COMPARISON OF GERMAN MACHINE GUNS

The following comparison and photographs of the German machine-gun model 34, 34 (modified), 34S, 34/41 and 42 are based on data received from the Aberdeen Proving Grounds.

The MG 34 is a familiar weapon, and model 42 has already been described in Tactical and Technical Trends no. 20, p. 28 and no. 31, p. 37. This report is of interest because of its comparison of the variations of model 34 and the excellence of the detail of the illustrations.

* * *

a. MG 34 Modified

The MG 34 (modified) is used principally in armored vehicle hull mounts and differs from the MG 34 in the following:

(1) Heavier barrel jacket adapted to fit in ball type hull mounts
(2) Absence of antiaircraft sight bracket
(3) Simplified and easily operated firing pin nut lock
(4) Bipod clamps for attaching bipod for emergency use.

This model can be mounted on the antiaircraft and heavy ground mounts.

b. MG 34S and 34/41

The MG 34S and MG 34/41, are identical in appearance except for the perforated operating handle of the MG 34/41 (see figure 2) but are named in this report separately only because a definite effort was made to make them as distinct models. The reason for this is unknown. One description will suffice for both weapons. They differ from the MG 34 in the following:

(1) Provision for full automatic fire only instead of full or semiautomatic fire;
(2) Simplified trigger group with extensive use of stampings;
(3) Barrel 3 1/2 shorter with enlarged muzzle end to accelerate recoil;
(4) Simplified bolt and bolt-locking sleeve eliminating many machining operations;
(5) Elimination of firing pin lock nut and substitution of a simple, easily operated, plunger type, catch recessed in the bolt carrier;
(6) Larger and stronger ejector assembly located in the left receiver wall;
(7) Larger and stronger buffer group;
(8) Heavier recoil spring constructed of two lengths of woven wire;
(9) Addition of a cocking lever catch to secure cocking lever in the forward position;
(10) Modified feed mechanism providing a more secure trip on the cartridge.

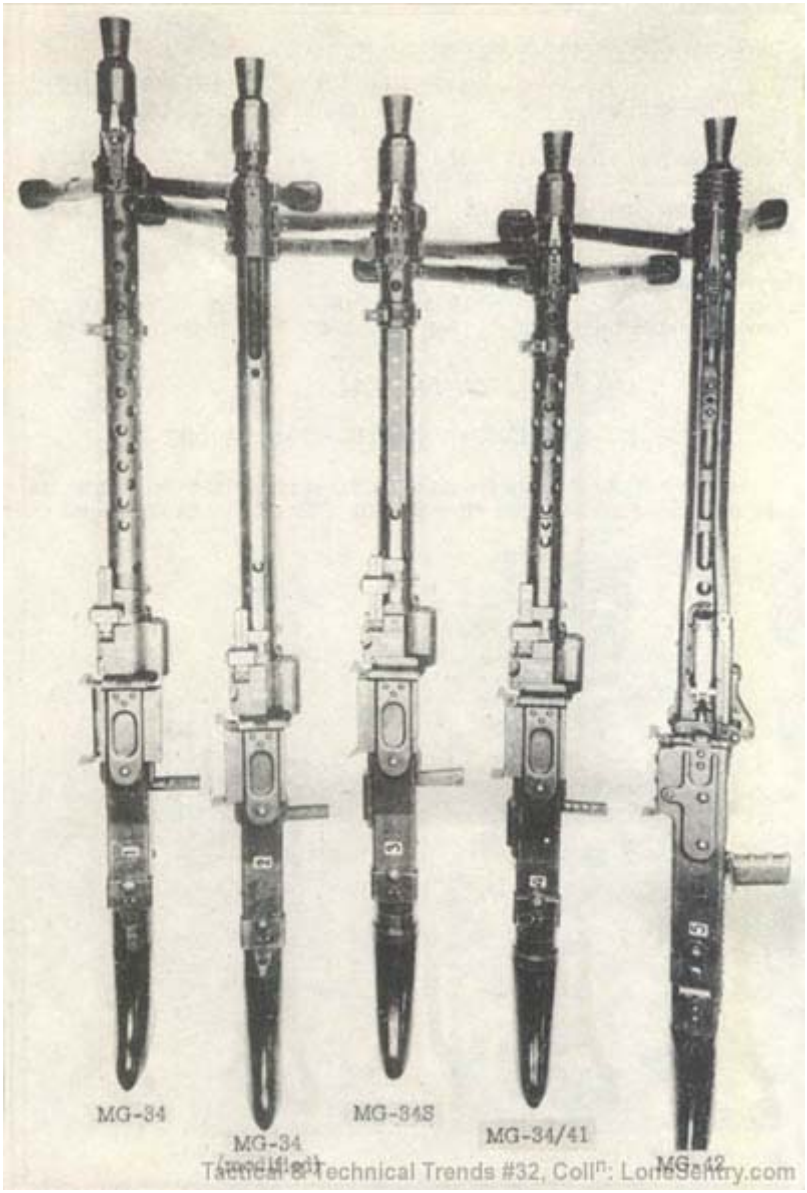
Both models can be used on the antiaircraft mount and although they appear to have been designed for mounting on the heavy ground mount, the clamp, fitting over the rear end of the barrel jacket cannot be secured when the gun is in place. A different trigger actuator is also required. The MG 34 and the models described above may be mounted flexibly in tank hulls.

c. MG 42

The MG 42 is a new design but has the same tactical employment. A few of the outstanding characteristics will be listed here. The MG 42 differs from the MG 34 basically in the following:

(1) Extensive use of stampings in receiver, barrel jacket, cover assembly, and trigger group;
(2) Provision for full automatic fire only;
(3) Simplified bolt assembly allowing rollers to lock bolt to locking sleeve and eliminating locking lugs. The bolt carrier is a forging;
(4) Simplified buffer mechanism with a very heavy spring;
(5) A new and simplified quick change barrel is provided;
(6) A more flexible feed mechanism is provided making for smoother operation.

Bipod, antiaircraft and heavy ground mount are provided but these mounts are not interchangeable with those used with the MG 34.



d. Tables of Weights and Measurements:

Characteristic	MG 34	MG 34 (Modified)	MG 34S MG 34/41	MG 42
Weight w/o bipod (pounds)	24 1/2	26 3/4	24 1/4	23 1/4
Weight of barrel (pounds)	4 3/8	4 3/8	3 3/4	3 7/8
Weight of bolt (pounds)	1 1/16	1 1/16	1 5/16	1 1/16
Overall length (inches)	48	48	44 1/4	48
Length of barrel (inches)	23 1/2	23 1/2	19 3/4	21
Free length of recoil spring (inches)	18	18	22	15 1/2
Year of manufacture	1941	1942	1942	1942

GERMAN AND ITALIAN INDIVIDUAL ANTIGAS EQUIPMENT

The following information briefly outlines the antigas equipment carried by the individual German and Italian soldier; it is based on the most recent information available.

a. German Army

(1) Gas Mask

The gas mask is always on the soldier's person, both in active theaters of war and elsewhere. German regulations give clear instructions to this effect. There has been some evidence that German soldiers in occupied countries only carry them when on duty. Recent information, however, indicates that German soldiers in Paris always carry gas masks.

(2) Personal Decontaminant

This consists of a box containing 10 tablets of Losantin carried by every soldier in the pocket of his uniform.

Losantin tablets are stabilized bleach, with an available chlorine content of 39.8 percent. They are used for treating skin contaminated with a vesicant. A tablet is made into paste with water or saliva which is then applied to the affected part; after 10 minutes it is washed or wiped off. The example of the incautious experimenter who ate several tablets under the impression that he was eating "[German] food tablets" should NOT be followed.

(3) Antigas Sheet

The so-called antigas sheet it is carried in all operational theaters by every soldier in a satchel slung on the chest. These sheets, about 6 by 4 feet, are made of a rubberized fabric. They are designed primarily for protection of the person in surprise attacks with liquid vesicants.

b. Italian Army

(1) Gas Mask

The gas mask is always carried on the man.

(2) Personal Decontaminant

An "antivesicant packet" is carried by every soldier. It contains absorbent pads which are saturated with carbon tetrachloride from an ampoule which has to be broken. The contamination is then dabbed off with the moistened pad.

(3) Antigas Sheet

There has been no reference in any Italian manuals or orders to the existence of an antigas sheet, and none have been reported as having been captured. It is presumed that none have been introduced.

GERMAN HEALTH PAMPHLET FOR NORTH AFRICA

The German pamphlet translated below contains information on general health precautions, which are not only of interest and value in themselves, but also because of their close similarity to official U.S. Army medical instruction and principles of sanitation. While the pamphlet has reference to the North African area, much of it is applicable to all areas and is therefore of general interest.

The pamphlet was issued by the office of the German Army Surgeon General and is dated 1942. As is apparent from the context, it is intended for the individual soldier. Instructions accompanying the pamphlet state that it is to be carried in the inside flap of the paybook.*

The translation of the pamphlet follows:

* * *

The climate of the country is quite different from that of your homeland. The days in summer are hot and sunny, in winter, warm; the nights, on the other hand, are cool in summer, in winter, very cold. Throughout the entire country, water is very scarce. The German soldier must, first of all, accustom himself to the climatic peculiarities. The population of the country has different customs, ways of living, and practices, than our people. They have a different religion. Do not disregard all this in association with the people of the country. You will get on much easier. There are illnesses there which we do not have in Germany. You must, therefore, know the dangers which threaten you in this particular country.

Observe the following:

(1) Water

The virus of many different kinds of diseases can come from the water of this country. Therefore, never drink unboiled water, also do not rinse out your mouth with it, as long as your superior officers do not designate the water pure! Boil your water! It is best to drink tea or coffee and use the portable filter apparatus. It makes all fresh water potable!** Drink no mineral water and no lemonade as long as it has not been expressly designated as harmless by your superior. Ice in restaurants and ice-cooled drinks, which are offered for sale on the streets, are not prepared under sanitary conditions and, therefore, are harmful to your health; avoid them, even if you are extremely thirsty. Do not wash yourself in dirty water, do not bathe in streams, lakes, ponds, pools. Bathing in the sea is permitted. Do not bathe when in an overheated condition.

(2) Nutrition

You will receive the best food from your unit. Do not eat raw meat. Never drink unboiled milk, especially not goatmilk! Wash all fruit in purified water or peel it before eating. Do not buy quarters or halves of melons when they are offered by street merchants. Buy only whole, uncut melons. Do not pick up any food from the ground, especially meat, fish, and sausage; in the heat, foodstuffs perish quickly and contaminate! Protect your rations from flies. They carry disease.

(3) Dress

Always wear a stomach band.*** You protect yourself against catching cold. Always wear your sun helmet out of doors during the heat of the day. Otherwise, wear your field cap. It serves no purpose and is harmful to the health to run about in warm countries with the upper part of the body naked. It is a mistake to believe that one is cooled off in that manner. When the air-temperature is greater than 38 degrees Centigrade [100 degrees Fahrenheit] the wind has a heating effect on the skin.

(4) Bivouac

Avoid particularly the dwellings of natives. Before you take up quarters in houses or barracks, clean the area thoroughly. Excrement and refuse are the breeding places of flies, and these carry to food-stuffs or direct to people the germs of dangerous illnesses (especially dysentery). Therefore, latrines must be free from flies. The trench-latrine serves the purpose.

(5) Vermin

Besides flies there are body lice, ticks, mosquitoes, snakes, and scorpions in this country. Mosquitoes are carriers of fevers, and malaria. Combat the mosquitoes in the morning and in the evening in your barracks by continuously killing them. If you burn a light in your barracks, keep the windows closed when possible; mosquitoes are attracted by burning lights. Use your mosquito net when you go to bed. Be careful, however, that when you lie under your mosquito net that there are no mosquitoes in the net and that the net is carefully tucked in under the bed and no openings are left for mosquitoes to enter.

If you have body lice, report it immediately: body lice and ticks carry spotted fever and relapsing fever, and both are serious illnesses. The snakes in this country are poisonous. They hide themselves in the sand. Scorpions are often found under loose rocks. Therefore, do not run about with bare feet and naked legs. Inspect your sleeping-bag daily for snakes and scorpions. Shake out your boots before putting them on. They are a favorite hiding-place for scorpions. It is frequently maintained that a drink of liquor is beneficial after you have suffered a snake bite. This is foolishness. Alcohol, under such circumstances, is harmful. If you should be bitten by a snake, apply a tourniquet directly above the wound on the side toward the heart. The pressure applied to the tourniquet should not be great enough to cause the wounded part to swell and turn blue. With a disinfected razor blade, make a cross-like incision at the wound. Each cut should be at most about 1 inch long and not deeper than 1/2 inch. Allow the wound to bleed for 3 minutes; sucking the poison from the open wound is frequently recommended. This should be undertaken only by one who has no open sores or cavities in his mouth. With the blunt side of the disinfected razor blade, rub several potassium permanganate crystals into the wound; bind the wound and remove the tourniquet. Then report to the unit surgeon or medical officer immediately.

(6) Venereal Diseases

Women who solicit freely are usually infected. You should visit those houses only which are approved by the military authorities. Always use a condom. Follow orders, and take a prophylaxis after having exposed yourself.

(7) Concerning Animals

Dogs and cats are frequently carriers of diseases, e.g., rabies, serious worm and blood diseases. Do not handle dogs, cats, or monkeys.

(8) Vaccinations

The vaccinations prescribed by the military authorities protect you from serious diseases. The unvaccinated person not only endangers himself, but the lives of his comrades as well!

(9) Prevention of Malaria

Do not hesitate to take tablets to prevent malaria, when they must be taken! You do not know the danger to which you and your comrades are exposed.

(10) Skin Irritation ("Red Dog")

"Red dog" (roter Hund) is an annoying skin irritation, which is caused by excessive heat and attended by extreme perspiration. Frequent bathing in warm water and lathering with medicinal soap (when available) is the best protection. If you have "red dog," lather yourself with medicinal soap, and allow the lather to remain on your skin for 15 minutes. Blot yourself dry--do not rub. Dry yourself especially carefully in those parts where the conformation of the body causes skin wrinkles and between the toes.

(11) Slight Injuries

If you receive a slight wound on the calf of your leg from a thorn, or from striking against a sharp rock or from insect stings, apply a sterile bandage. If you allow such apparently trivial wounds to go unattended, they can develop into annoying and slowly healing sores.

*The paybook is carried by all German soldiers and is often found on German prisoners; aside from containing the pay record of the individual, the paybook also includes the soldier's unit, although it may not be up-to-date in this respect, and such miscellaneous personal data as gas mask size, blood type, etc.
**If this statement is correct, the filter probably includes an element to chlorinate the filtered water.
***Stomach bands are not believed to serve any useful purpose and are not recommended by the U.S. Army Medical Corps.

GERMAN METHODS OF CAMOUFLAGE

Modern methods of air operations--including developments in aerial photography--have enormously increased the importance of camouflage.

In the last war the air was used more for reconnaissance than for bombing, and consequently troop movements were more important to conceal than factories and airdromes. It has needed the intense bombing attacks of this war to develop the art of concealing large structures such as railway stations and hangars.

The Germans have evidently studied the problem very closely, and with their usual thoroughness have resorted to elaborate schemes of concealment and deception wherever they consider such measures justified by the importance of the target. Thus it is now becoming the rule rather than the exception to see landing fields and airdromes presenting from the air the most convincing impressions of woods, roads, ditches, hedges and cultivation patches. Brown, light green, and yellow substances are sprayed over the ground to give the effect of plough or vegetation. Dummy farms and other buildings are disposed around airdromes to conceal workshops or isolated aircraft outside their hangars, while papier-mache cows and beds of real flowers are used to add a convincing note. Dummy cottages are erected or painted on the tops of hangars, the vertical sides of which are sloped off by a lattice of steel wires garnished with green-dyed jute, sometimes shaped possibly to resemble trees. Great attention is always paid to changing the color of the garnishing by spraying so as to correspond with the changing colors of the seasons.

