

Smoke Generators

—through the years

By SSG Gene Weinreis

Smoke—more important today than ever before! Will we be able to fight and win on the Airland Battlefield covered with the puffy white layers of smoke that can and will save lives?

During World War II, armies moved to and across

battlefields and continued their work under cover of an artificial mechanical fog—something never-before ex-

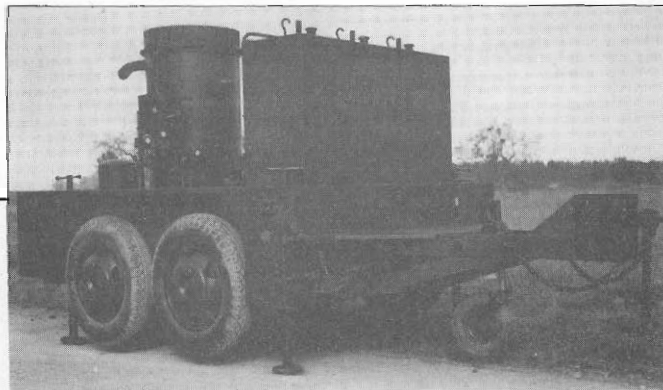
perienced by troops during combat. American troops in the Pacific were protected from Japanese bullets by

screens of white smoke. In Europe, hitting the beach-heads, roadways, and river crossings, our troops were protected by the artificial smoke that helped hide their movements. From the smoke munitions developed in World War I evolved the screening devices used in WWII.

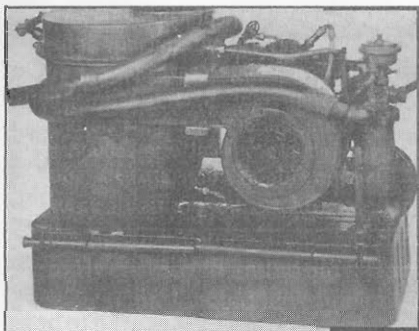
Smoke pots play a vital role in quick small-area smoke screens. The major problem using smoke produced by the combustion of chemical mixtures is its harmful effects on personnel. (The M4A2 and M5 smoke pots are harmful to troops within a 30-meter area. They should wear their protective masks and cover exposed skin.)

Smoke from HC-filled smoke pots is seldom effective farther than between 500 to 800 meters, but, smoke from mechanical smoke generators can extend possibly for several miles.

The National Defense Research Committee, with cooperation from the



The M1 smoke generator (inset and below) weighed 3,000 pounds empty and 5,400 pounds filled.

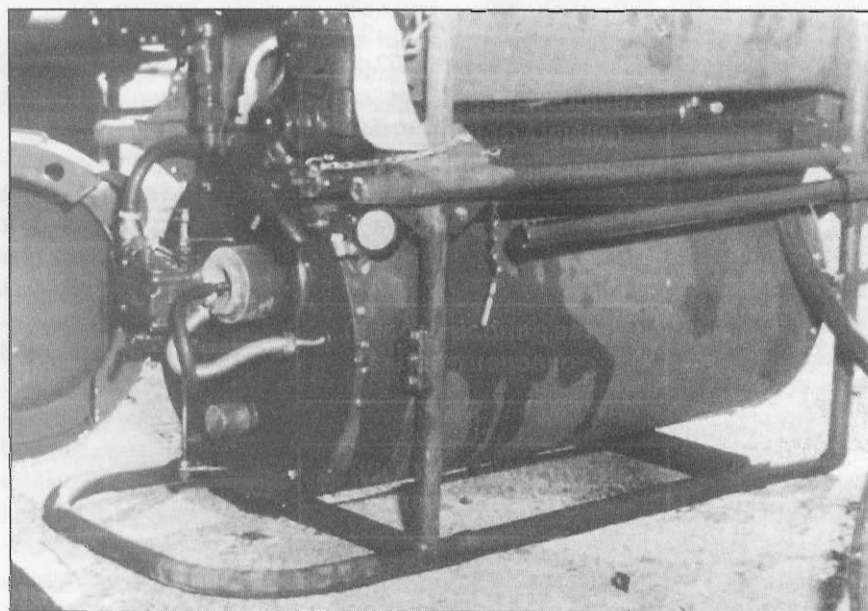


cooperation from the Chemical Warfare Service, helped develop the first mechanical smoke generator in 1942. This first generator worked on a simple principle. The generator vaporized a mixture of fog oil and water and then discharged the mixed vapors into the air. When the hot vapor hit the cool air, it condensed back into tiny liquid droplets.

The M1 smoke generator (page 24) stood six feet tall and weighed 3,000 pounds empty and 5,400 pounds filled. Because of its weight, it had to be transported by a truck, trailer, or on a barge. Working at full capacity, it consumed 7 gallons of fuel, 100 gallons of fog oil, and 150 gallons of water per hour. After starting, it took three to six minutes to warm up before it discharged an effective smoke screen.

One night years ago I happened to be driving one night in Duluth, Minnesota, during a heavy fog. With the highway all but obscured, I focused my vision on the center line. The line abruptly curved left and so did I. Had I gone straight, I would have gone over the edge of the road and dropped into a tree- and brush-covered ravine hundreds of feet down. That night fog nearly claimed another victim.

With practice comes experience, and whether you drive in fog on a highway or in smoke on field maneuvers, such experience may one day save your life. This is what training the force is all about.

