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CONTENTS

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SECTION I

AIR

1. THE PRESENT VERSION OF THE FW-190

Some interesting modifications have been reported from examination of crashed Focke-Wulf 190s, used as fighter-bombers.

The engine is the fully rated BMW 801 D-2, equipped with doping pipes running to each of the 14 cylinders instead of only to 7 as in the previous model. This system is used to increase the power of the engine for a limited time during an emergency. The tank for the doping of gas or fluid is removed from the cockpit to behind the seat, and is of larger capacity, presumably in order to effect the doping of all 14 cylinders. The three fixed louvers at each side of the rear end of the engine cowling on the original design have been replaced by three adjustable gills, which are controlled by a small rotating handle on the upper instrument panel.

Various armament combinations have been found on FW-190s. The original aircraft had as regular equipment two 7.9-mm machine guns mounted above the engine and two MG-151 20-mm guns mounted in the wing roots, all four firing through the propeller arc, and two outboard Oerlikon FF 20-mm cannons. Recent crash reports from England have not included the outboard cannon in the armament. The reason for the omission of the Oerlikons has not been given, but it is possible that the use of these cannon was either experimental or limited to special types of operations. In one crashed plane, only the MG-151 20-mm guns were found, the 7.9-mm machine guns having been removed from the mountings, and the firing channels in the top of the cowling having been blanked off.

A bomb carrier labeled E.T.C. 501 is mounted under the center line of the fuselage. This can carry either a 550- or 1100-pound bomb. There is no fairing around the carrier, but long streamlining is fitted behind, stretching far back along the underside of the fuselage.

The armor, which appears to be unchanged, consists of a 13-mm steel plate behind the head and shoulders of the pilot, 8-mm armor back of the pilot's seat, strips between the seat and the sides of the fuselage, 5 or 6 mm thick, and a bullet-proof windshield 1 3/4 inches thick. The engine is protected by the foremost ring of the engine cowling, which is 5-mm armor, and by a second ring, of 3-mm sheet steel. The bullet-proof glass windshield is fitted with a gasoline spray which can be turned on by a small control on the lower instrument panel. This spray washes away oil that may be deposited on the windshield from the engine.

The normal fuel tanks are now of the fully flexible type, with a capacity of 139 U.S. gallons, and, in addition to these, there are two jettisonable fuel tanks carried under the wing, each holding 80 U.S. gallons. These are jettisoned mechanically by pulling a small T-shaped handle in the cockpit.

Modifications have been made to the airframe, but the main dimensions are unchanged. There is internal stiffening in the wings and in the rear end of the fuselage. The new type of boost gauge, already found in the Do-217, is fitted, and

also a modified fuel-flow indicator for the two main tanks and the outboard jettisonable tanks. A red bulb above the indicator lights when the fuel supply is down to 20 minutes flying. There is a fitting for a small camera in the rear part of the fuselage. The oxygen bottles are of a new spherical type.

Apparently certain faults were found in the design and manufacture of the electrical equipment in the original FW-190s, and these findings resulted in some gradual changes. The plywood top of the fin has now been equipped with an 8-inch aerial mast of the same material, altering the appearance of the top of the fin and shortening the aerial. The radio installation used with the short aerial is a very light type of FuG 16 Z with a remote-control frequency selector.

It is believed probable that an improved version of the FW-190 may shortly appear, re-engined with a BMW 801 E or the 801 J with an exhaust-driven supercharger, which would necessitate considerable modification of the air-frame design. Further development will mainly depend on whether the new engine has 18, 21, or 27, cylinders. Such a redesigned airplane is likely to have a much higher performance. An attempt may be made to improve the speed and climb of the 190, which at present decreases rapidly above 25,000 feet. The MG-151 20-mm guns may be replaced by a larger caliber type, such as the reported 25-mm Rheinmetall. Major improvements of performance and load-carrying capacity are to be expected only with a new type of power plant. The aircraft may be developed chiefly as a fighter-bomber.

2. RUSSIAN ATTACK AVIATION

The following is a condensation of an article by a Russian Colonel, published in the official Soviet newspaper, Pravda, January 5, 1943.

The tactical employment of attack aviation as described in this article appears sound, although overemphasis may have been laid on "dive-bombing." Employment of dive-bombers in the face of heavy ground fire and strong enemy interceptor opposition has proven too costly to maintain in other theaters of operation. The Russian attack plane, the "Stormovik," or "Sturmovik," is, however, believed to be very heavily armored, and consequently may be fully capable of performing the function of attack aviation by purely dive-bombing methods. This plane is equipped with three racks under each wing which carry rocket bombs. These rockets, though not wholly perfected, are reported to have been particularly effective in knocking out German tanks by air action.

The article follows.

* * *

The Red Air Force standard attack plane ("Sturmovik") has proved highly successful and is improving with the development of each new series.