It is well known that Berlin has been extensively camouflaged, not only the city itself but also the outskirts. One example is the most important distinguishing landmark in Berlin, namely the wide avenue running east and west through the city and called the "Axis." The pavement of this avenue has been sprayed with a dark green paint to blend with the trees in the Tiergarten (a large park), along the avenue and throughout the western section of the city. The Victory Monument (Siegesäule), in the center of a circle on the Axis, has been painted with a dull color so as not to reflect light. An overhead cover of wire matting, interwoven with green materials to resemble vegetation, covers the avenue for a considerable distance. The wire netting is about 18 feet high and is interspersed with artificial shrubs and trees. About every 30 yards the coloring and texture of the greenery has been changed. To eliminate shadows, netting has also been hung from the sides at an angle of about 20 degrees.

To create an opposite effect namely to simulate a street where in fact there is none, wire netting has also been used. These dummy streets are frequently connected with the real ones which then disappear into artificial woods. In one instance it is reported that a "woods" was created by fastening artificial sprigs about 1 foot high and about 1 to 2 inches apart to a wire net. Through these "woods" a system of "roads" was painted in brown on the mesh of the net.

In Berlin many important buildings have been camouflaged by covering them with nets, and by placing artificial barns, farm buildings, and trees on the roofs.

It has also been reported that dummy installations on a very large scale have been erected at a distance of about 40 kilometers from the center of Berlin in an area about 400 kilometers square. These dummies include not only structures simulating railway stations, etc., but also installations to give the effect of city lights, and for causing fires to give the impression of effective bombing.

The principal railway station at Hamburg had a complete false roof built over it in the shape of a small hill. This false roof was completely covered with material resembling green grass, and artificial paths were made over the "hill". A hangar at Rheine in Northwest Germany had no other form of camouflage than two dark patches painted on top of the northern edge. These patches combined with the shadow to break up the regular shape of hangar and shadow together. Painted disruptive camouflage of this type is very simple, and surprisingly effective when viewed under favorable lighting conditions.

Camouflage of a landing-field surface is begun at the earliest possible moment, even when extensive construction work is still going on. A good example of this is at Laval, south of Cherbourg, where the excellent camouflage of that area of the landing ground which is now finished could only have been carried out under considerable difficulty, in view of all the other levelling and drainage work involved.

Water is recognized as an easily distinguishable landmark, and lakes and canals in important industrial areas are covered by rafts and netting, painted to blend with the surroundings.

The importance of avoiding regular outline is appreciated, and applied not only to the breaking up of the form of large buildings, but also to the parking of motor transport.

Though considerable effort is apparently devoted to training the individual soldier to camouflage himself by the use of whatever material he may find, comparatively little information has come in concerning the methods adopted by German troops in European campaigns. There are two reasons for this: first, they have almost always been on the offensive, so that the necessity of constructing and concealing defensive positions has not arisen very frequently; and second, they have, at least until recently, enjoyed air superiority, so that the need of concealing themselves from air observation has hardly been felt.

Considerable ingenuity was shown in Poland and France in concealing minefields and artillery, but disruptive painting of motor transport and armored vehicles was apparently little practiced. The use of dummy positions appears to have been very common. Field guns were concealed in dummy haystacks, antitank guns and limbers were disguised as carts and even driven by soldiers disguised as civilians. On the other hand parachutes with straw dummies attached and canisters with bogus instructions were dropped to create alarm. There appears, in fact, to have been a frequent offensive use of camouflage to enable all kinds of ruses to be carried out.

German practice in Libya was affected by lack of unchallenged air superiority and by the fact that they have had to engage in positional warfare. Much ingenuity in concealing weapons, war materials, and minefields has been shown, aided very frequently by the favorite German method of using dummies.

In the desert more attention has had to be devoted to concealment from the air, which has been achieved in two ways. Either vehicles and war material are camouflaged with nets or local material, or else resort is had to wide dispersion. At first dispersion was bad owing to lack of training, but lessons have been quickly learned and dispersion is now generally excellent. The use of dummies is very frequent and popular.

In Section II of this publication, the report of the encirclement of Kiev mentions the use of this stratagem and its importance in the tactics adopted. Here, it is to be observed that dummies simulating boats and bridging equipment were constructed by the Germans in the crossing of the Dnieper in order to deceive the Russian observers as to the area chosen for the initial crossing.

Near Capuzzo in July 1941 guns were located among abandoned Italian artillery which had been left there from previous battles. These guns were not noticed until they opened fire. It is reported that at Derna planes destroyed in previous fighting had been recovered and placed on the airdrome as dummy targets. Dummy motor transport parks and coast defense guns had been constructed. A minefield was recently camouflaged by tracks made with a spare wheel between the mines, and a British armored car was lured into it. In an Italian sector a post was found manned with straw-filled dummies in German uniforms stripped from corpses.

Most important is the use of dummy tanks. According to a prisoner these are cardboard structures built over a motorcycle, but a photograph has been captured showing one mounted on a light Volkswagen. Probably both are used. They are, of course used only at a distance, and their purpose is to draw fire, to confuse the enemy as to the probable point of attack, to conceal the fact that a real tank unit has moved, or to give an exaggerated idea of tank strength.

Disruptive painting of guns, vehicles, motor transport, and tents is apparently not very much used. There has been a report that both motor transport and tanks are painted light khaki and sometimes smeared with grease and sand. There have, however, been reports of armored cars painted dark green with yellow turrets. This, however, may have been some form of unit marking. Tents are reported to be the standard dark green color. Guns are painted yellow; the only concealment is provided by their sun-covers. Nets have recently been reported in use by the Germans, stretched over vehicles, and either pegged down or else extended outwards on poles. These nets are garnished with small bushes, and the like. A net or screen has also been used to disguise the presence of armored cars lying in ambush. Food and fuel dumps are concealed in pits about 18 inches deep, which are dug well away from any landmark, are well dispersed, and covered with nets and brushwood.

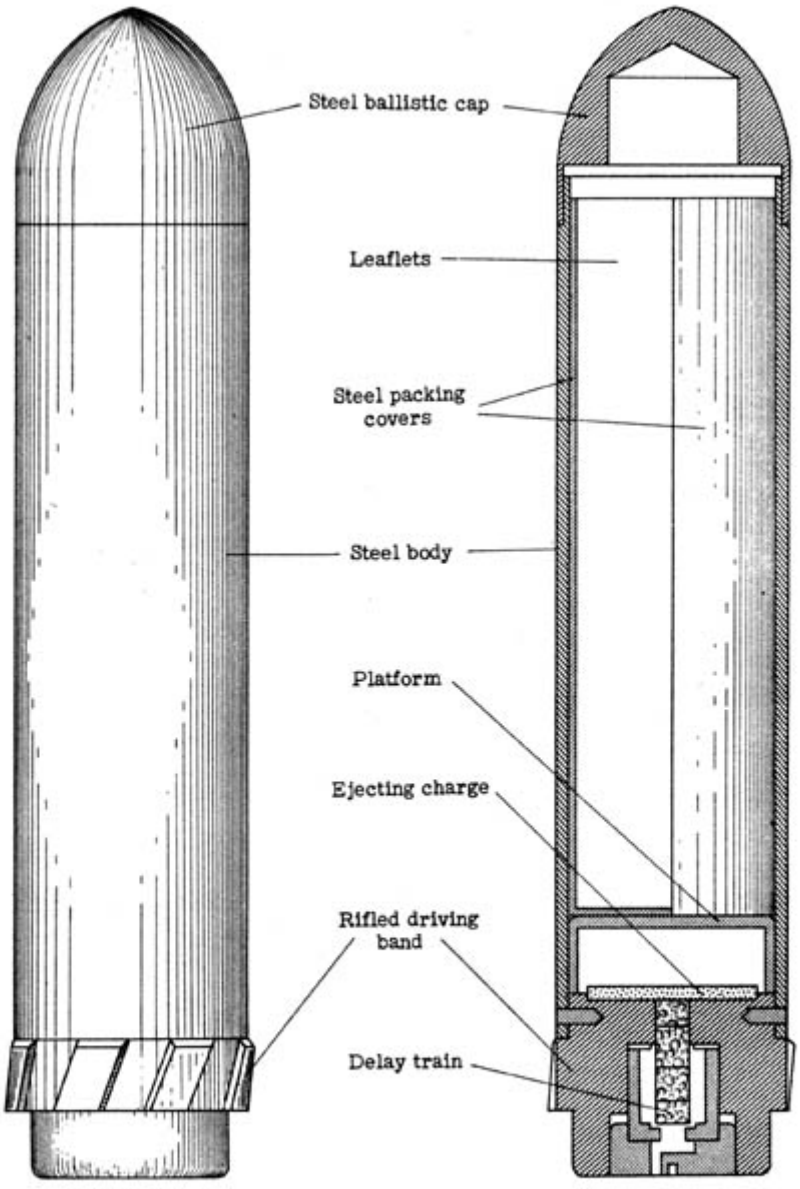
A recent report mentions a large gasoline dump camouflaged by a net or screen, behind which an enemy patrol, consisting, it is thought, of three trucks mounting guns, lay concealed. When the gasoline was fired on, the screen disappeared and fire was returned.

A report written by the commanding officer of a German infantry battalion throws interesting light on the difficulties caused by excessive orderliness of mind and lack of practice in individual concealment. He complains of the necessity of combating the herd instinct--"Not only man and beast fall victim to it, tents and vehicles do so also". He enlarges at considerable length on both the bunching and symmetrical dispersal of tents and motor transport, practices to which the Germans are addicted. He also gives careful instructions on the construction of narrow and deep trenches, which must have no parapet and must be covered over, citing British positions as examples to be imitated.

GERMAN PROPAGANDA RIFLE GRENADE

For the purpose of distributing propaganda leaflets among enemy front-line troops with whom they are closely engaged, the Germans have in use a propaganda rifle grenade (Gewehr Propaganda Granate).

This grenade is similar in appearance to the Germans' small hollow-charge grenade. It is fired from the normal cup launcher. The grenade sight, however, is not used. Range is reported to be approximately 500 yards.



GERMAN PROPAGANDA RIFLE GRENADE

The propaganda rifle grenade is about 5 1/2 inches in length. It consists of a steel case with a rifling pre-engraved on the base and containing a delay fuze and a small ejecting charge, a removable cap and two covers for the leaflets. The propelling charge, Gewehr-Kartusche Für Gewehr-Propaganda-Granate

(rifle cartridge for rifle propaganda grenade) is distinguished from other propelling charges by a red band painted on the cartridge case. The weight, filled with leaflets, is 8 ounces.

The grenades are packed 40 to a box with 41 propelling cartridges and a supply of leaflets. They are, not issued generally to troops but are handled by the sector propaganda officer.

GERMAN SALVAGE PROCEDURE IN THE DESERT

It has been stated that Marshal Rommel, in planning his campaigns, puts great emphasis on the capture of British equipment and supplies, and that the acquisition of large quantities of such booty has been one of the important factors in the success of his past operations in North Africa.

The importance of captured materiel in the German supply system is illustrated by a field order issued by Rommel on May 23, 3 days before the start of the German spring offensive. The order states: "The shortage of raw material and supplies in Africa makes it necessary to take every opportunity of seizing enemy equipment and supplies. Units may take with them only such amount of captured materiel as will not impair their operational readiness; all other booty will be dealt with by a special Salvage Section (Beuteberge-Abteilung) of Panzer Army Headquarters.

"A guard is to be left over all dumps and stocks. The Salvage Section will make arrangements for the security and removal of all dumps and will provide technical personnel and transport. It is to be in direct communication with the forward troops. Captured supplies are to be marked in light blue paint with the words 'Tedesco' (Italian word for German) and 'Erfasste Beute' (captured booty). Strong disciplinary action is to be taken in the event of any misuse or destruction of salvage."

On several occasions during the course of the offensive, it was observed that, at the conclusion of an engagement, enemy salvage parties appeared on the battlefield and began recovery of transport and antitank guns before the evacuation of prisoners of war had been completed.

On the other hand, the Germans are equally thorough in measures taken to prevent their own materiel from falling in serviceable condition into British hands. For example, German vehicles used in the desert are equipped with demolition or incendiary bombs, and drivers are instructed to destroy their vehicles prior to capture. Similarly in a recent visit to the El Alamein battlefield, it was noted that captured Axis tanks, motor vehicles, artillery, and anti-tank guns in large numbers had been destroyed prior to capture.

GERMAN TELLERMINES

Land mines are not a new development, but their use in astronomical numbers, as in recent campaigns, is new to this war. The mine is normally associated with war at sea. But the pre-eminence of the tank, or "land battleship," in battles on land has emphasized the importance of the land mine and made its use mandatory around any well-defended position. Among the most widely used antitank mines is the German Tellermine. The four known models of this mine are described below.

a. Tellermine No. 1

The 1935 model or Tellermine No. 1 is circular in plan with a diameter of 12 3/4 inches. It has a convex top, a flat bottom, and a maximum height of 3 1/4 inches. The total weight of the mine is 19 1/4 pounds. In a fully armed condition the mine is equipped with a main pressure igniter in the center of the top cover, and one or two standard pull igniters in its base as secondary firing devices. The principal features of this mine are shown in the accompanying sketches (figure 1). The body of the mine is a circular metal box (1) with a dome-shaped top surface containing 11 pounds of high-grade pressed TNT. A "floating" cover (2) is held down by a heavy metal ring (3) attached to the body and is supported in the center by a heavy spring (4). The spring fits into and bears on a metal fitting (5) which fits into the top of the body. The fitting also acts as a receiver for the detonator (6). Directly above the detonator are the two metal collars (7) and (8) (which screw into a recess in the fitting), a compressible rubber ring (9), and the igniter (10). The lower collar (7) is a retaining collar for the detonator; the upper collar (8) is an adjusting or positioning collar for the igniter. The compressible rubber ring serves as a cushioned seat for the bottom of the igniter. The upper collar is screwed into the proper position in the fitting by means of a special tool. The small, headless set-screw (11) holds the collar (8) in position. The igniter is screwed into the mine cover (2) until it bears firmly on the rubber washer (12) and the rubber ring (9). The body of the mine has two receptacles (13) and (14), threaded to receive secondary firing devices. One receptacle is usually located in the side of the body opposite the handle, and the other in the bottom between the handle and the center of the mine. The mine has a metal carrying handle (15). A rubber strip (16) seals the junction between the cover and the body of the mine against the entry of water and dirt. The washer (12) seals the joint between the igniter and the cover.

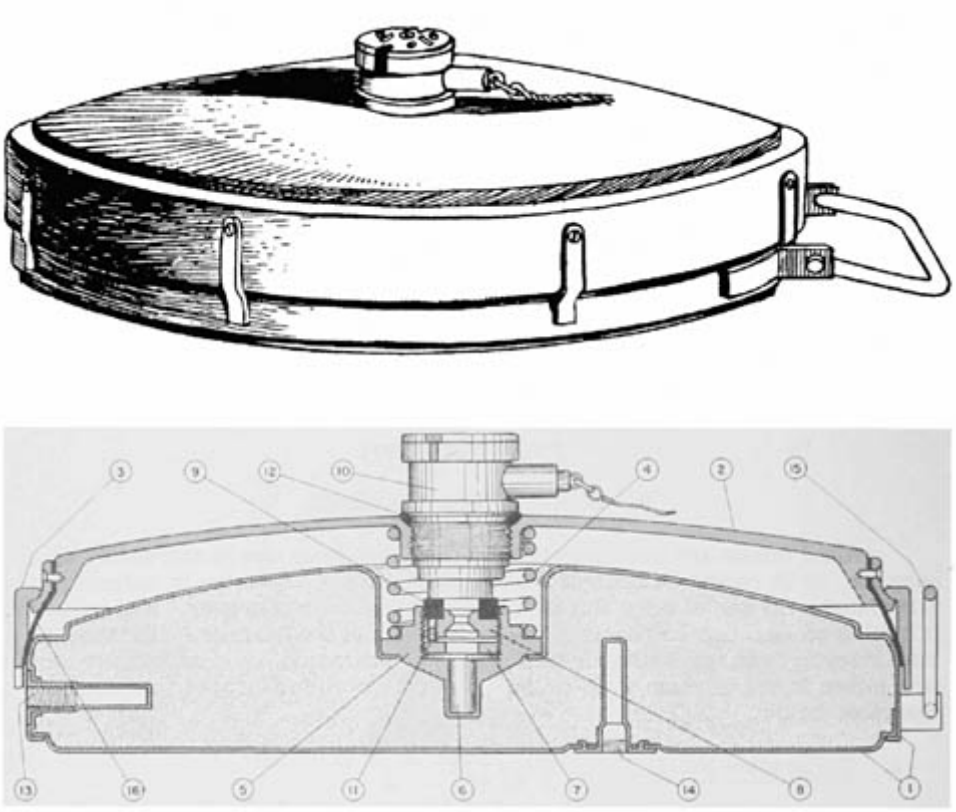


FIG. 1

b. Tellermine No. 2

This mine thought to be the 1942 model, is similar in size to the 1935 model or Tellermine No. 1. Its main dimensions are:

Maximum diameter (at base)	12.75 in
Maximum height	4.1 in
Diameter of pressure plate	5.7 in
Total weight of mine (filled)	19.3 lb
Weight of filling (TNT plus three penthrite detonating charges)	12.0 lb

The mine consists of a body (1) (see figure 2) fitted to a circular base plate (2). The base plate is turned over along its edge to make a press fit over the flange of the body as indicated at (3). A carrying handle (5) is attached by means of a T-strip (4) which is welded to the body.

