also clear or detonate any mines rigged to fire by trip wire.

**Clearing by hand.** Tactically the procedure is similar to tactical breaching of wire; in fact, wire and mines are often deployed together, with mines emplaced on the enemy side of the wire entanglement.
Manual breaching of mined areas requires skill and careful execution; the breacher is responsible not only for his own safety, but also of the lives and safety of the soldiers who will follow him through the cleared lane.

Mined areas are typically marked with various warning devices. The Laws of War require that minefields be marked, but this is not always the case. In general, the marking protects friendly troops and discourages the enemy from entering the area.

The breaching team for a mined area is generally smaller than that for a wire breach, since it is advisable to reduce the number of potential casualties in case of an inadvertent detonation. A breaching team usually consists of two men, moving in file at a crawl.
The lead man probes carefully for solid buried objects while looking for any detonating devices exposed above the soil. The actual probe is accomplished with knife or bayonet, in the following manner:

-- From the prone position, examine the ground to the front, left, and right, looking for disturbed earth, exposed mine parts, or other signs of danger. Each area examined should be to the immediate front close enough to look down on the area being inspected.

-- Probe the ground to the front methodically, searching for any solid subsoil object. If a solid object is detected, probe around it to find an edge and carefully establish its size and shape. If the object is consistent with a known mine, search again carefully for trips or booby traps, and then carefully remove earth from the top, starting at the near edge and exposing the mine.
Mine Clearing by Hand

-- If possible, mark the mine. The mine may be removed and disarmed if the soldier is familiar with mine operation and there is no evidence of booby traps.

--The second soldier maintains contact with the prober and passes information back as needed to the rest of the detachment. He may also mark the cleared lane as the team progresses -- small strips of cloth or other markers to assure that the soldiers following remain in lane.
The German S-mine ("Bouncing Betty") is a steel cylinder approximately 5.9 inches tall without its sensor and around 4 inches in diameter. A steel rod protruding from the mine's top holds the main fuze, where its trigger or sensor is attached. The SMi-35 has a central fuze, while the SMi-44 has an offset fuze.

The S-mine is normally triggered by a three-pronged pressure fuze. It can also be modified to be triggered by a tripwire. A special tripwire adapter is provided by the German army. The steel tube that holds the fuze is threaded to accept any standard German ignition or trigger, allowing the sensor to be removed and the mine to be deliberately triggered by a human operator.
It weighs approximately 8.8 lb., with the weight depending on whether it is loaded with the lighter powdered or the heavier poured TNT. The main charge of the mine uses TNT as its explosive; the propelling charge is black powder. The standard pressure sensor uses a percussion cap to ignite it.

The S-mine is constructed mostly of metal, so it can be easily detected by mine detectors. However, such expensive and bulky equipment is rarely available to infantry units and is prone to malfunction.
The main fuze is designed to delay the firing of the propelling charge for approximately four seconds after the mine is triggered. The explosion of the propelling charge sends the mine upwards into the air and activates three short-delay pellets between the propellant charge and the three detonators. These short-delay pellets delay the mine's detonation long enough for it to reach an appropriate height before exploding. The standard pressure sensor is designed to activate if depressed by a weight of roughly 15 lb. or greater. This ensures the mine is not detonated by wildlife or natural impact of blowing leaves, branches, or other normally occurring phenomena.
When triggered, the mine functions in two stages (see diagram). First, the mine is fired 0.9 to 1.5 meters (3 to 5 ft.) upwards by a small propellant charge. Approximately a half-second later, the main charge detonates at the optimum height to kill or severely injure anyone in the immediate area. The main charge of the mine is surrounded by roughly 360 steel balls, short steel rods, or scrap metal pieces. These become metal shrapnel that sprays horizontally from the mine at high velocity. The time between triggering and ignition of the propelling charge varies between 3.9 and 4.5 seconds, depending on the age and condition of the mine. According to German documentation, the S-mine is lethal within 20 yards and can inflict casualties within 100 yards. US Army records indicate casualties can occur at up to 150 yards.

It is a common misconception that the S-mine will not detonate until its victim steps off the trigger. NOT TRUE! The mine will detonate whether the trigger is released or not. Standing still or attempting to run from the S-mine is equally dangerous. The most effective way to survive the mine's detonation is not to flee but to fall to the ground lying face down as quickly as possible.
Once an S-mine is discovered, disarming it is fairly simple. To prevent triggering while the mine is being planted, the German pressure sensor features a hole where a safety pin keeps the sensor from being depressed. This pin was removed once the mine was planted. If the discovered mine is fitted with the pressure sensor, the disarming personnel can slip a pin (such as a sewing needle or pin) into this hole. If the device is armed with a tripwire or electrical trigger, this can simply be cut. Germans are known to use booby traps to discourage this, so BE CAREFUL! The mine can then be removed carefully from the ground and the sensor easily unscrewed. If it is necessary to render the mine completely inert, three plugs on the top provide access to the three detonators inside the mine. These plugs can be unscrewed and the detonators removed.
**Teller Mine:**
The German Teller ("Plate") Mine pattern 43 is the standard German anti-tank mine. It is a circular, plate-shaped device with a built-in carrying handle.

The Model 43 "Mushroom" is a simplified version of the Model 42. The Model 43 detonates when a protruding pin is forced into the mine due to the pressure of a tank or other heavy object impacting on the upper surface of the mine.

The mine has secondary fuze wells located on the side and base to enable anti-handling devices to be fitted if required. Additionally, the T.Mi.Z.43 fuze features an integral anti-handling device as standard: when the fuze is inserted and the pressure plate screwed down into place, it shears a weak arming pin in the fuze with an audible "snap". This action arms the anti-handling device. Thereafter, any attempt to disarm the mine by unscrewing the pressure plate (to remove the fuze) will automatically trigger detonation. Since it is impossible to determine which fuze type has been installed, no pressure plate should be removed from a Teller mine. It is best not to try to disarm these mines. Mark them and go on.
Summary

This concludes our class on barrier breaching. Mines and barbed wire may not have a major role in reenactments, but they did in World War II. Keep this material in mind. Remember it for future exercises and living history presentations.

This concludes our class on barrier breaching. Any questions?

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