Attack planes operate under all weather conditions except fog. Rain, snow, ceilings under 150 feet, or visibility as low as 1 mile do not deter attack aviation from carrying out its missions. Under such conditions, bombers cannot operate and attack airplanes must be used to wipe out enemy personnel and materiel.

When enemy long-range artillery keeps Red Army units from moving up their reserves, the attack planes search out the enemy positions and silence his guns. When Soviet infantry cannot move through narrow, exposed defiles, the attack planes bomb the enemy mortar positions and machine-gun his personnel. Off the battlefield, the attack plane is employed principally as an assault weapon against enemy infantry and motorized columns. Attack planes usually operate with a fighter escort, but, when the ceiling is low, they operate independently at low altitudes. Close formation flying and good radio communication are important factors in providing mutual protection against enemy fighters.

In the beginning of the Soviet-German war, attack planes operated only at low altitudes. The more conservative senior officers concentrated mostly on the advantage of surprise attack. They thereby automatically excluded one of the most powerful air weapons, bombs of all calibers with instantaneous fuzes, since with this tupe of fuze it was impossible to gain the necessary altitudes before the bombs detonated. On the other hand, experimenting in combat, it was ascertained that bombing from too high an altitude affected accuracy. Dive-bombing by attack planes proved to be the successful solution. In other words, it is necessary to change to air tactics which prove successful, and to leave conservatism behind.

Because of the variety of missions assigned to attack aviation and the fact that the pilot flies alone, he must be versatile. He must be able to fly his plane, navigate to his target, drop his bombs, fire his cannon and machine guns on small targets, and return to his airdrome. He must know the organization and dispositions of his own troops, as well as the terrain over which he operates. In addition he must have perfect knowledge of the plane in order to control it close to the ground against the heaviest antiaircraft fire and against surprise attack by enemy fighters.

The attack pilot must therefore possess the courage of a pursuit pilot, the aim of a bombardier, the experience of a qualified navigator, and the skill of a long-range reconnaissance pilot. No aviation school can train a student to be expert in all these lines; thus, it is necessary for the pilot to augment his flying education in combat. Experience has proven that the axiom "the more difficult the training, the easier the combat" is especially true of attack pilots. It is imperative that experienced officers keep close check on new pilots. If one of the latter demonstrates any particular weakness, he must be given additional training along that line. If he bombs poorly, he must be immediately put on the "polygon" bombing course; if he has trouble orienting himself in a certain region, he must fly in a training or observation plane until he is thoroughly familiar with the terrain, etc. He must be taught to change his tactics quickly when necessary, by drawing on experiences of his own and of others.

ANTIAIRCRAFT

3. GERMAN SEARCHLIGHTS

In World War I, searchlights were occasionally used to locate intruding aircraft, but they were not sufficiently coordinated with air defense to cause enemy pilots much concern.

In the present war, the use of searchlights in belts, clusters, and circular groups is a part of the complex defense system that the Germans have devised to offset the effectiveness of massed assaults by Allied bombers. The organization of German searchlights and guns is on a regional basis. Each region controls the permanent flak defenses, fighter units, reporting system, balloon barrage, and civil defense. The Germans have organized their searchlights well and use them effectively for illuminated target fire with their gun defenses (see Tactical and Technical Trends, No. 6, p. 6).

Searchlight belts were first seen in Germany in March, 1941. The most extensive belt had an enormous number of searchlights, but no flak. It was solid light and extended 10 to 20 miles in depth, its sole purpose appearing to be the direction of GAF night fighters to the enemy bombers. This belt was discontinued in May, 1942, probably because it was not sufficiently effective to justify such a heavy concentration of lights and operating personnel. However, searchlights which were employed in cooperation with flak had obtained some considerable measure of success, as they tended to impede accurate navigation of Allied planes and subjected their crews to considerable strain en route to and from their objectives. Concentrations or groups of 10 to 15 and 20 to 40 lights were found in fighter-protected areas, on the approach lanes to important targets, and in gun-defended terrain. Batteries of two or three lights, set 25 to 75 yards apart, have also been seen.

Last November, searchlights appeared in the form of circular groups of 15 to 30 lights, the majority of which were controlled by master lights. The master light, which has a bluish tint due probably to the small divergence of beam and the very high current used, picks up the aircraft, and then the cone of light produced by the group centers on the master light and moves with it. The accuracy of the master light suggests that it is controlled either by some form of radio detection device or by a particularly efficient system of sound location. However, unless the remainder of the lights in the group promptly expose and illuminate the plane, they can often be avoided by an immediate change of course or speed. Each cone unit is coordinated with a larger number of antiaircraft guns. Spaced between the various cone groups, there are individual lights searching for the planes. When a plane is in focus, other beams join the first and hold the aircraft until the cone can pick it up. At heights up to 18,000 feet, 15 to 30 cones give very good illumination, and they are particularly effective in directing flak between 5,000 and 14,000 feet.