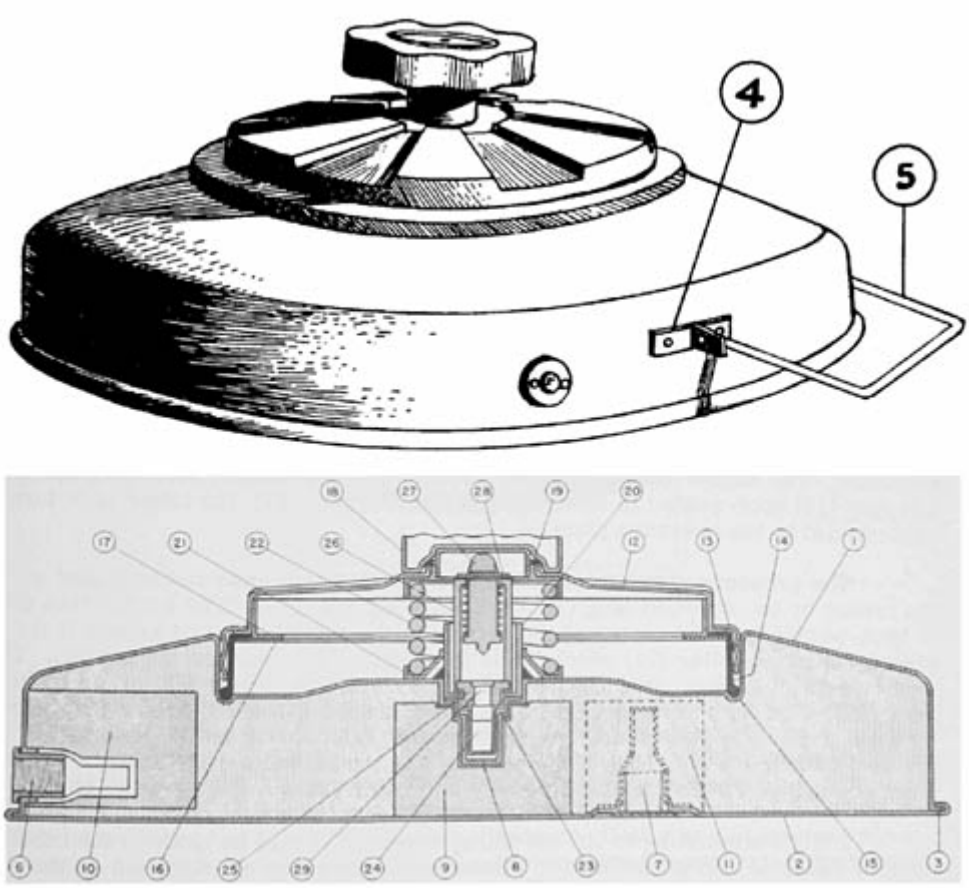


FIG. 2

The mine is fitted to take two additional igniters. One is located in the side of the mine 4 inches from the handle at (6), and the other is in the base of the mine at (7). The pocket or receptacle (8) for the main detonator protrudes into the mine filling, and is surrounded by a cylindrical penthrite detonating charge (9). Cylindrical penthrite detonating charges (10) and (11) also surround the screwed-in pockets for the additional igniters. The details of these detonating charges are as follows:

Detonating Charge at	Length	Diameter	Weight
(9)	1.6 in	2.38 in	0.36 lbs
(10)	2.3 in	1.6 in	0.25 lbs
(11)	1.6 in	1.6 in	0.11 lbs

The pocket or receptacle for the base igniter (7) is fastened to the circular base plate (2), its center being 2 1/4 inches from the center of the base plate. The base plate is pressed on and crimped to the circular body (1) without regard to maintaining a fixed position for the base igniter relative to the main igniter-detonator assembly. As a result, the base igniter may lie with its center at any point on the perimeter of a circle with a radius of 2 1/4 inches from the center of the base plate (i.e., also from the center of the main igniter-detonator assembly). This should always be borne in mind in searching for the position of the base igniter. The pressure plate (12) is held in the body by means of the collar (13), which is a spring fitted into the recess. The pressure plate has a rubber skirt (14) which fits into the depression (15), so that when assembled the operating mechanism under the pressure plate is protected from the entrance of dust and moisture. The rubber is held between the rim of the pressure plate (12) and the flat ring (16) spot-welded in several places to the ring (17); the latter is in turn spot-welded to the pressure plate.

The pressure plate is shaped to prevent local collapse and is closed at the center by the screwed plug (18) with a rubber seal (19). The igniter tube (20) is spot-welded into the center of the recess in the mine body, and around it is placed the loose collar (21) which holds in position the pressure spring (22). The screwed collar (23) secures the detonator (24) to the base plug (25) of the igniter body (26). The igniter mechanism consists of a spring-loaded striker (27) held by a shear pin (28). Pressure on the pressure plate, acting on the head of the striker, causes the shearing of the pin (28) and the release of the striker. This fires the cap (29) which in turn fires the detonator (24).

Before attempting to lift the mine, a search should be made around the edge of the mine and in the base to discover the presence of additional igniters. If any are found they should be neutralized and the attached wires cut. The screwed plug (18), when unscrewed, can be removed, thus revealing the igniter below. When the igniter is lifted out, the mine is disarmed since the detonator is attached to the igniter. The additional igniters should then be unscrewed, and the detonators below them removed.

c. Tellermine No. 3

A third type of German Tellermine has been reported (see figure 3). This mine is 12 1/2 inches in diameter, with a maximum height of 3 3/8 inches. It has a total weight of 21 pounds and is painted a matte gray. It has the following markings:

On the top, in white paint	T. Mi S31 Tvii. 2.42
On the top, in black paint	S 88 12 42A.
Stamped on the top	WO 42

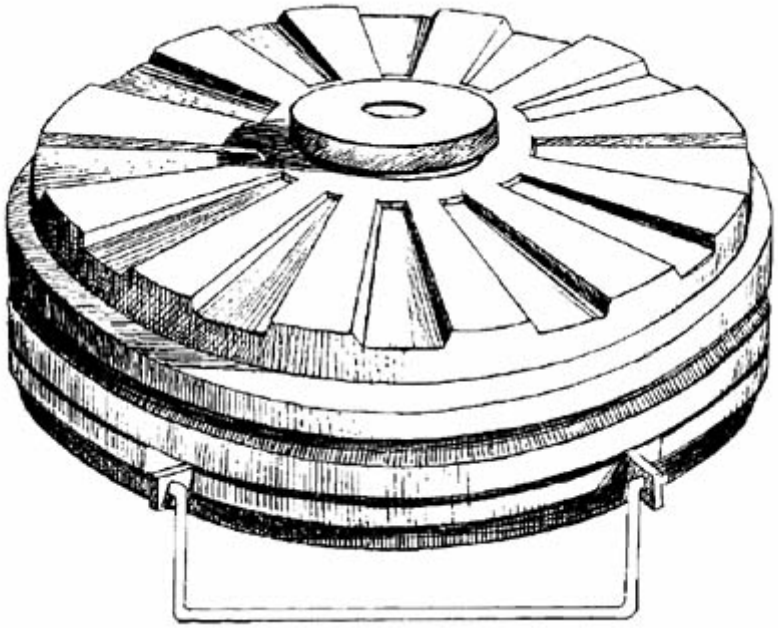


FIG. 3

In this model, the pressure plate extends over the entire top of the mine, and is fluted or grooved, probably to prevent sand being blown off when the mine is buried. In the center of the pressure plate is a threaded socket, closed by a screwed plug with, a milled head. This socket will take the standard brass igniter assembly as used with Tellermine No. 1 but the mine can also be used with igniter assembly of Tellermine No. 2, the igniter being inserted through the central socket and the screwed plug then replaced. Both types of igniters have been found in the field. The subsidiary igniter sockets are located on the bottom and side of the mine in the same places as in Tellermine No. 1.

d. Tellermine No. 4

The details of a fourth type of German Tellermine have recently become available. Tellermine No. 4 is circular in plan (see figure 4) with a diameter of 12.25 inches and over-all height of 3.4 inches. The base is flat and the cover slightly dome-shaped. The total weight of the mine is approximately 18 pounds. The mine is painted field gray, and the pressure plate black. Stencilled on the top of the mine in white is: "T. - Mi. - Pilz 43/T. - Mi. - Z42 13A"

There are two screwed holes for additional igniters, one in the side of the mine 4 inches from the carrying handle, and the other in the base, offset from the center--as in Tellermine No. 2. It has been reported that this mine has also been found with the holes for additional igniters located in the side of the mine opposite the handle and in the base between the handle and the center--as in Teller mines Nos. 1 and 3.

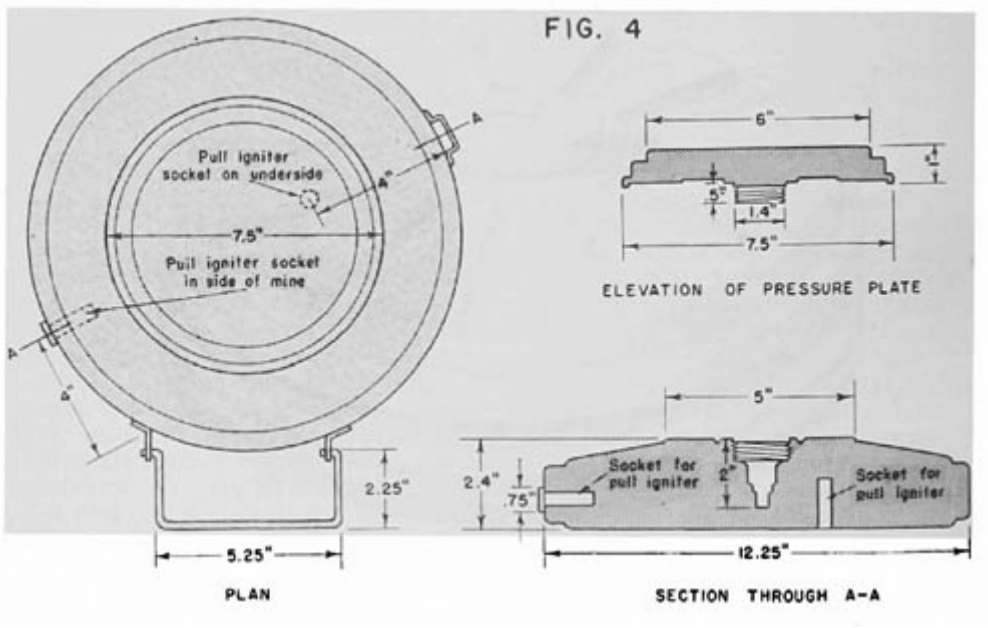


FIG. 4

The pressure plate is a flat metal plate 7 1/2 inches in diameter, which screws complete into the central socket over the normal Tellermine No. 2 igniter. Neither the pressure plate nor the body of the mine is fluted.

The mine functions when pressure on the pressure plate causes the latter to descend and shear the igniter shear pin, thus releasing the spring-loaded striker.

To neutralize this mine the sides and bottom of the mine should first be examined. If additional igniters are found, they should be neutralized. The pressure plate should then be unscrewed and the igniter removed.

e. Comparison

The pressure plates on Tellermines No. 1 and No. 3 extend over the entire top of the mines, but the pressure plates on Tellermines No. 2 and No. 4 cover only the center portion of the mine. Accordingly a tank might pass over the edge or rim of Tellermines No. 2 and No. 4 without detonating the mines, whereas the same load passing over the edge or rim of Tellermines No. 1 and No. 3 would detonate the mine. It is possible for a spread-out load of fairly low intensity

covering the whole top of Tellermines No. 1 and No. 3 to detonate them, while a more heavy, concentrated load is necessary to detonate Tellermines No. 2 and No. 4.

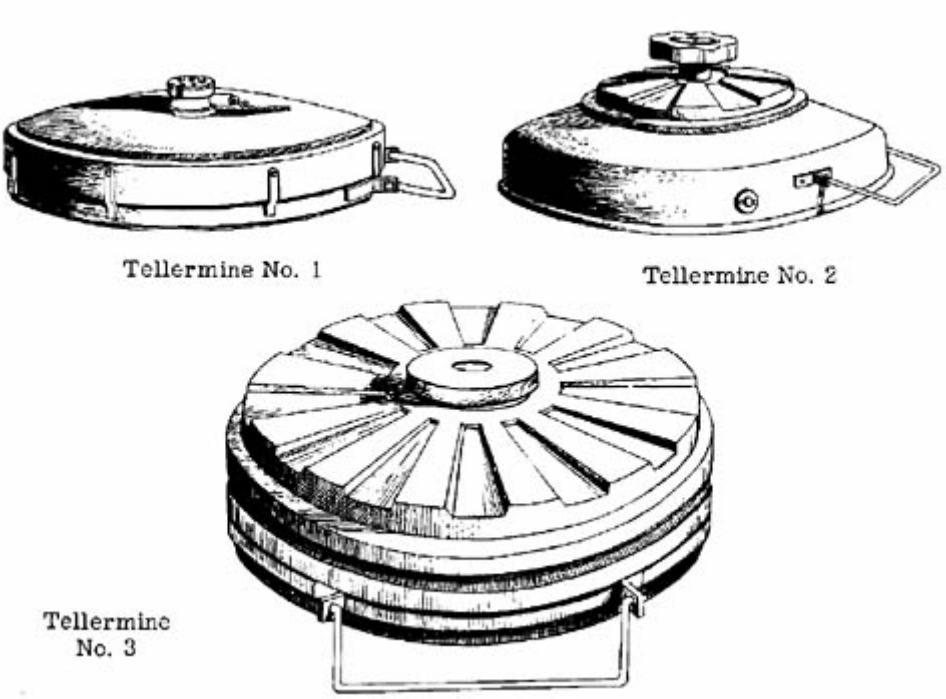


Fig. X

The pressure plates on Tellermines No. 2 and No. 3 are fluted or grooved, but the pressure plates on Tellermines No. 1 and No. 4 are smooth.

In Tellermine No. 4, by adopting a simpler form of pressure plate and utilizing the simple igniter found in Tellermines No. 2 and No. 3, the considerable production difficulties, which were entailed in the manufacture of Tellermine No. 1, particularly its T. Mi. Z35 igniter, have now been largely overcome.

INTELLIGENCE FROM GERMAN PRISONERS OF WAR

The following article on methods of dealing with German prisoners of war consists of excerpts taken from a personal letter written by a British Intelligence Officer in the North African desert. This officer's notes are based on his work at headquarters of the British XXX Corps during the winter campaign of 1941-1942. A few changes have been made in unfamiliar British military terminology, but otherwise the excerpts are presented verbatim.