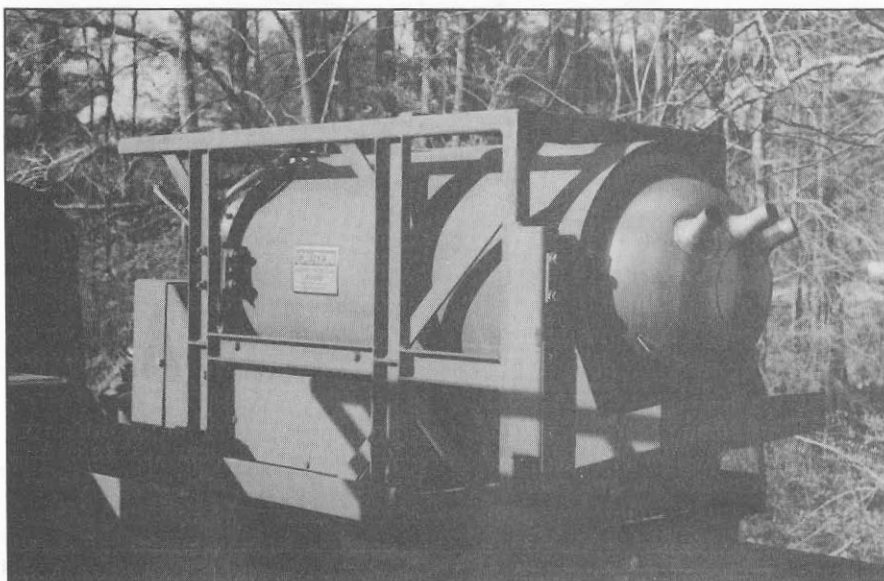


The M2 smoke generator (top), used in World War II, and the M3A4 (above), still in use today.

Smoke generators were first used in North Africa and for the invasion of Sicily. In the Salerno bay area, generator units operated for the first time under artillery fire, able to conceal the unloading areas from the German troops. Commanders saw the effectiveness of smoke and decided to include a smoke unit in the Anzio landing in Italy. During the landing, mechanical generators threw up a protective haze that covered the area

between the town of Anzio and the enemy lines. Henceforth, the Army employed smoke generators in front area operations such as convoy and troop movements.

Soldiers going ashore at Anzio sometimes did not realize that smoke was being used. Lieutenant Raymond C. Stillger, who landed with the 34th Infantry Division three days after the daylight screening began, thought that the haze was a result of either a natural



The M54 smoke system, which can be mounted on an M113 or a HMMWV.

the battlefield.

General Truscott commented on the effectiveness of the smoke, which was used extensively to limit German observations and reduce the effectiveness of their artillery fires. German sources, after the war, testified to the effectiveness of the 'well-prepared and conducted' screening operations at Anzio which obstructed observation and interfered with defensive and direct fire.

The M1 smoke generator proved to be too cumbersome and inefficient. The length of time needed to warm up sometimes delayed the rapid deployment of troops. On occasions, because of its weight, the M1 was hard to move about on the battlefield. The Chemical Warfare Service and the National Defense Research Committee intensified their efforts to produce a lighter, compact generator that could be moved and operated easily.

In January 1944, the Chemical Warfare Service standardized the Besler generator and designated it the M2. The M2 smoke generator stood 2 feet tall by 2 feet wide and was less than 3 feet long. It consumed 5 gallons of fuel, 5 gallons of water, and 50 gallons of fog oil per hour. Its dry weight was

172 pounds. This light generator could be carried by two men, making it easier to deploy just about anywhere.

The major advantages of this generator was that it could be deployed in mountainous areas on soft ground. It could produce smoke in less than one minute in contrast to the M1 that needed three to six minutes. This generator was much easier to operate and maintain, compared to the M1.

On the eve of the Normandy Invasion, the First US Army received their M2s; in August 1944, the Fifth US Army in Italy received their first M2s as well. These generators, however, didn't perform to expectations. They were able to produce smoke for a few days, and then stopped. The oil-water mixture in the generator was heated up by coils to make the smoke. These coils kept burning out. Poorly trained, careless operators caused some of these breakdowns and faulty design caused others to surface. Today we cure this problem with good maintenance and training.

Engineers at Edgewood Arsenal corrected minor faults, but by the war's end they were still working on the solution to prevent coil burnouts.

The mechanical smoke generator

added a new dimension to smoke operations in World War II. On today's Airland battlefield, smoke will be standard equipment. The standard equipment used today is the M3A4 and the M54. In order to move, fight, and win on the battlefield, the M1059 and M1037 will help to put smoke on the battlefield. In training the force concept, our training is geared to be as realistic as possible. Our being able to move in smoke will increase our chances to survive.

The M3A4 smoke generator consumes 3 gallons of fuel and averages 50 gallons of fog oil per hour. It weighs 180 pounds. This generator was introduced in 1985 and is still in use today.

The M54 smoke generator uses 3 gallons of fuel and about 40 gallons of fog oil per hour. This generator weighs 175 pounds and is mounted two each per M113 tracked vehicle or the HMMWV, M998.

References:

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At the time this article was written, SSG Gene Weinreis was assigned to the NCO Academy at Fort McClellan, Alabama, as a small group leader. SSG Weinreis' previous assignments include Technical Training Department, Department of Training, USACMLS; HHC, 197th Ordnance Battalion; 59th Ordnance Brigade, West Germany; and Company C, 34th Support Battalion, 6th Air Cavalry Combat Brigade, Fort Hood, Texas. SSG Weinreis has an associate degree in law enforcement. He is a graduate of both the chemical non-commissioned officer basic and advanced courses.