Until the aircraft is firmly held, searchlights are either radio-detector-controlled or controlled by sound. If the searchlight follows a rapid change in course, it is usually radio-detector-controlled. If it gropes for the aircraft and cannot follow rapid changes, it is probably sound controlled. Many of the lights

now search independently. When the plane is spotted, searchlights using visual remote control concentrate on it to form a cone.

Searchlights used independently of flak have several purposes. They silhouette planes so that night fighters can see them more easily; indicate the track of attacking planes to night fighters, antiaircraft units, and searchlight-cone groups; dazzle bomber crews so they cannot see fighters or targets; hide targets from view by concentrating a cone of light over them; and counteract the effect of parachute flares by placing a cone of light under the descending flare.

A single searchlight may indicate the track of an Allied bomber by pointing at it vertically and then moving horizontally in the direction of its course. It may also focus on a point in advance of the bomber's estimated course, and, perhaps, wave in the direction of flight. Circles are described around the plane to indicate its presence and track, and to invite other individually controlled searchlights to focus on it until it can be transferred to a cone. Successive pairs of lights, directed one on each side of the plane and forming a lane, may indicate the path of the bomber. Sometimes a wall may be formed to silhouette the attacking plane for night flighters flying at the same level. The projection of light patches on a cloud below the aircraft silhouettes them to overhead fighters and a cone may similarly be used as a background.

The dazzle effect of the light is greater in a haze than in clear weather. Lights may sweep horizontally to dazzle crews, making it difficult to see the target. A single beam cannot produce a "dazzle" effect except at short range, but concentration of several beams can cause acute difficulty to the pilot or bombardier. It can occur only when the aircraft is directly illuminated, and, although effective up to 15,000 feet, is most pronounced between 2,000 and 4,000 feet. "Glare" can be very effective on nights where there is considerable ground or industrial haze. The searchlights sometimes project beams at a low angle of elevation onto the haze, producing a pool of light over the target and making identification difficult for bombing crews. Both dazzle and glare interfere with night vision, make the location of targets difficult, lessen bombing accuracy, and help night fighters to approach the enemy bombers unobserved.

A recent analysis of searchlight operations led to the following conclusions: German antiaircraft defenses rely mainly on unseen methods of control but augment their fire by visually controlled guns, using searchlights only when there is little or no cloud. Among aircraft coned by lights for more than 20 seconds (and therefore probably engaged visually), the percentage damaged has been about twice as high as among planes illuminated for a shorter period. There was no evidence that those coned for more than 20 seconds were subjected to more intense antiaircraft fire than others. The risk of being illuminated by searchlights seemed to be about the same at all bombing altitudes (6,000 to 20,000 feet). On one occasion when conditions were favorable for searchlights, there were 70 to 80 bombers over a target at one time and they were effectively coned (i.e., for more than 20 seconds) at the rate of about one per minute. Heavy antiaircraft fire in coordination with searchlight cones is extremely accurate and destructive. Once a cone centers on a plane, it ignores all other aircraft and proceeds methodically to direct the destruction of the one it has caught.

4. THE SPOTLIGHT ANTITANK LAYING TEACHER

This particular apparatus can be adapted to any equipment for training in antitank shooting.

The following description, and the accompanying sketches taken from British sources, are based on the adapting of a "mock-up" 2-pounder (40-mm) antitank carriage which had originally been fitted with an aiming rifle and telescope. The apparatus, however, can be modified to fit on the barrel of a 2-pounder gun or any other equipment to suit particular circumstances.

The spotlight device consists of a flat metal bar on which a tube is mounted with a lamp box fitted at the rear end. The box houses a 6-volt bulb, and its inner face is pierced with a pin hole to allow the light to pass through the center of the tube. The tube is adjustable for deflection and elevation.

The opposite end of the tube is provided with an adjustable carrier fitted with a lens; by this means the spotlight is focused. Any suitable lens available, can be used. The length of the tube should be such that the distance from pin hole to lens is approximately equal to the focal length.

Two press switches should be included in the circuit in parallel, one operated by the firing mechanism and one by the instructor. The details of the target and the alignment of the spotlight are described below, with details of construction shown in the accompanying sketches.*

a. Target and Frame

The target frame is rectangular and is approximately 7 ft. long and 5 ft. deep, but any suitable means of carrying the target and of providing a background may be utilized. The corners are cross-battened, and wood supports are fitted to the bottom corners.

A metal rail 1 in. by 1/8 in. and about 9 ft. long is fitted between the uprights of the frame, the flat side of the rail being vertical. The rail is bent horizontally and forms a track for the target. If desirable, one end of the rail may be slightly higher than the other (say 6 inches).

Wire hooks are soldered at varying intervals along the rail to act as guides for the endless towing cord. The towing cord runs over pulleys fitted to the uprights of the frame, a winding handle being fitted at one end.