Of particular interest both to U.S. Intelligence officers and to any U.S. soldiers who may be taken prisoner are the illustrations of the tremendous amount of information which is unintentionally divulged by prisoners of war.

"In static warfare evacuation of PW [prisoners of war] was easy, because they went back through the normal supply channels to the cage and thence to railhead. The great advantage was that they could be intercepted at any point, and there was always a little transport to spare for carting around a few who were specially interesting.

"In the armored battle, when movement was generally very rapid, it was impossible to arrange anything cut and dried. Interrogation could not be done forward of the FMCs [field maintenance centers] because IO [intelligence officers] at Div Hq and below were much too busy with other duties. My own view it that a second IO is essential at Hq of an Armd Div.

"The shortage of tactical interrogators is very marked. The cages at FMCs and railhead were manned almost entirely by CSDIC [sic] personnel. This is not satisfactory, except in a few cases, because CSDIC people know nothing about tactics, and, with respect, nothing about tactical interrogation either. It is essential to have interrogators who can do the job without calling in gunners, etc., to be present at the interrogation and telling them what questions to ask. The idea that interrogators need not be soldiers should be buried forever.

"Arrangements for interrogation were haphazard. Sometimes a tent was provided for the interrogators at the cage, sometimes nothing. Some form of cover is essential at the cage even in mobile warfare, and in a campaign like this where two foreign languages are involved, the arrangements should be duplicated. It would be a great help if each pair of interrogators could have one car, driven by a batman-driver; this car should be of the Humber staff-car type with an office table in place of the rear seat. A typewriter is an enormous asset.

"During the armored battle, liaison with interrogators was almost non-existent (a) because the intelligence staffs of higher echelons were too busy with other jobs, and (b) because there was no direct means of communication. During the static operations, it was very good, because (a) intelligence staffs had more time; (b) the FMC, though not the cage itself, was on the end of a line, and we put the interrogators in the picture at least once a day; and (c) we sent the interrogators our intelligence summaries daily. Results in this case were first-rate, and each day we gave the interrogators a list of the points which were of most immediate interest.

"The technique of tactical interrogation as taught at X [in England] seems to me, if I may say so, to be excellent. German PW have run true to form. They nearly always respond (a) to someone who shouts at them, and (b) to show of knowledge. Many of them are comparatively secure about tactical information, but most of them will at least admit their units.

"The 'show of knowledge' worked with one Pionier, who unlike most of his countrymen had no Soldbuch [paybook] and no Erkennungsmarke [identification tag] . He refused to give his unit and was asked 'You don't imagine that we don't know what German sapper units are in Libya?' - he said 'Yes, I do', but gave the name of his unit straight away as soon as the list of sapper units was reeled off to him.

"Other points which I have had a chance of verifying or discovering are (a) Never ask a leading question, (b) Don't ask too many questions one on top of the other, (c) If the PW doesn't answer a question immediately, always leave a longer pause than you think necessary; he usually says something in the end which will help the interrogation even if it doesn't give you any information, (d) Don't expect too much from interrogation. Training courses inevitably present interrogation as something a little spectacular. If a chap does produce a spectacular piece of information, go to great pains to check it; for this purpose it sometimes helps to deny what he says, so that he is obliged to give the reason why he knows, (e) Maps: out here at any rate it is practically useless to show a prisoner a map. The Germans apparently make little use of them; an Obergefreiter never has anything to do with one. If a PW starts to point out a route or a position on a map, he nearly always gets the scale wrong. It is best for the interrogator to have the map or the air photograph and to take some well-known reference point and then say 'You are standing here with your back to so-and-so. Now what do you see?' It is most important to cross-check any estimate of distance that a PW gives.

"I have held two parades of German PW, one of 16 men, and the other of 95. The words of command taught at X worked very well, and so did the idea of calling out the senior NCO and making him do the work. Here again a show of knowledge and authority helped a great deal. It was a good scheme to line them all up, tell them to place all their belongings on the ground in front of them and hold ready their Soldbuch and Erkennungsmarke. On the first occasion the old trick worked of saying 'Everybody in the 104 Lorried Inf Regt fall in over there'; on the other, after the fall of Bardia, I told the senior NCO, that rare specimen, a Hauptfeldwebel, to fall in the 95 other chaps according to units and, to my great surprise, he did it like a lamb.

"The Soldbuch was on the familiar pattern. Very occasionally a PW said he had handed it to the company office, and sometimes pages 3 and 4 were torn out. But practically always it gave the necessary information. All officers carried Soldbücher.

"During the operations at Bardia, Salum, and Halfaya, many PW did not carry paybooks. These had been taken away and kept with the Wehrpass at the company office, where, in many cases, they were duly found later on. Instead of a Soldbuch, PW carried a temporary certificate of identity giving the following particulars:

Rank, Christian name, Surname,
Date and place of birth,
Home address,
Date of arrival in Africa.

"The certificate was signed by the company commander and was stamped with the field post number. Identification was therefore possible in most cases.

"The certificate was typed on any piece of paper. When folded it was much the same size as a Soldbuch. A facsimile is reproduced below. Occasionally particulars of pay were entered on the back of the certificate, and in these cases the company commander's signature and field post number were repeated.

Vorlaufiger Personal-Ausweis.

Inhaber ist der _____

(Dienstgrad, Name, Zuname)

geb am _____

wohnhaft in _____

(written in) Am . . . . . auf afrikanischem Boden eingetroffen

(Official stamp) . . . . . .

(Unterschrift)

"Erkennungsmarken were of three kinds (1) showing the man's present unit - this was comparatively rare, (2) showing the man's ersatz unit - this was the most common, (3) giving a number, usually so far as I remember of five digits but not the field post number - this is evidently a new kind; very few PW have it.

"The field post number was invaluable as a means of identification. From quite early on, Army compiled a fairly extensive list, and this must have been of great help to regular interrogators. I think that in the first few days of a campaign it is most important that field post numbers should be reported with identifications.

"Documents were almost fantastic in their quantity and their value to us. Examples are (a) the capture by 30 Corps on D2 of a map showing the dispositions of all German units before D1; (b) the capture by 13 Corps of a valuable operation order, and (c) by far the biggest capture, the complete signals office of 21 Pz Div during the first week of the offensive. Minor examples are legion: war diaries, code names, photographs showing new weapons, training pamphlets, intelligence summaries, personal diaries, casualty returns and so on. Two things stand out from the IOs point of view; he must know Schrift as well as possible, and he should have a very good knowledge of German conventional signs; the Germans use them for marked maps, orders of battle, operation orders and vehicle markings, in fact wherever possible. If an IO knows them by heart he will save himself an immense amount of time.

"Out here almost all the organizations have something peculiar about them; but a knowledge of the normal organization helps a lot. I believe that it would be a good aim to have everyone leaving X knowing the organization of the German Inf and Armored Divs backwards. An IO who knows his way about enemy weapons is invaluable.

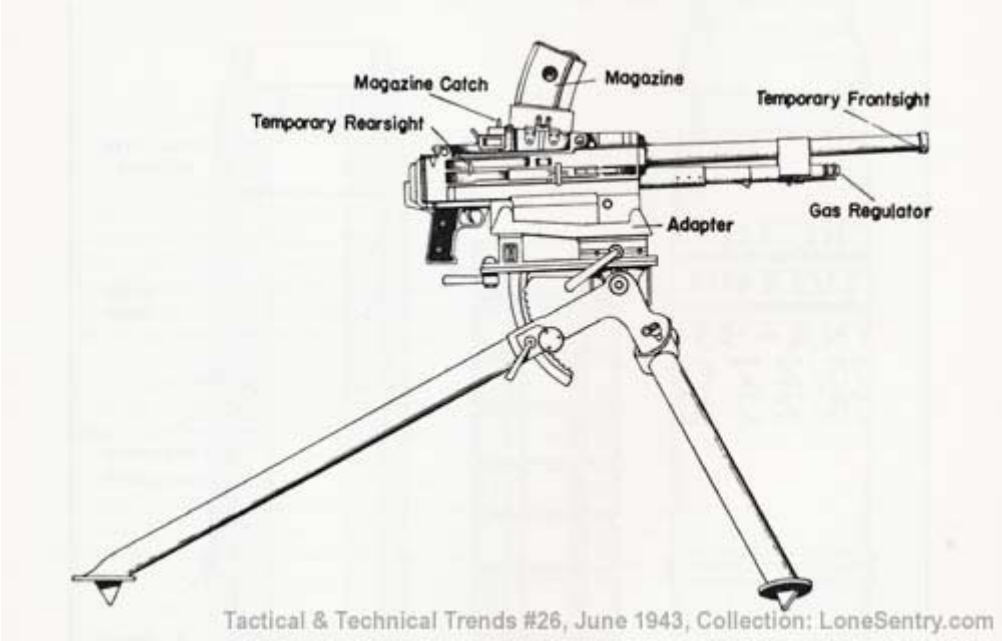
ITALIAN 8-MM BREDA MEDIUM MACHINE GUN, MODEL 38*

This weapon is a tank-pattern machine gun, and is fitted as standard in the following Italian tanks: the 6 1/2-ton Light (1940), the 11-ton Medium (1939), and the 13-ton Medium (1940).

The Italians have also adapted it for use as an infantry machine gun. For this purpose the gun is mounted on a machine-gun tripod (as shown in an accompanying sketch) by means of an adapter, and is fitted with a temporary rear sight on the right of the body and a temporary front sight on the right of the barrel at the muzzle. These temporary open sights take the place of the optical sight used when the gun is tank-mounted.

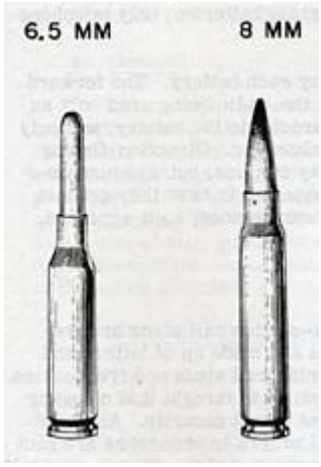
The gun is also sometimes fitted with a "cartwheel"-type AA sight and arranged either alone or with another "twin" gun on an AA mounting.

The gun is air-cooled, gas-operated, and magazine-fed, and has a quick-change barrel. Its operational features are simple, and it is extremely easy to field-strip or disassemble completely. The barrel is sufficiently heavy (9 7/8 pounds) to enable it to fire a large number of rounds in quick succession without overheating.



The following are some of the characteristics of this weapon:

Weight of gun	33 7/8 lbs
Weight of barrel	9 7/8 lbs
Length of gun (over all)	35 1/2 in
Length of barrel	23 in
Feeding device	24-round vertical box magazine
Maximum (cyclic) rate of fire**	600 rpm
System of operation	Gas piston
Rifling - uniform, RH twist	Concentric
No. of grooves	4
Cooling system	Air



With ball ammunition, the maximum accuracy range is 800 to 1,000 yards, and the muzzle velocity is estimated to be about 2,600 feet per second. In addition to ball, the following types of ammunition are known to exist:

Armor-piercing	Green tipped
Armor-piercing tracer	Red tipped
Incendiary	Blue tipped
Tracer	Red or green tipped

It is believed that this ammunition can be used only in automatic weapons. Of the various standard Italian automatic weapons, in addition to this Breda 38, two other 8-mm medium machine guns, the model 35 Fiat (Revelli) and the model 37 Breda***, are known to use this 8-mm ammunition. The ammunition cannot be used in the standard Italian infantry rifle, carbine, and light machine guns, the caliber of which is 6.5 mm, nor can it be used in the Italian 7.35-mm Breda 38 light machine gun**** or the German 7.92-mm weapons. For a comparison of the external appearance of the 8-mm and 6.5-mm ammunition, see accompanying sketch.

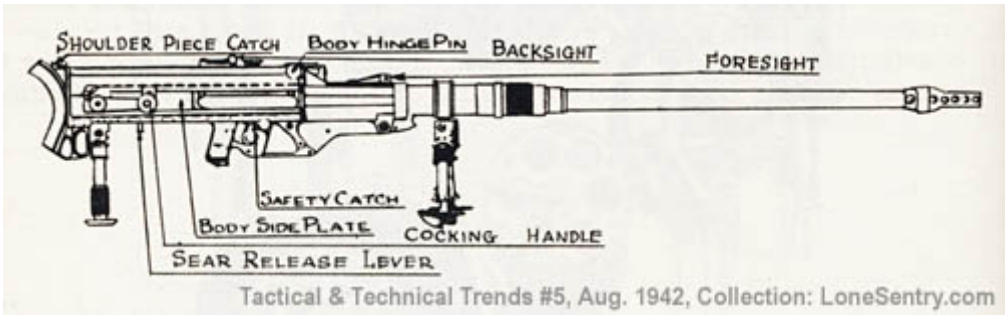
* Extracted from a recent Aberdeen Proving Ground report.
** This information has not been checked by U.S. test.
*** See Tactical and Technical Trends, No. 23, p. 25 for a description of this gun.
**** This weapon has not been encountered in combat.

ITALIAN 20-MM. ANTITANK RIFLE (SOLOTHURN)

This antitank rifle is a self-loading, single-shot weapon. The rifle can be set at "safe" or "fire" by means of a thumb-operated catch on the pistol grip. (See accompanying sketch.) It is fired from the shoulder off the bipod. Some of its specifications are as follows:

Caliber	20 mm. (.79 in.)
Weight with empty magazine	120 1/2 lbs.
Overall length	7 ft. 1 in. (including recoil reducer)
Rate of fire	10-20 aimed r.p.m.
Sights (a)	Blade foresight, leaf backsight, leaf backsight graduated to 1,500 meters
(b)	Telescopic sight mounted on bracket
System of operation	Recoil. Breech positively locked on firing by rotation of locking lugs
Feed	Magazine capable of holding 10 rounds, but normally loaded with 8 rounds only
Weight of H.E. and A.P. shell	4 ozs.
Muzzle velocity	2,750 f.s.
Penetration (armor plate at 500 meters, 90°)	30 mm.

Remarks: This gun is carried by two men and is sometimes found on tanks, armored cars and motorcycles. It is effective only in keeping mechanized patrols at a distance.