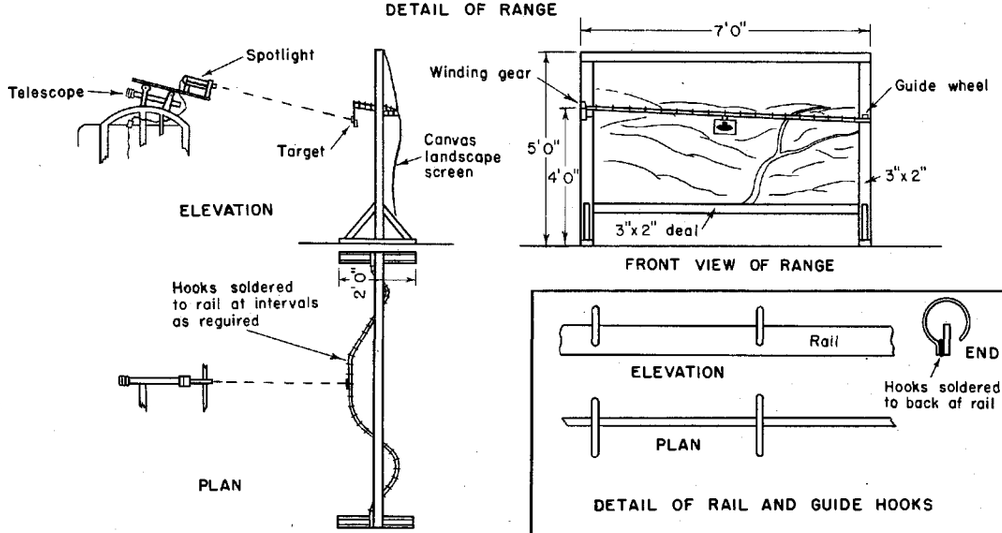
The target carrier is made from a piece of light sheet metal 5 1/2 in. by 4 1/2 in., on one side of which is mounted a model tank also cut out from light sheet metal, and about 2 in. by 1 in. by 1/2 in. when made. On the other side of the carrier a balancing weight is fitted.

*The specific materials referred to in the sketches and text, such as brass and mild steel, are not necessarily the only suitable kinds.