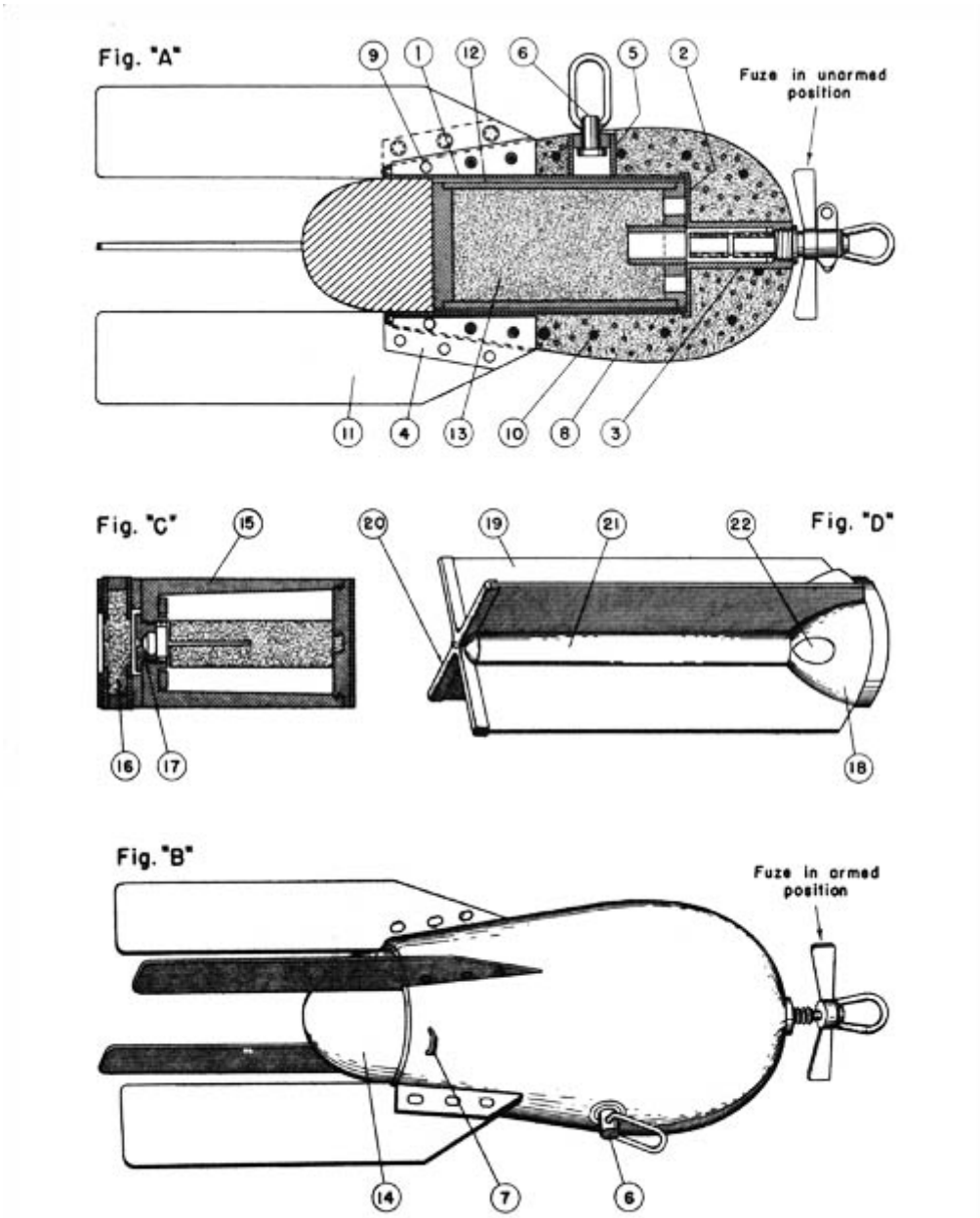
Italian 20-mm. Antitank Rifle

ITALIAN 5-KILOGRAM TARGET-INDICATOR BOMB

The report on this particular type of bomb, known by the Italian name of bomba vento, gives the following dimensions:

Total weight	11.5 lbs (approx)
Over-all length (without fuze)	15.2 in
Over-all length (with fuze)	17.4 in
Length of body	8.9 in
Length of tail	9.2 in
Maximum diameter of body	5.2 in
Diameter of tail	7.0 in

The bomb is formed on a thin, sheet-metal cylinder (1) - see figure A - 6.7 inches in length and with a diameter of 3.1 inches. The lower end is closed by a thin steel disk (2) which has a central hole 0.9 inch in diameter. The fuze tube (3) is fitted over this hole and pressed into the disk (2). The four supports (4) for the vanes are spot-welded to the side of the cylinder. The short tube (5), 1 inch long and threaded at its outer end to receive the suspension lug (6), is also spot-welded to the cylinder (1). (For vertical suspension the lug in the fuze is used.) Four additional short tubes of small diameter are welded over four corresponding holes near the open end of the cylinder. One pair of these short tubes, which are 0.9 inch apart, lies symetrically between two vanes, and the other pair directly opposite between the other pair of vanes. They are intended as guides for the wire*(7) (see figure B). The bomb body (8) consists of hard concrete in which steel pellets are embedded. Two sets of spiral reinforcing are provided. Three turns of wire (approximately 16 standard wire gauge) are wound clear of the cylinder (1) near the open end. The wire passes through holes (9) in its vane-supports (4) and is welded at its end to the cylinder. Five turns of heavier reinforcing (about 8 standard wire gauge) are wound as shown at (10). This wire is welded to the cylinder (1) at one end and to the tube (3) at the other.



ITALIAN TARGET-INDICATOR BOMB

The vanes (11) are made of aluminum alloy and are riveted to the supports (14).

The cylinder contains the bomb filling, which may consist of a cardboard tube (12) filled with a smoke composition (13). The cylinder is closed by a cork plug (14, in figure B) held in position by the wire (7). The smoke composition is labelled Luce e Fumo Bianco, which indicates that a flash as well as a white smoke is emitted from the bomb.

An alternative filling which has been found consists of a 1-kilogram incendiary bomb (15, in figure C) with a black-powder charge (16) placed between it and the fuze when assembled in the vento bomb. When so employed, the incendiary bomb has the usual transit plug (21) drilled to take the flash from the charge (16).

An alternative tail has been recovered in which the cork plug (14) is not used to close the bomb, but instead a wooden plug of the shape shown at (16) figure D performs the double function of closing the bomb and supporting the vanes. These latter, shown at (17), are 8.7 by 2.6 in. and made of three-ply wood. They are inserted in slots in the plug (16) and are strengthened by a metal binding (18) and by four level strips (19) running the whole length of the vanes. There are four holes (20) passing through the plug located halfway between each pair of vanes. The plug (16) is attached to the bomb by four nails inserted through the concrete body. The fuze employed in this bomb is type S.

From specimens examined it would appear that the concrete bombs, which are fitted with wooden tails, have no fuzing arrangement. In one case, there was no metal cylinder (1) or fuze tube (3). A single suspension lug was cast in the bomb at the nose. It is thought that these may be the Italian practice bomb, Bomba 5E.

It is learned from Italian sources that the vento (wind) bomb is designed to be used in conjunction with the 500-kilogram gas bomb (Bomba 500 0). The purpose of the bomb when dropped is to indicate the force and direction of the wind at ground level. The former is estimated from the angle the smoke makes with the ground, and the latter from the direction of the smoke trail.

During the day, the "smoke" filling is used, while as an alternative at night, the incendiary filling would be effective.

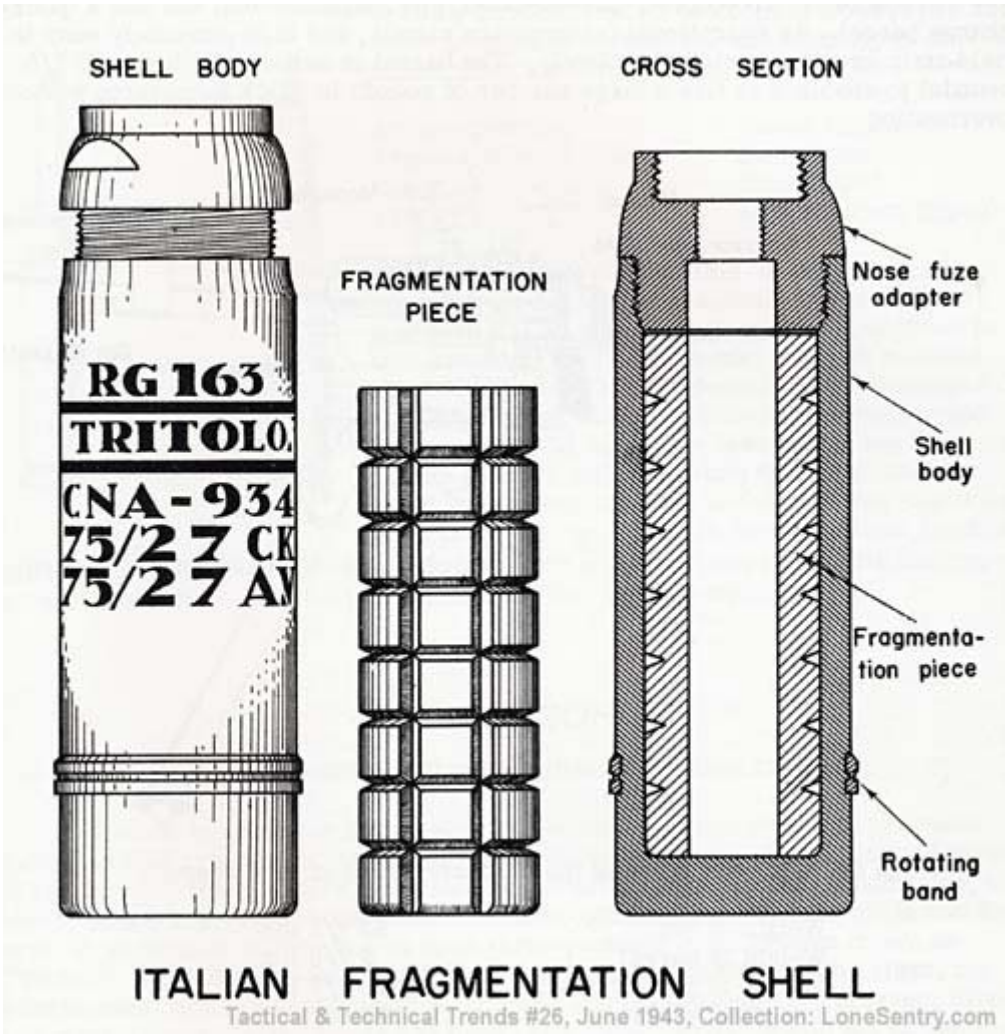
*i.e., to provide a passageway through the concrete body of the bomb for the wire.

ITALIAN 75/27 HE FRAGMENTATION SHELL

The unusual feature of this ammunition is a "fragmentation piece," or segmented metal cylinder filled with TNT. The detonation of the shell is intended to break up the cylinder into small squares, thereby augmenting the antipersonnel effect. The shell body is of carbon steel, probably of low tensile strength, and is punched and drawn with a solid base, and the cavity is machined. There is a single copper rotating band. The nose, fuze adapter, and fragmentation piece are machined castings in gray cast-iron.

The shell may be identified by its specially processed gray surface with a 15-mm (.58-inch) light blue band, 20 mm (.79 inch) forward of the rotating band. An examination of the shell produces the following descriptive data:

Weight of shell body	6.98 lb	Length of shell body	7.97 in
Weight of nose fuze adaptor	1.87 lb	Length of nose fuze adaptor	2.16 in
Weight of fragmentation piece	3.85 lb	Length of fragmentation piece	6.46 in
Total weight (unfilled, unfuzed)	12.7 lb	Length of shell, unfuzed	9.25 in
		Length of shell in rear of Rotating band	1.48 in



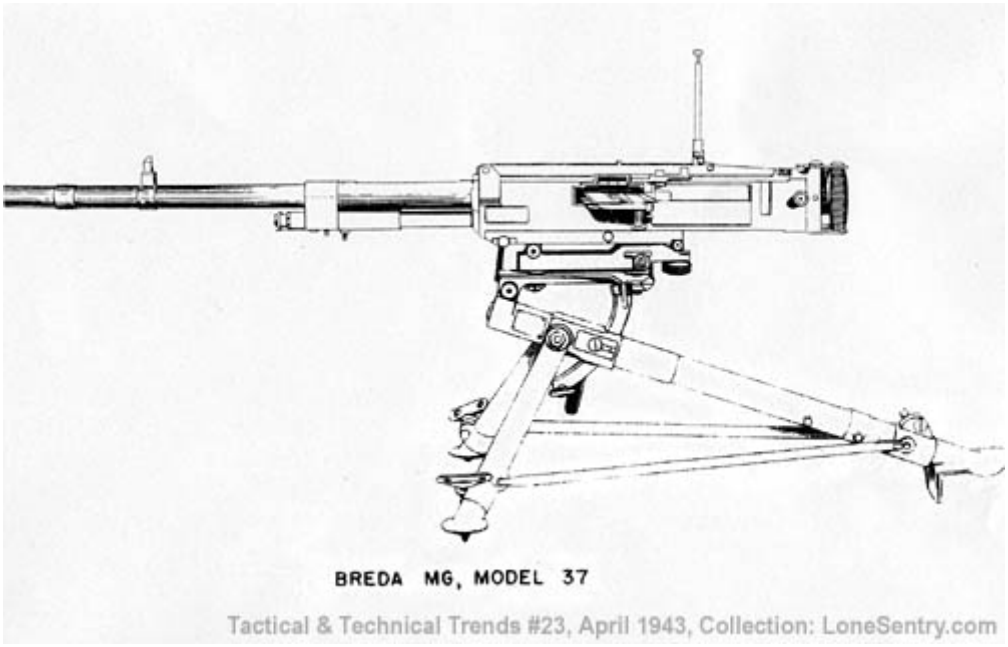
ITALIAN 8-MM BREDA MEDIUM MACHINE GUN, MODEL 37

a. General

This machine gun is not dissimilar to the French Hotchkiss, with the exception of the thumb trigger, like the British Vickers. From the following report, prepared at the Aberdeen Proving Ground, it appears to be an excellent gun.

The gun is gas-operated, air-cooled and has a quick-change barrel. The cartridges are fed from plate chargers holding 20 rounds, each round being housed in a separate compartment (see sketch). After firing, the empty cases, instead of being ejected, are replaced in the compartment of the plate charger.

The gun uses ammunition very similar to our own with the exception of the case which is shorter and the caliber which is .015 of an inch larger. It is made in ball, tracer, and incendiary tracer armorpiercing. The German 7.92-mm ammunition can also be used.



BREDA MG, MODEL 37

b. Description

Following are characteristics of this gun:

Caliber	8 mm (.315 in)
Weight	44 pounds
Length over-all	50 in
Weight of barrel, complete	17-3/4 pounds
Length of barrel, complete	33-1/4 in
Rifling	4 lands, right hand twist
Rear Sight:	
Elevation	300 to 3,000 meters
Windage	0 to 8 mils plus or minus (0 to 2-1/4° plus or minus)
Cyclic rate of fire (maximum)	450 rounds per minute*
Effective rate of fire	Unknown
Muzzle velocity	2,600 feet per second*

Maximum range	6,500 yards*
Cooling	Air
Mounting	Tripod
Feed	20-round plate charger
Provision for single-shot fire	None
Safety	Shift safety catch on top of rear cross-piece to S for "safe" and to F for "fire".

The accompanying range table covers the Breda Model 37 and also the Fiat Model 35.

c. Tripod Mount

The mounting is provided with elevating and traversing gears, which can be used in conjunction with the open sights for direct laying, or with the elevating and traverse scales for indirect laying.

Elevation is adjustable from 360 mils (20 degrees) depression to 360 (20 degrees) elevation, with a micrometer adjustment from the 46 mils (2 degrees 30 minutes) depression to 36 mils (2 degrees) elevation.

The main traverse scale is graduated from 450 mils (25 degrees) to 1,150 mils (65 degrees) in 10 mil steps, the central position being at 800 mils (45 degrees). An additional 150 mils (8 degrees 30 minutes) traverse is provided by an independent micrometer adjustment.

RANGE TABLES FOR ITALIAN 8-MM MGs--FIAT MODEL 35 AND BREDA MODEL 37, FIRING MODEL 35 BALL AMMUNITION

Range (yds)	Fiat 35 Elev. (mils)	Breda 37 Elev. (mils)	Range (yds)	Fiat 35 Elev. (mils)	Breda 37 Elev. (mils)	Range (yds)	Fiat 35 Elev. (mils)	Breda 37 Elev. (mils)	Range (yds)	Fiat 35 Elev. (mils)	Breda 37 Elev. (mils)
100	1	1	1200	19	19	2300	68	66	3400	150	148
200	2	2	1300	22	22	2400	74	72	3500	159	158
300	3	3	1400	25	25	2500	80	78	3600	168	168
400	4	4	1500	29	28	2600	86	84	3700	178	179
500	5	5	1600	33	32	2700	93	91	3800	188	190
600	6	6	1700	37	36	2800	100	99	3900	199	202
700	8	8	1800	41	40	2900	108	107	4000	210	214
800	10	10	1900	46	45	3000	116	114	4100	221	226
900	12	12	2000	51	50	3100	124	122	4200	234	239
1000	14	14	2100	56	55	3200	132	130	4300	247	253
1100	16	16	2200	62	60	3300	141	139	4400	261	286

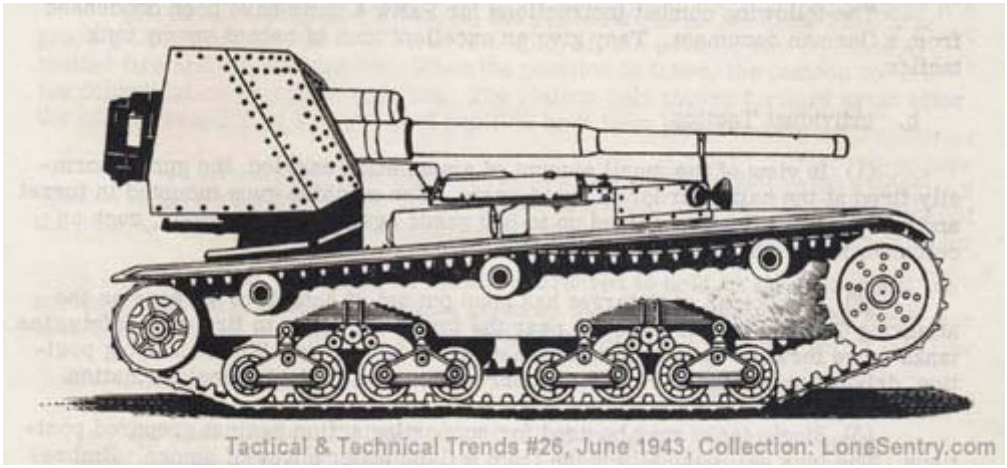
Standard conditions: barometer 750 mm (29.5 in) of mercury, temperature 15° C (59° F), humidity 0.5 (half-saturated air).

Comment: The gun is quite simple in its operational features, and is extremely easy to disassemble. The breech is positively locked at the moment of firing, the breechblock being forced up (without tilting) by the action of inclined surfaces on the piston extension, so that a projection on its upper surfaces engages in an opening in the top of the body. The barrel is sufficiently heavy (17-3/4 pounds) to enable it to fire a large number of rounds in quick succession without overheating.

*This information has not been checked by U.S. test.

ITALIAN 90/53 SELF-PROPELLED GUN

There has been a previous reference in Tactical and Technical Trends (No. 25, p. 48) to the Semovente (self-propelled) 90/53* gun. Further information on this Semovente 90/53 (3.54-inch) self-propelled AA/AT gun has been received.



On the basis of the present report, it appears that this gun is mounted on the rear of a turretless 14-ton, Model 14/41 tank chassis. In order to accommodate the gun, it would appear that the normal positions of the engine and transmission in the hull have been rearranged. The engine, normally in the rear, seems to have been moved forward to the center of the hull, access being provided by two doors in the superstructure roof. There is probably room for one member of the crew besides the driver in front of the engine. It would seem that the engine is overloaded, so that the vehicle is slower and less maneuverable than the M 14/41 tank. The speed probably does not exceed 12 mph. Presumably the 125-hp Diesel engine of the M 14/41 tank is retained.

*Caliber 90 mm, length of bore 53 calibers.

ITALIAN PARACHUTE ARTILLERY EQUIPMENT

A number of prisoners of war from an Italian parachute artillery unit have revealed the following details of their equipment.

The type of parachute used is known as the "I.F." (Imbracatura Fanteria) which opens automatically. White parachutes are used for personnel. Jumps were made during training from heights varying between 800 and 400 feet. No jump is ever made from a lower level than 300 feet. One of the prisoners described a jump in which seven men had to leave the aircraft in 4 seconds. They were trained to launch themselves from the aircraft with arms and legs spread-eagled. The types of aircraft employed during training were the Caproni 133 (tri-motored transport type) and the Savoia-Marchetti 82 (tri-motored transport type).

Each man is stated to carry the following equipment: a haversack containing 40 hand grenades, a Beretta machine-carbine with 400 rounds of ammunition strapped to the right leg, and 3 days' iron rations and 1 quart of water. Mention was also made of revolvers and daggers, but the scale of issue was not stated.

The uniform appears to consist of an officer-type blue-gray tunic with lapels and large breast and side pockets, skiing-type trousers, and high black leather ankle-boots with toecaps and a rubber sole and heel in one piece. (This is not worn in North Africa.) The normal Italian steel helmet is worn, with a special lining and a neck protector. For protection when landing, gloves and knee pads are worn. An insignia consisting of a sword with a single wing is worn superimposed on the usual artillery collar patch, and a yellow parachute design is worn on the left upper arm.

Forty-seven-mm guns and ammunition are dropped in separate loads, by means of blue-colored parachutes, in special canvas sacks called Aero Rifornitori or Sacci Rifornitori. These sacks bear different markings which indicate their contents:

Gun barrel	Yellow flag
Ammunition	Red circle
Wheels and trail	Blue circle
Carriage	Black circle

The ammunition is packed in specially lined metal boxes containing either 4 or 8 rounds. The prisoners were uncertain as to the actual number, and were not able to say how many boxes were dropped in each sack.

ITALIAN TANK SIGNALS

The following report gives some Italian tank signals used by Italian forces operating in the North African theater.

(a) A triangular white (wooden) signal;

Shown repeatedly, means, "Pay Attention."

Shown continuously, "Go on or Stop" according to whether the signal is made at the halt or on the move.

(b) A triangular white signal above a triangular red signal;

Shown repeatedly, "Increase distance and space between tanks"

Moved sideways intermittently, "Form line."

Moved sideways continuously, "Form wedge."

(c) A triangular red signal above a triangular white signal;

Shown repeatedly, "Reduce distances and spaces between tanks."

Moved back to front intermittently, "Form columns."

Moved back to front continuously, "Form half platoons in line abreast."

(d) A triangular red signal;

Shown continuously, "I am in trouble," "I cannot carry out my task."

All of these signals, except that last, which is made only by the tank that is in difficulty, are made by the unit commander; and individual tanks repeat the signal to show that they have been understood.

LAYING OF ENEMY LARGE PROTECTIVE MINEFIELDS

A study of the enemy employment of minefields in North Africa has shown their various tactical uses. One of the principal of these uses is the protection of the entire front of a major defensive position. This type of minefield can be designated the "Large Protective Minefield," and its construction follows a more or less fixed procedure. This procedure results in protection being built up gradually but concurrently along the entire front. The first steps are such that they give the maximum initial protection and at the same time serve as an important part of the final installation. The actual construction can be conveniently divided into three phases, which are described in the following paragraphs.

a. Phase One

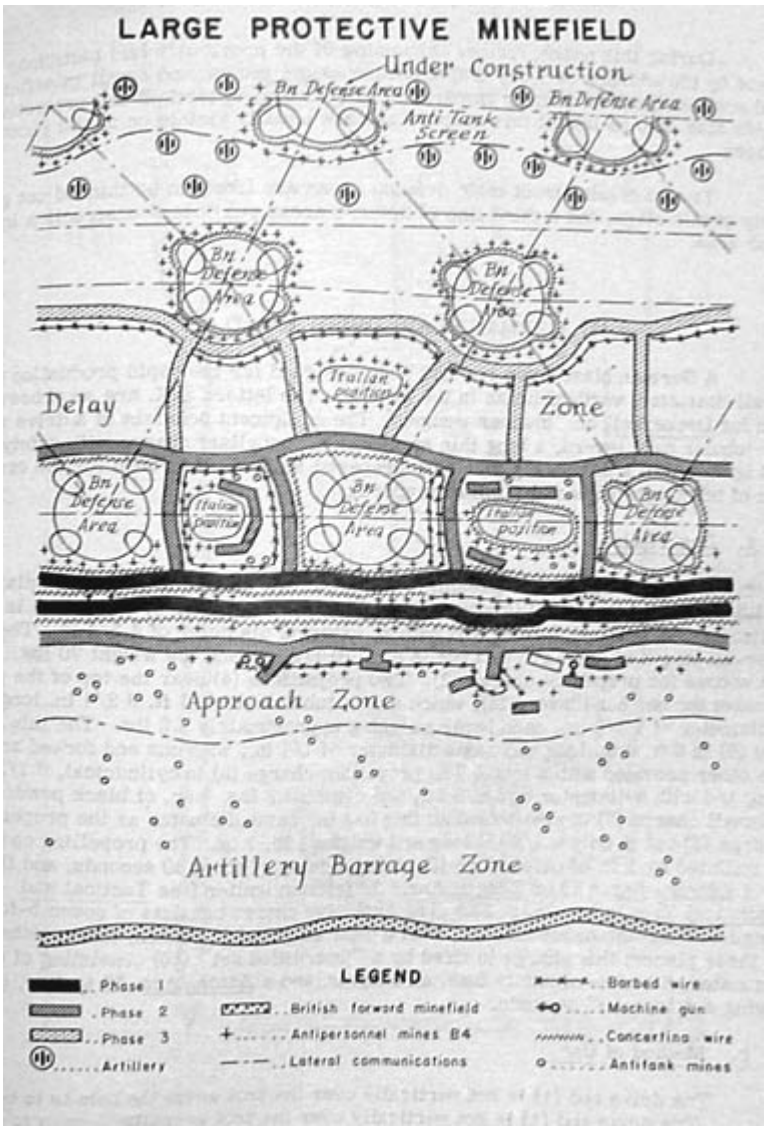
A single continuous belt of mines is laid along the entire front. This belt is generally marked and protected on both sides by concertina or barbed wire; the spacing between the rows of wire is usually about 200 yards, but may be as much as 800. While this initial belt is being laid, the incomplete points in the line are held or supported by armor.

As soon as the initial belt and marking wire have been laid, thickening of the field is begun by placing an additional belt of mines in front of the forward wire marking the initial belt. The front edge of this second belt is generally not marked during this phase of preparation. From the start, the area mined during this phase is covered by short range, small-arms and antitank fire, while listening and machine-gun posts are interspersed throughout the field.

While this initial phase of mine-laying is under way, the construction of the battalion defense areas is in progress behind this belt of mines. These defense areas are being spaced from 1 to 2 miles from center to center in mutual support as shown on the accompanying sketch, As these defense areas and the mine belts near completion, the armor is moved to the rear for a counterattack role.

b. Phase Two

One step in this phase is the marking and protecting by concertina or barbed wire of the second belt of mines laid in the first phase, and the thickening of the field by placing an irregular belt of mines in front of the new forward wire. This forward belt is complicated by numerous unmarked tactical spurs and small scattered minefields farther out, together with scattered wire obstacles and false gaps. This forward zone is likely to be sown with all forms of antipersonnel devices and automatic trip wires. It may extend as much as 800 yards in front of the original front wire.



A second step is to lay a belt of mines to afford protection to the second line of defense areas, which is being constructed during this phase. The minefields are from 100 to 200 yards deep and are sometimes not as clearly marked as the front fields. The defense areas are echeloned back from the original defensive line, and tactically sited to support it. The second line of defense areas form triangles, on 1 to 2 mile centers, with the forward defense areas.

Another step in this phase is to interconnect the original mine belt and the rear belt described in the proceeding paragraph; these interconnections serve, by hindering lateral movement, to canalize and disorganize any enemy penetration through the frontline belt. This, in effect, serves to compartment every local success of the enemy. In this connection it has been noted that although the layout and marking of the minefields may appear ill-defined or haphazard to the ground observer, they are generally very distinct on air photographs.

c. Phase Three

A third line of minefields, generally well marked, is then laid to give additional protection to the front and flanks of the second line of defense areas. This new line of minefields may at this time be connected with the second belt of mines discussed in phase two; it serves to further compartment the field

and to disrupt lateral movement by the enemy in event of local enemy successes. The third line of minefields Is usually about 200 yards deep. During this phase, further thickening of the previously laid belts may take place by the addition of booby traps, antipersonnel mines, and small minefields and scattered mines, usually unmarked. In rear areas, tactical and protective fields may also be laid at this stage; these are usually visible on aerial photographs

Troops holding front main defense areas are likely to be thinned out gradually at this stage, and a third line of defense areas put under construction in the rear area.

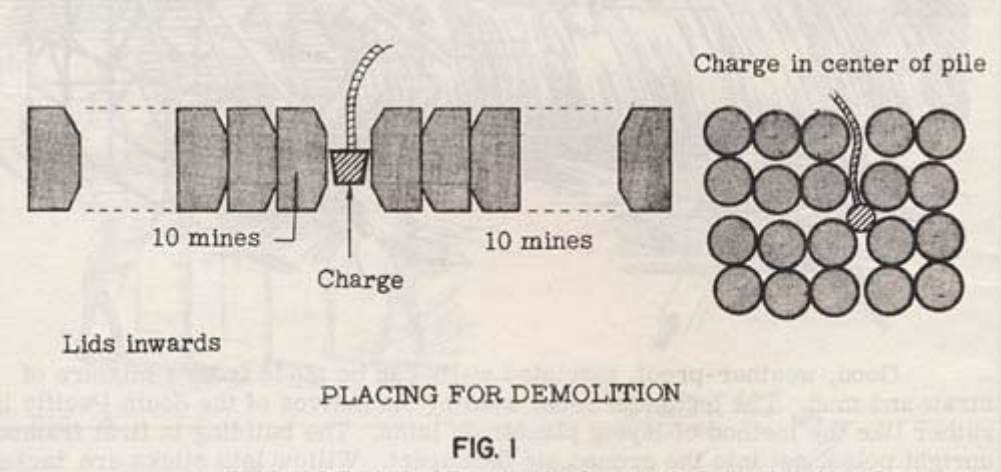
METHODS OF CLEARING MINEFIELDS

The importance which land mines has assumed in modern warfare has been discussed in Tactical and Technical Trends No. 27, p. 15, and No. 28, p 15 with reference to the laying of enemy minefields and the construction of enemy land mines. A knowledge of the different methods of clearing enemy minefields is as important as an understanding of the enemy tactics in laying the minefields. Information concerning the following methods for clearing minefields was taken from Allied sources covering operations in North Africa. In the first five methods the working party did not exceed one NCO and four men.

a. Lifting and Placing in Dumps of 20 to 40

After locating, the earth was cleared around the mines and, without touching the igniter assembly,* the mines were lifted and carried a distance of approximately 30 yards depending on the size of the dump.

They were either laid flat on the ground or on edge, with the top covers pointing inwards (see figure 1). The initiating charge was 1 primer, 1 detonator and 6 feet of safety fuze.



PLACING FOR DEMOLITION

FIG. 1

In the open country, clear of buildings, water mains or telegraph lines, a series of dumps of 30 to 40 mines were blown electrically using the truck storage battery as an exploder.

The rate of work was 60 mines per man per day;
The number lifted by the method, 80,000 approximately;
Casualties - nil;
Failures during firing - nil;
Type of country - rough with average undergrowth.

b. Cat-O-Nine Tails

This was not very successful. Experiments proved that the method could only be used on very level ground and even then the mines cannot be drawn close enough (see figure 2) to insure that one charge will detonate them. It was found that they either had to be handpacked, or two or three separate charges were necessary to destroy each dump.

Rate of work (a) rough ground: no figure produced;
(b) even ground: 25 mines per man per day;
Number lifted by the method: 3,000 to 4,000;
Casualties - nil

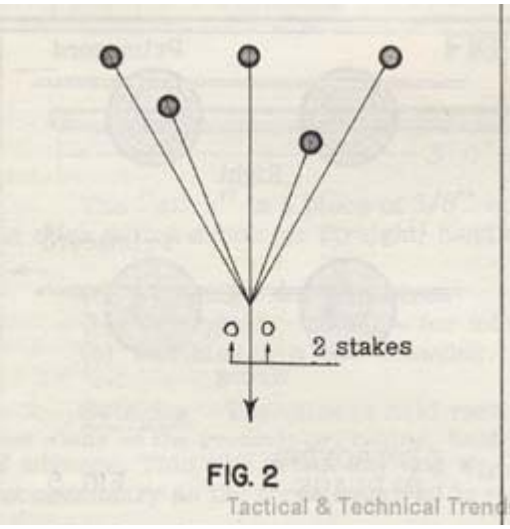


FIG. 2

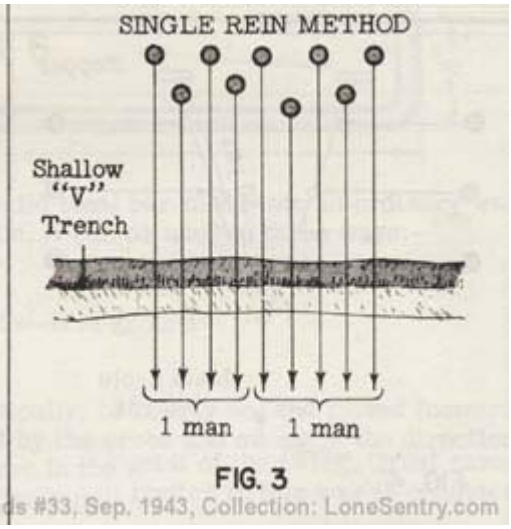


FIG. 3

c. Single Rein Method

This method was quite successful, even over rough ground. One man controls two or three and, over good ground, possibly four separate reins, which are made up of old signal cable (see figure 3).