SPOT LIGHT ANTITANK LAYING TEACHER

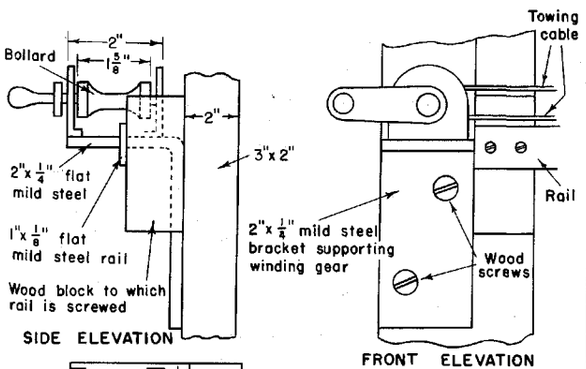
RANGE CONSTRUCTION

DETAIL OF RANGE

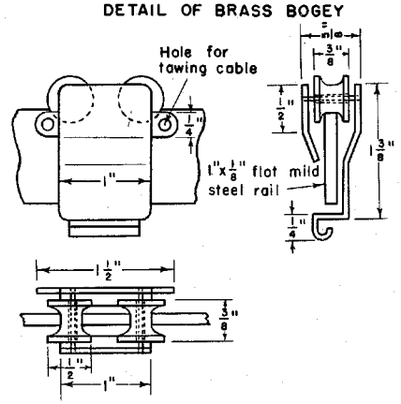


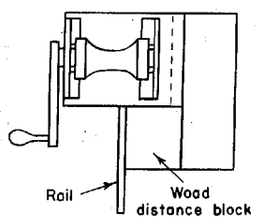
DETAIL OF RAIL AND GUIDE HOOKS

DETAIL OF WINDING GEAR

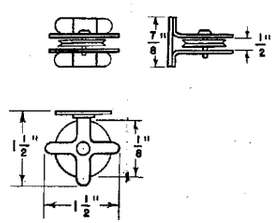


DETAIL OF BRASS BOGEY

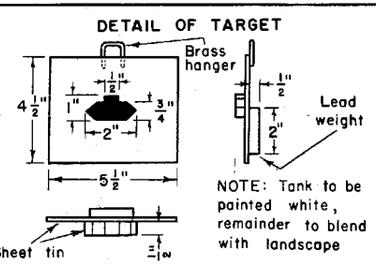




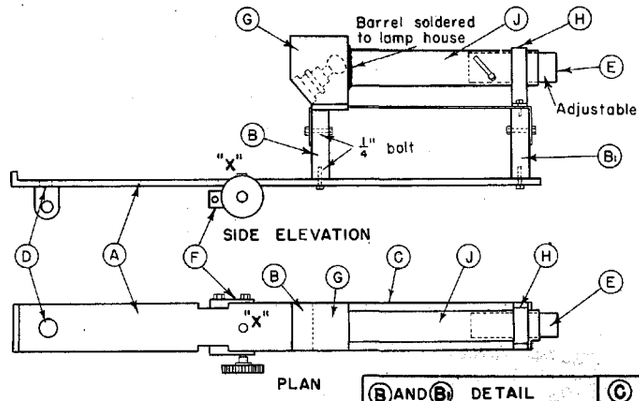
DETAIL OF GUIDE WHEEL

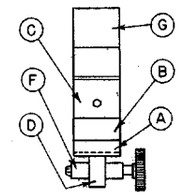


DETAIL OF TARGET



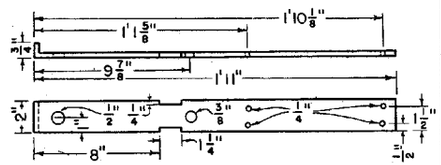
SPOT LIGHT DETAILS



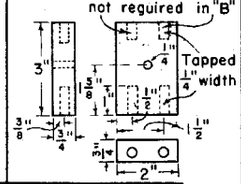


SPOT LIGHT AND CONTROL GEAR ASSEMBLY

(A) DETAIL OF PLATFORM

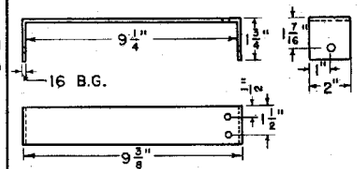


(B) AND (B1) DETAIL

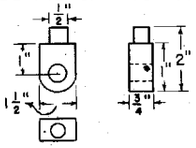


(C) DETAIL OF METAL BRIDGE

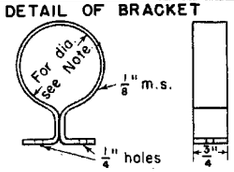
(Fits over and secured to blocks "B" & "B1")



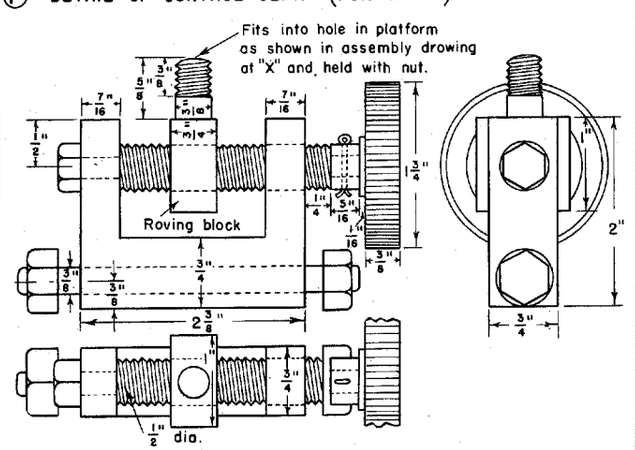
(D) DETAIL OF PIVOT PIN



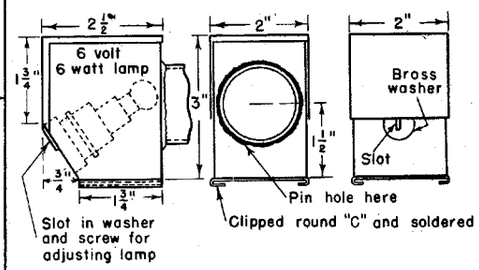
(H) DETAIL OF BRACKET

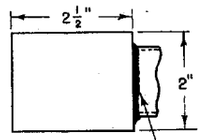


(F) DETAIL OF CONTROL GEAR (FOR "LEAD")



(G) DETAIL OF LAMP HOUSE





NOTE: Diameter of barrel will depend upon size of lens used.

The target carrier is suspended from a bogey which is pulled along the rail. The two ends of the towing cord are attached to the bogey and pass around a small winch gear by means of which the movement of the carrier is controlled.

The target carrier should be finished with light-colored paint, while the tank itself is painted white, which is the most suitable color for showing up the spot of light.

A back cloth of burlap, with a landscape painted on it, may be fitted to the rear of the target.

b. Setting Up

The spot-light apparatus is fitted on the mock-up or gun, and the circuit wired up to a battery or small transformer.

The target frame is placed about 10 feet in front of the telescope.

c. Alignment and Focusing of Spotlight

The target is moved along the rail to the point which is nearest the telescope. It should be so arranged that the tank is now at right angles to the line of sight through the telescope.

The "lead" screw should be placed in the center of its run.

The telescope is set to the chosen minimum "range," say 300 yards, and aligned on the center of the tank, by using the elevating and traversing handwheels.

The spotlight is switched on and adjusted so that the spot appears on the center of the tank and sharply in focus. This is done by moving the adjusting screw on the mounting, at the same time moving the lens carrier backwards or forwards until the spot is seen to be clearly defined and as small as possible. To obtain the best results the filament of the bulb, the pin hole in the lamp box, and the center of the lens should be correctly aligned. As the lens and pin hole are in fixed alignment, the lamp socket should be fitted in such a way as to permit of a small adjustment of the bulb to enable the filament to be correctly positioned.

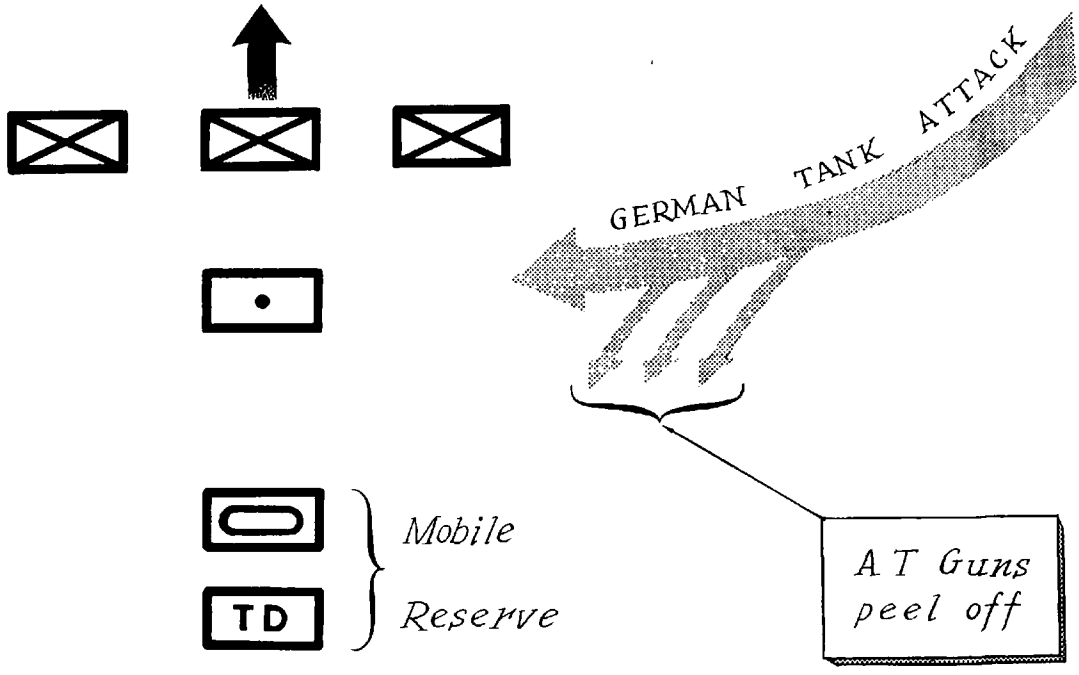
When the spotlight is focused on the tank at the nearest point, the tank is run to that part of the rail farthest from the telescope. The "range" to this point is obtained by bringing the spotlight on to the tank, using the elevating gear. The line of sight through the telescope is then brought on to the center of the tank. This will now show the "range" to the tank, which should be about 900 yards.

d. Control Gear for Lead

In use, the instructor offsets the spotlight for deflection by means of the "control gear for lead" to render necessary the application of lead when laying through the telescope.

5. GERMAN USE OF AT GUNS WITH TANKS

An American army observer in Tunisia reports that German tanks habitually operate in conjunction with AT guns, as has long been their practice. The employment of these weapons is not always the same, but when units encounter enemy tanks they should expect AT guns. One German maneuver wherein the enemy launched a flank attack with tanks against our forces is described as follows (see sketch):



As the enemy armor drove into the flank, its objective our supporting artillery and then our infantry, AT guns, including 88-mm, were "peeled off" and went into position to protect the German tanks from the counterattack of our tanks and/or tank destroyers.

On other occasions the Germans used their often-tried stratagem of sending forward a number of tanks which would then withdraw in an attempt to lure our armor into range of their AT weapons. This is the same stratagem which the Germans used with such success against the British tanks during the heavy fighting prior to the British withdrawal to the El Alamein line in June 1942.

6. DESTRUCTION OF DISABLED TANKS

All U.S. officers interviewed by an American military observer in Tunisia have emphasized the absolute necessity for finishing off a German tank that has

been disabled. One half-track of a U.S. tank-destroyer battalion, after stopping two German tanks, moved forward; as it passed one of the two disabled tanks, a German soldier turned the tank machine gun on the half-track and killed or wounded the entire crew.

Comment: In connection with the above, it should also be noted that under favorable circumstances the Germans have been quick to recover disabled tanks during the night.

ARMORED FORCE

7. NOTES ON THE PZKW 4

The PzKw 4 is the German standard medium tank. It weighs about 22 tons. With the exception of the principal armament, the more recent models of this tank embody essentially the same features. The change in armament consists of a long-barreled 75-mm gun, the 7.5-cm Kw K. 40, being fitted in place of the short-barreled 75-mm gun (see Tactical and Technical Trends, No. 20, p. 10).