The mines are pulled into a shallow V-shaped trench from a distance of about 100 yards. The initiating charge is similar to that in method No. 1.

It was found that blowing up in dumps of about 10 was the most convenient number.

The rate of work: 30 mines per man per day;
The number lifted by the method, 60 to 70,000;
Casualties - nil;
Type of ground, average.

This method was not given fair trial over smooth ground. The rate of work in that type of ground would probably be 40 mines per man per day.

d. Six in One

This method was the quickest over smooth ground. It would undoubtedly have the disadvantages of other methods on rough ground. One man is capable of drawing in six mines at once with the assurance that they will be close together in the pit.

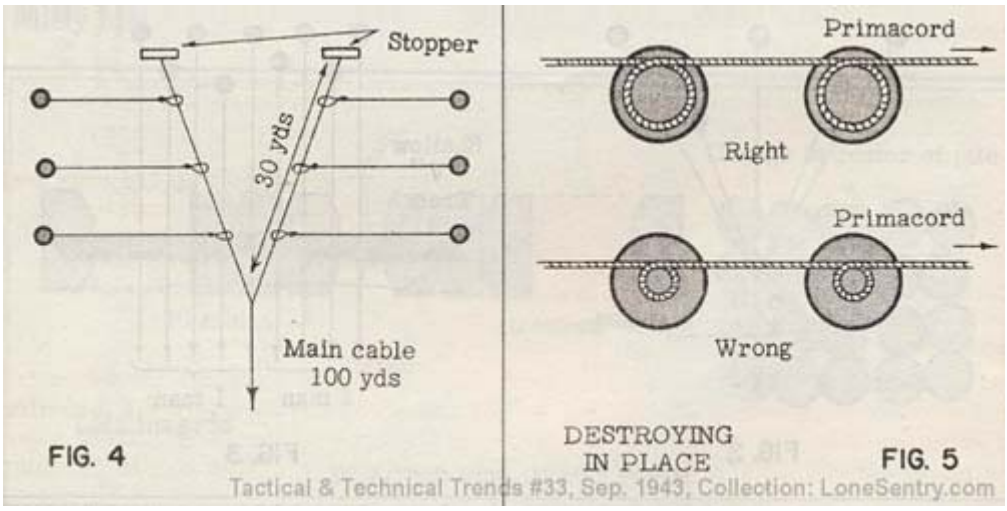


FIG. 4 FIG. 5

The main cable is 100 yards long and the two shorter lengths about 30 yards, each having a wooden stopper at the end (see figure 4). The six lengths that are attached to the mines are fastened by making a running loop on the 30 yard lengths. The wooden stopper prevents the loops from slipping off the 30 yard cable.

A suitable arrangement is for the men to work in pairs and draw in 24 mines to each pit.

Initiating charge as in previous methods;
The rate of work, 45 to 50 mines per man per day;
The numbers lifted by the method, 50,000, approximately;
Casualties - nil;
Nature of ground; smooth sand.

e. Destroying in Place

Primacord (instantaneous fuze) is ideal and does not require any subsidiary explosive. A loop on the top of each mine held in place by a stone is sufficient (see figure 5).

One main point, however, is that the loop must be at least 3/4 the diameter of the mine, so that the pressure is towards the outer edge. Failures were reported if the loop was too small.

f. Walking Stick Method

The method of walking through a mined area using a walking stick (also known as the three-legged method) as described below has been used successfully (see figure 6).

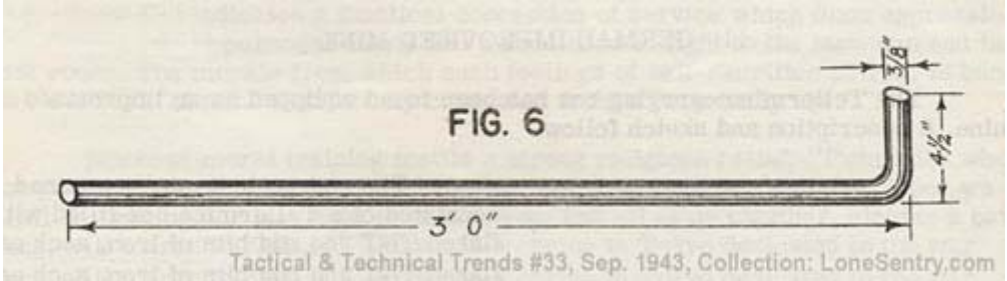


FIG. 6

The "stick" is a piece of 3/8" mild steel bar made into an ordinary walking stick with a crook (or straight) handle. It can be used in three ways:-

(a) Swinging - for trip wires

(b) Testing or prodding - for mine-free ground

(c) Swathing by a man crawling.

Swinging - The stick is held vertically, or nearly so, and moved forward just clear of the ground; or, better, held by the crook and swung in the direction of advance. This will detect any trip wires in the orbit of the swing. Great care is not necessary as the force required to fire a pull igniter in this way is considerable.

Testing - The stick is held at an angle of about 45 degrees and used to test the ground for one's next foot print. If the earth feels soft the stick is pushed into it and used as a probe.

In walking through a minefield, the stick is used for swinging and testing in more or less one movement.

If any obstruction is met with, the spot is NOT further investigated (unless on a mine reconnaissance), and another place is tested.

Swathing - A man crawling uses the walking stick held horizontally and flat on the ground. He thus sweeps an arc of ground immediately to his front to detect 3-pronged igniters. The stick can also be used (held half-way down) as a "short arm" prodder.

g. Clearing Antipersonnel Minefield

From a recent report on clearing an enemy antipersonnel minefield the following points have been noted.

(a) A careful search with a detector to insure 100 per cent clearance is necessary.

(b) Engineers checked one field where they found two mines overlooked by the infantry who had already reported the area clear.

*Of course any booby traps would first be neutralized, and it is thought that the igniter's are also neutralized

SUMMARY OF OPERATIONS IN NORTH AFRICA, 1940-1942

Marshal Graziani's offensive against Egypt in September 1940 was the first of five campaigns which have been fought over the Western Desert.

This first offensive, starting from Bardia on the Libyan-Egyptian border, pushed only as far as Sidi Barrani in Egypt before it was halted by the British. The first British offensive (second campaign), launched in December, crushed any hopes Graziani may have had of moving on to the Suez Canal, for Wavell's troops not only accomplished their objective of pushing the Italians over the border into Libya, but moved on across Cyrenaica as far as El Agheila, where over-extended lines of communication finally halted the drive in February 1941. The second Axis drive (third campaign), against British forces depleted by withdrawals from the Balkan Campaign, introduced Rommel's Afrika Korps, which, with the Italians, drove the British to the frontier during March and April of 1941. Apart from the Battle of Salum in June, the front was relatively quiet, until the second British offensive (fourth campaign) in November 1941 again carried them to El Agheila, only to be pushed back by a heavy counterattack (January 1942) to the Gazala-Bir Hacheim line. In May of this year, Rommel attacked (fifth campaign) and forced a British retreat to the present Alamein positions.

In all this fighting, no clear-cut decision has been reached. Despite Axis domination of most of the Mediterranean, Britain still holds the Middle East, since a reinforced Eighth Army, massed on the short Alamein line, blocks Rommel's path to the Nile Delta.

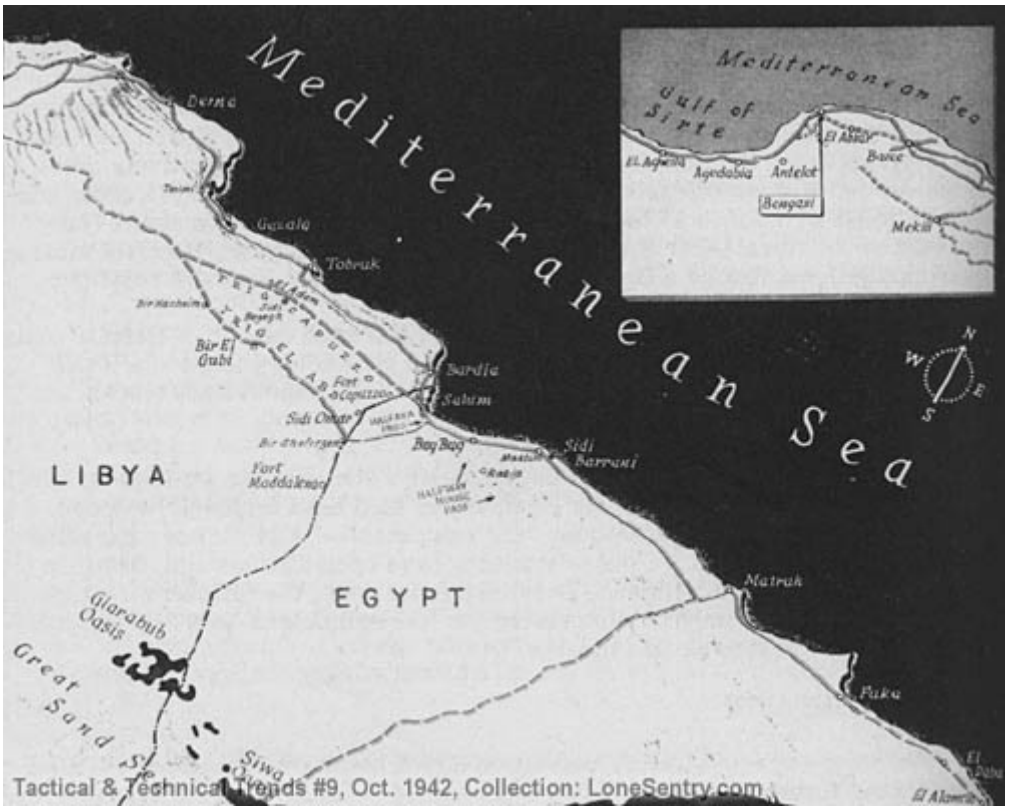
The desert has not only been the scene of a struggle for strategic control of the Mediterranean and the Middle East; it has also been a closely watched proving ground for tactics, techniques, and equipment--"a tactician's paradise and a quartermaster's hell." These subjects have been discussed in detail in this and other Military Intelligence Service publications; the following resume of the fighting is intended only to summarize the five campaigns as a background for the future operations in this theater.

THE FIRST CAMPAIGN

The long-expected Italian assault on Egypt began on September 14, 1940. The advancing forces consisted of two mechanized columns of light and medium tanks heavily supported by artillery. The campaign, however, was of the nature of a British withdrawal rather than an Italian advance, and Salum, Buq Buq and Sidi Barrani were occupied by the Italians in a few days and without heavy fighting. Apparently the need for additional preparations prevented Graziani from attempting to push on to the next logical objective, the British railhead at Mersa Matruh.

THE SECOND CAMPAIGN

Forced to stop at Sidi Barrani, Graziani disposed his troops as follows: the 1st Libyan and 101st Blackshirt Divisions occupied Sidi Barrani itself and positions about 15 miles east of it. The 2d Libyan Division occupied positions extending some 16 miles south of Sidi Barrani, while the 63d Metropolitan Division covered the escarpment from a point north of Rabia westward for about 18 miles. The 62d Metropolitan Division occupied Fort Capuzzo and, with the 104th Blackshirt Division, Salum.



Either the Italians assumed their defensive positions to be only temporary, or else they showed a rather naive concept of fortifications and security measures. All camp perimeters were clearly marked by loose stonewalls about 2 feet high with a 2-foot trench in front. Little barbed wire was used, and along the perimeters, in line, were strung the rifles, mortars, machine guns, antitank guns, artillery, and grenades. Defense in depth, mutually supporting fire, outposts, and patrols were all lacking. Troops, stores, and equipment were kept inside the perimeter.

British troops, consisting of the 7th Armored Division (including two tank brigades and a support group) and the 4th Indian Division (3d and 11th Indian Brigades and 16th British Brigade), prepared to attack. The objective was to isolate and destroy all Italian troops east of a gap between the escarpment and the southern positions of the 2d Libyan Division. On December 9, 48 infantry tanks, followed by the 3d Indian Infantry Brigade on trucks, moved in against the northwestern perimeter of the southern positions at 0800. Although the British tanks met heavy defensive fire, they broke through the perimeter into the middle of a group of 25 Italian tanks, which they managed to neutralize. Indian infantry moved in after the tanks, proceeded to mop up, and captured about4,000 officers and men. By afternoon, infantry tanks and the 11th Indian Infantry Brigade had moved north and captured 7,000 more prisoners in other positions south of Sidi Barrani.

The next British move was a direct assault on Sidi Barrani itself, executed by the three brigades of the 4th Indian Division from the south and southwest, and the 4th Armored Brigade from the west. A simultaneous move on Maktila was made unnecessary by the withdrawal of its garrison into the Sidi Barrani fortifications.

The attack was highly successful; the British captured 15,000 officers and men, while the 7th Armored Brigade and Support Group moved to the vicinity of

Buq Buq, where operations against retiring Italian columns took 12,000 to 14,000 more prisoners.

Italian columns were attacked during the 12th by British tanks and armored cars, while the infantry of the 4th Indian Division spent most of its time attempting to handle the flood of prisoners.

Positions around Rabia were being abandoned, and the retreating Italians poured into the frontier defenses of Halfaya, Capuzzo, and Salum. RAF fighters attacked the retiring enemy while bombers dropped heavy loads on Bardia and Tobruk. At the frontier, the enemy defenses stiffened, and the Italian Air Force began effective action against the advancing British. Salum was taken on the 13th, however, and on the 14th, British armored-car patrols of the 7th Armored Division and the Free French bypassed Bardia to cut the coastal road to Tobruk.

Bardia was still intact, except for damages from heavy bombing, and on the 16th the Italian frontier forces withdrew into its defenses, after evacuating their remaining positions in the Salum-Capuzzo-Halfaya area. From the 17th to the 21st; the 7th Armored Division and the Support Group moved to reinforce the patrol on the Tobruk road and to prevent a retreat from Bardia.

Bardia itself was fortified by three belts, consisting of a number of mines, concrete bunkers, and tank traps in addition to the familiar loose stone walls of the Sidi Barrani fortifications. While the foremost mobile British units began the encirclement of Tobruk, and the RAF bombed Bir el Gubi, Gazala, Tmimi, Derna, and Tripoli, the British prepared to assault Bardia. Elements of the 7th Armored Division blocked the road from Bardia to Tobruk, and the 16th British Brigade, plus the newly arrived Australians, attacked the southern perimeter at dawn on January 3, while the Support Group of the 7th Armored Division contained the western defenses. Because of the stronger antitank defense, infantry and engineers preceded the tanks in the attack. Different sectors surrendered individually, but it was not until January 5 that the last Italians in the coastal area stopped fighting. Total prisoners for the operation amounted to 32,000 men.

British forces were already being reduced by withdrawals to Greece, but the British decided to push on. The Bardia attack had proved successful, and the same tactics, preceded by the reduction of outposts outside the actual perimeter, brought the fall of Tobruk. The British captured 20,000 Italians at the capitulation of that city on January 21.