The following information on the new PzKw 4 is based on a tank captured in North Africa.

a. Suspension and Armor

The tank has eight small bogie wheels, mounted and sprung in pairs by quarter-elliptic springs, a front sprocket, a rear idler, and four return rollers on each side. The track is of steel, as is usual in German tanks.

The armor probably is as follows: front, back, and turret 1.95 in.; sides 1.18 in.; back and top .39 to .79 in.* Sand bags were carried on top of the turret for additional protection from air attack. (German tanks often carry sand bags and additional lengths of track as added protection.)

b. Dimensions and Performance

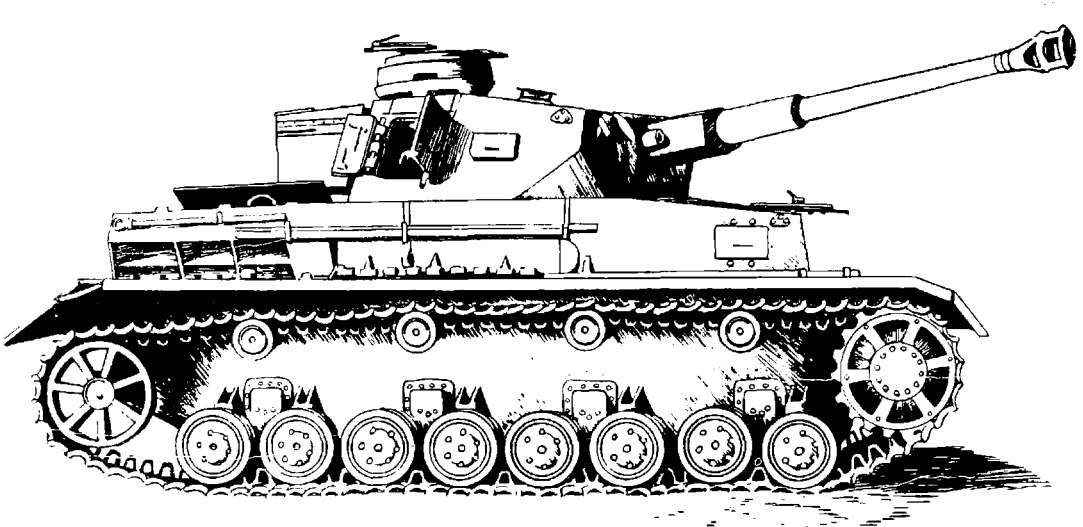
The tank is 19 ft. 6 in. long, 9 ft. 4 in. wide, and 8 ft. 9 in. high, with a ground clearance of 16 inches. It can cross a 9-foot trench, negotiate a 2-foot step, climb a 27-degree gradient, and ford to a depth of 2 ft. 7 in. The theoretical radius of action is 130 miles on roads and 80 miles cross-country.

c. Engine

The tank is powered with a Nordbau Model V-12, four-stroke, gasoline engine, developing 320 hp. It has overhead cams, one for each bank of engines,

*Later details indicate that the armor arrangement on current models of PzKw 4 is the same.

and magneto ignition. There are two Solex down-draught carburetors, and twin radiators, with a fan for each, mounted on the right-hand side of the engine. An inertia starter* is fitted. The fuel capacity is 94 gallons for the engine and 20 gallons for the 2-cylinder turret-drive auxiliary engine.



Pz. Kw. 4

d. Clutch, Brake, and Drive

The clutch is incorporated in a gear-box which is of the ordinary type with 6 forward speeds and reverse. The brakes, operating on epicyclic gears, are air-cooled and hydraulically operated. The drive is through the engine, drive shaft, clutch, gear box, bevel drive, steering system, final reduction drive, and sprockets.

e. Instruments

Instruments include a revolution counter (tachometer) to 3,200 rpm with 2,600 to 3,200 in red, speedometer to 50 kph (31 mph), odometer (mileage indicator), a water temperature gauge, and two oil pressure gauges reading to 85 lbs. per sq. in. The tank is fitted to take an electric gyrocompass on the left side of the driver.

f. Armament

The tank mounts the long-barreled 75-mm gun and two model 34 machine guns, one fixed coaxially on the right side of the gun, and the other one set in the

*An inertia starter is a starter equipped with its own independent fly-wheel to build up starting inertia.

hull firing forward. While reports vary, it is thought that the gun will penetrate 2 inches of homogeneous armor at about 2,500 yards at 30 degrees. The breech is of the vertical sliding type. Firing is electric, with a safety device which prevents firing if the breech is not closed, the gun not fully run out, or the buffer not full. The traverse is by hand, or by power from a 2-cylinder, 9-hp auxiliary gasoline engine directly coupled to a generator, which supplies current to the turret traversing motor. The turret floor rotates. Eighty-three rounds of 75-mm AP or HE and smoke are carried. Five smoke candles may be carried on a rack at the rear of the tank. These candles are released from inside by a wire cable. Twenty-seven belts of 75 rounds each are carried for the machine guns.

g. Radio Equipment

Intercommunication is by radio-telephone. The aerial may be raised or lowered from inside the tank. The set is situated over the gear box on the left side of the hull gunner. Below the 75-mm gun is situated an insulated aerial guard which deflects the aerial when the turret is traversed.

h. Crew

The crew numbers five: driver, hull-gunner and radio operator, commander, gunner, and loader.