The campaign's high spot came, however, on February 4, when the 7th Armored Division made a 150-mile dash from Mekili to Antelat, completely surprised the Italians retreating from Bengasi, and decisively defeated them. The campaign ended with the occupation of El Agheila a few days later.

THE THIRD CAMPAIGN

The advance elements of the German Afrika Korps debarked at Tripoli on February 12, and it soon became obvious that an offensive would be undertaken against the weakened British forces.

By March 31, when the Axis offensive actually started, British forces in Cyrenaica consisted only of about 40 armored cars, one armored brigade of 75 tanks (of which two-thirds were obsolescent light tanks or captured Italian tanks), 5 battalions of infantry, 3 weak regiments of light artillery, and a few antitank and antiaircraft guns--hardly a force to meet the threatened Axis offensive. When the Germans struck with a frontal attack on the forward British infantry positions in the north, and an enveloping attack along the edge of the salt marshes in the south, the British were forced to withdraw through Antelat

to a position about 30 miles east of Bengasi. In addition to fighting rear-guard actions, the British had to contend with the difficulty of providing transportation from an extremely limited supply of trucks.

Communications had also broken down, and the armored brigade, as well as the 3d Motorized Indian Brigade in the vicinity of Mekili, was out of contact most of the time with headquarters. By April 6, German armored columns were advancing on the British left flank, where they engaged the Indian Brigade and threatened to outflank the main British force. The armored brigade had not arrived to reinforce the Indian brigade as planned, having followed the main body of British troops on to the coastal road; the Indian Brigade was defeated, and with the left flank gone, withdrawal all the way to the frontier was undertaken.

The withdrawal continued until the Axis forces had taken Salum and Halfaya Pass, leaving only an isolated Tobruk in the hands of the British.

THE BATTLE OF SALUM

The Axis attitude of passive defense, and reports of substantial withdrawals of German air strength from the Middle East, led the British into a decision to attack on June 15, 1941, in an attempt to destroy the German and Italian forces in the frontier area and relieve the besieged garrison of Tobruk. The British units available for this attack were considerably weaker than the total German and Italian forces in the Tobruk and frontier sectors, particularly in tanks and antitank guns. However, it was hoped that the Axis frontier defenses would be destroyed before reinforcements from the Tobruk area could be brought up. The British attackers were divided into three main groups: a Coastal Force, consisting of a brigade of Indian infantry, one platoon of tanks, an antitank company, and one regiment of light and medium artillery; an Escarpment Force, composed of an armored brigade, a battalion and a half of infantry, a regiment of field artillery, and antiaircraft and antitank units; and, third, an armored brigade group supported by a brigade of infantry. The first of these forces was to attack the Halfaya Pass position from along the coast, below the escarpment. This attack was to be supported by a portion of the Escarpment Force (second column) from above. The third column, with the remainder of the Escarpment Force was to move on toward the fortified positions along the border and then attack Fort Capuzzo and Salum.

Except for the failure of the Coastal Force to capture the Halfaya Pass position, the British plans for the initial phases were carried out successfully. The Escarpment Force, made up of the 4th Indian Division and a tank brigade, with other units attached, proceeded to the wire fence at the Libyan-Egyptian border and launched successful attacks on small fortified areas and on Fort Capuzzo and Salum. The 7th Armored Brigade and the Support Group protected the left flank of the 4th Indian Division as ordered. The 7th Armored Brigade, however, was driven out of its position in the northwestern sector by superior numbers of tanks of the 15th German Armored Division, and the Support Group in the southwestern sector was outnumbered by the motorized and armored forces of the 5th German Light Motorized Division, which included a battalion of 86 tanks.

Threatened with an enveloping movement against his weakening flank, the commander of the 4th Indian Division was forced to withdraw in order to prevent his lines of supply and communication from being cut. The decision to withdraw was also influenced by the fact that the Coastal Force on the right flank, in spite of determined assaults, had been unable to take the Halfaya Pass position and join the forward units. The withdrawal was completed on the night of June 17. The Axis forces did not pursue the retreating British, probably because the opening of the German offensive against Russia was only 5 days off.

THE FOURTH CAMPAIGN

By the middle of November, the British Eighth Army had accumulated the requisite strength for an offensive, and on the night of November 17-18 the British 7th Armored Division, the 1st New Zealand Infantry Division, and the 1st South African Division (less one brigade) crossed the frontier wire to attempt an enveloping movement against the German armored troops lying between the Axis-held Salum area and the British fortress of Tobruk. The 4th Indian Division was given the mission of containing the Axis forces in the heavily defended frontier triangle, which included Bardia, Sidi Omar, Salum, and Halfaya Pass. From the 19th to the 23d, Axis and British tanks (including one brigade of 166 light U.S. M3's) battled to gain armored superiority, while the Tobruk garrison began, on November 21, to fight its way out of the ring of Italian infantry in an attempt to make contact with the British armored and infantry forces in the Sidi Rezegh area.

On the first day of fighting, November 19, the British 22d Armored Brigade successfully engaged the Italian Ariete Armored Division at Bir el Gubi. Meanwhile, the 7th Armored Brigade and 7th Support Group moved toward Sidi Rezegh, and the 4th Armored Brigade, with American tanks, engaged strong German tank units halfway between Bir el Gubi and the Omars. This dispersion of British armored forces was, perhaps, the most serious mistake of the campaign, for it enabled Rommel to strike the British units in detail and thus neutralized the initial British numerical superiority. By the night of November 21, the British tank units had been brought together at Sidi Rezegh, but by that time they were so depleted that the concentration brought little striking power.

During the tank actions, the 1st New Zealand Division had moved north and northeast, around the Omars, into Fort Capuzzo on November 20, and on to the Tobruk-Bardia road the next day. One brigade was left behind to contain Bardia, and the remainder of the division started to fight its way along the coastal road toward Tobruk, where they were to assist the garrison's attempt to break out.

The 4th Indian Division, in the frontier area, attacked and reduced the fortified Omars position on November 22. One infantry brigade, two squadrons of heavy infantry tanks, and most of the division artillery, used in the action were which netted much Axis materiel and equipment, and about 3,600 prisoners.

At the end of the armored battles, the Axis armored units were also heavily depleted; two days were spent in harrassing activities, until, late on the 24th, Rommel gathered all his remaining tank strength and made a drive toward the Omar-Sheferzen area. This seriously disrupted the British rear-area installations and caused a great deal of confusion, although few casualties resulted. Inconclusive actions continued throughout the next few days while the British brought in tank reinforcements and made repairs.

Finally, on November 26, the New Zealanders made contact with the Tobruk garrison, causing Rommel to withdraw his tanks to the north in an attempt to separate the Sidi Rezegh and Tobruk forces, which he did on December 1 and 2. More British reinforcements arrived, however, and, as the Indians and South Africans mopped up isolated resistances in the battle area, the strengthened 7th Armored Division renewed activities against enemy tank and infantry units.

It became obvious by December 6 that Rommel was withdrawing to the west, where he attempted to establish fortified positions: first, between El Adem and Bir el Gubi; and a few days later, in the Gazala area. These were finally reduced by December 16, and the Axis troops continued to withdraw, fighting successive rearguard actions until finally on January 7 the British occupied Agedabia.

On January 2, the 2d South African Division had made a highly successful tank and infantry attack on the isolated Axis troops in Bardia, taking 8,500 prisoners and liberating 1,150 British troops. A short time later Salum, and then Halfaya Pass, fell to the South African infantry after the isolated and weakened garrisons had been subjected to extensive and heavy bombardment by artillery and air.

The British 22d Armored Brigade had suffered heavily at Agedabia on December 28, and when the 2d Armored Brigade was defeated near Antelat on January 23, the position of the Eighth Army in the Bengasi area became untenable, and General Ritchie decided to withdraw to the east. There the British set up a mined and fortified line extending from Gazala to Bir Hacheim and started to build up strength for a new offensive. Axis troops also prepared for renewed attack, and little activity took place until the fifth campaign started on the night of May 26.

THE FIFTH CAMPAIGN

With his mobile Afrika Korps, Rommel moved around the fortified position of Bir Hacheim to attack the British armored units in rear of their minefield. Both of the German armored divisions and the 90th Light Division were used in the complete envelopment. The Italian Ariete Armored Division and Trieste Motorized Division halted at the southern end of the minefield to attack Bir Hacheim on the morning of May 27. The British, who had been led by extensive Axis demonstrations to expect a frontal assault in the northern sector, were not entirely prepared for the flanking attack; the 4th Armored Brigade, one motorized infantry brigade, Headquarters of the 7th Armored Division, and some elements of the 22d Armored Brigade were struck in detail by the German columns before they could be concentrated to repulse the attack.

The 1st Free French Brigade at Bir Hacheim successfully repulsed the initial Italian attack, destroying some 30 to 50 enemy tanks.

During the next few days, heavy fighting continued east of the British positions, and slowly the British pushed most of the German armored forces against the rear of the minefields. By May 29 the supply situation of the Axis armored forces was growing acute, for the RAF, the 7th Support Group, and Free French at Bir Hacheim were effectively neutralizing all attempts to move supplies around the southern flank. Although the Italian Trieste Division had managed to open two small gaps opposite the armored concentrations in the Knightsbridge area, the British were moving to close this gap and did not feel that such narrow corridors could be effectively used for supply.

The Germans, realizing the necessity for opening an adequate route through the minefields, circled their armored forces in the so-called Cauldron with a number of antitank guns, and, turning their back to the British armored forces, they effectively attacked and destroyed British infantry units attempt to close the gaps. It would seem logical for the British to have struck the Axis armored forces from the rear with all available strength while this action was going on, but the British attack was delayed, and the initial gaps were widened the point where they could be used for supply.

Indecisive fighting now took place for the next few days while the Germans first withdrew to the west through the gap, and then returned.

The next major action was the assault on Bir Hacheim. During the first week in June this position had been subjected to increasingly severe attacks by the Italians and some units of the German Armored Forces. Stuka dive bombers, heavy artillery (up to 210-mm), and concentrations of tanks were now used in an effort to reduce the fortifications. Realizing that this former flank position was no longer of any value to the British, General Ritchie gave orders on

June 10 that it be abandoned. Heavy casualties resulted during the difficult evacuation, and by the time the Free French rejoined the British units only one-half remained of the original garrison of 5,000.

With the fall of the Free French position, the Germans units immediately fanned out in rear of the British, who were now forced to withdraw. The 1st South African and 50th British Divisions in the north were to be withdrawn along the coastal road to Tobruk, and all available British armored units were detailed to protect the southern flank for this withdrawal. This defensive line stretched from the Knightsbridge "box'; held by the 200th Guards Brigade, to El Adem.

By this disposition, British armored units were tied down along an extended line and deprived of their mobility. This gave Rommel his chance to achieve a much-needed numerical superiority in tanks.

The British tanks attacked at dawn June 12, moving south from the escarpment. The groups of German tanks, however, successfully drew the British armor onto the 88-mm and 50-mm guns which were hidden in practically every small wadi, and among groups of derelict vehicles. After losing a number of cruiser tanks and American mediums, the British withdrew to their previous line along the escarpment. The Germans, attempting to conserve their own tanks, did not attack, but successfully brought their antitank guns within range of the British by sending forward one or two tanks which would weave back and forth and create a cloud of dust behind which the antitank guns were brought up. After the dust settled, the antitank guns would open fire at ranges of 1,000 to 1,400 yards. In firing at the American mediums, Axis guns concentrated on the vulnerable tracks and suspension system.

In addition to these new tactics, the Germans continued to lure British tanks onto emplaced antitank guns by sending forth small motorized infantry units as bait.

During the night the British tanks withdrew from the escarpment across the Trig Capuzzo, and took up positions before Acroma which they were to defend from direct Axis attack as long as possible.

On June 13 the battle continued, while the Guards Brigade evacuated the Knightsbridge box and took up positions near Acroma. The tank battle continued throughout the day with the Axis utilizing antitank guns rather than their armor; by the end of the day the British had lost all but 65 of the 300 or more tanks with which they had started on the day before.

In addition to these intensive ground operations, Axis dive-bombers attacked the British battle positions almost continuously during June 12.

The British were now forced to withdraw at least to the Libyan-Egyptian frontier, but after some debate it was decided that an attempt should be made to hold Tobruk. The situation, however, was not exactly comparable to that of the previous year when Rommel first pushed south of that fortress and isolated it. Because of a greater Axis control of the Mediterranean, the Royal Navy could no longer undertake to supply the port, and the German and Italian land forces were strong enough this time to make a determined assault on the fortress. In Tobruk were left the 2d South African Division, the Guards Brigade, the 11th Indian Brigade, one Brigade of the 1st South African Division, and at least five regiments of artillery. The main body of the British Eighth Army withdrew to the frontier.

Advance elements of the 90th Light Division pushed on toward Bardia and Sidi Omar; the main German and Italian forces prepared to assault Tobruk. The

attack was preceded by intense dive-bombing and artillery preparation, and on June 20 Axis troops penetrated the southern sector; a few hours later a larger force pushed into the city itself through the Derna-road gap in the minefields. The surrender has been reported to have come some time in the middle of the morning, but many British units continued to resist, and the attacking forces did not reach the harbor area until the middle of the afternoon.

With Tobruk gone, the main Axis forces pushed on toward the British frontier positions, and after brief fighting in that area the British decided to withdraw to Mersa Matruh where, reinforced by the New Zealand Division, they hoped to be able to make a stand.

On June 26 Rommel's two armored divisions and the 90th Light Division pushed in the British covering forces and prepared to encircle and attack Matruh. Again the British decided that the impending encirclement presented too much danger, and, now under the direct command of General Auchinleck, what was left of the Elghh Army withdrew to the present position on the El Alamein line. Some British units were captured in the Matruh evacuation. By June 30, both sides had reached a line extending from El Alamein to the Qattara Depression. Heavy fighting raged along this line for several days, but because of stiffened British resistance and the Axis drive's loss of momentum, Rommel failed to advance further.

Since that time intermittent fighting to gain control of the "hills" of the position has taken place but neither side has attempted an all-out offensive.

NOTES ON ITALIAN ORGANIZATION

a. General

It should be appreciated in connection with all Italian tables of organization that, although rigid in intention, they are continuously changeable in fact. At increasingly frequent intervals, regardless of the fact that the last promulgated new establishment has not yet been brought wholly into effect, the Italian War Office produces another organization which is itself in most cases fated to be realized only on paper. The intentions, under the ever greater influence of German tactical ideas, are usually good, but owing to lack of the necessary equipment and to the usual bureaucratic confusion the army is generally content with an approximation of the effect intended.

b. Divisional Organization

The main point of interest about Italian organization is that the infantry division has only two infantry regiments. Reorganization in the so-called "Binaria" division (organization begun in 1926 and largely completed by 1935) was intended for the kind of warfare in which, on the official theory, Italy would be exclusively engaged--a war of rapid movement and quick decision. This Italian hope, based mainly on the fact that the Italian resources are insufficient for a long war, has not been fulfilled, and in practice the system has been found to have the serious defect that it leaves the divisional commander no reserve. Particularly in the hard-fought Albanian campaign was it noted that after a division had been involved in active operations for any time, and sometimes even after only a week, it had to be withdrawn from the line to refit. In some cases where a withdrawal was impossible, elements of one division were simply incorporated in another; this has also occurred in Africa in the case of the Bologna and Sabrata divisions. All Italian divisions in Africa were drastically reorganized in the spring of 1942. The main features of the reorganization are increased artillery and the inclusion of support and antitank weapons within the framework of infantry units.

c. "Groups"

Another feature of Italian organization which is worthy of mention is the passion for forming "raggruppamenti," or groups. This is a method of providing, for instance, a headquarters and administrative detachment for various independent batteries of artillery which are meant to operate together. Another example is provided by such formations as the "Raggruppamento Celere Africa Settentrionale" or "RACAS" (North Africa Mobile Group) which is a force of armored cars, mechanised infantry, portee guns and light tanks. The use of "raggruppamenti" is evidence of the Italian bent for improvisation and the desire to break the back of a rigid system of tables of organization.