8. GERMAN DESTRUCTION OF OWN TANKS

Toward the end of last year, one German tank regiment commander in the Middle East found that he was losing far too many tanks--and these not all through British action. Some were being prematurely or unnecessarily destroyed by their crews. In an effort to stop this he issued the following order:

"Tanks may be blown up only in the following circumstances: (a) the tank cannot be moved, and (b) the enemy is attacking, and (c) the tank has defended itself to the last round.

"The person responsible for giving the order to blow up the tank must send in a report to regimental headquarters, giving the circumstances."

9. FIRE FROM GERMAN TANKS IN A NIGHT ATTACK

A U.S. Army observer in Tunisia reports that in a German night tank attack against one of our tank destroyer units, the German tanks would fire their coaxially mounted machine guns at every object that had the slightest resemblance to a tank or armored vehicle. If the tracer ricocheted (indicating that it had struck a hard surface), it would be followed immediately by a round from the tank gun. Apparently the Germans did not mind wasting ammunition on rock piles, bushes,

haystacks, etc., on the chance of perhaps getting a destroyer.

Comment: German tanks often fire on suspected antitank gun positions. In Tunisia the "rock piles, bushes, haystacks, etc." were, of course, often used for camouflage.

CHEMICAL WARFARE

10. JAPANESE SMOKE WARFARE*

a. Organization of Smoke Troops

For some years past the Japanese have been engaged in developing the means of employing chemical warfare in their Army and Air Force. They are known to have organized a Chemical Warfare Department with a technical research branch and to have established units of Chemical Warfare troops. However, Chemical Warfare activities in the Japanese Army have been more or less decentralized. It is not known definitely whether there is a separate Chemical Warfare branch of the service similar to that in our Army. A recent report states that there has been created in the Japanese Army a new Chemical Warfare Inspectorate headed by Lt. General Kazumoto Machijiri. A Chemical Warfare school is located at Narashino.

A foreign report, admittedly not verified, states that the Japanese have chemical troops organized into sections, platoons, companies, battalions, and regiments - the latter units consisting of approximately 1,500 men each. This report (January 1941) refers to the 5th and 6th Chemical Warfare Regiments as being the only Chemical Warfare units in China. It is pointed out that from this information one might presume the existence of the 1st to 4th Chemical Warfare Regiments. According to this same report, one of the two chemical regiments in China was at that time reported to be preparing to leave for French Indo-China.

According to a document which appears to be an annex to an operations order, and which the Chinese claim to have captured from the Japanese during combat operations in the vicinity of Anking in June 1938, the Japanese employed chemical units on each flank of their forces. These units were provided with chemical projectors and comprised one company on one flank and one squad on the other flank.

According to a recent report from Chungking, China, the Japanese Army has a Chief of Chemical Warfare and a Chemical Warfare Branch. The tactical unit of the Chemical Warfare Branch is the battalion. To allay suspicion, all chemical units are referred to as "smoke" units. The smoke battalion is a flexible organization with any number of smoke companies above two. Each combat regiment gives special training in gas warfare to selected men. Each regiment is able to form one smoke company of such men. However, the smoke company is not listed as a tactical organization of the regiment. Each regiment has a gas officer.

*Reprinted from a recent Chemical Warfare Bulletin.

b. Japanese Smoke Tactics

A translation of a Japanese military training pamphlet on the "Use of Special Smoke" indicates that the Japanese are familiar with the tactical employment of smoke. The translation of this Japanese document states that "It is a short cut to victory to launch vigorous and dashing assaults under the barrage of special smoke, taking good advantage of its effects," and further states that "ordinary smoke may be used to enhance the screening effect of the special smoke." It is pointed out that gas masks should be worn in such cases, and not removed until ordered. The obvious conclusion is that the "special smoke" is toxic.

The principal Japanese weapon for the employment of chemical munitions, according to a reliable foreign report, is the 90-mm mortar type "94" for which a maximum range of 4,155 yards is claimed. It fires a projectile weighing from 11 to 57 pounds. The total weight of this trench mortar is approximately 350 pounds.

Both non-toxic and toxic candles have been used by the Japanese. Non-toxic types include smoke candles and lacrimatory gas candles. (See Tactical and Technical Trends Nos. 7, p. 10 and 21, p. 11.) The former is reported to be filled with a Berger-type mixture of zinc, zinc oxide, and clay-like material, the latter filled with tear gas.

A Japanese handbook on the use of toxic smoke generators enumerates the following points:

(1) Various alternatives are given as to density, and it is stated that generators put down 1 meter apart may affect an area 1,500 meters (1,640 yards) deep. The normal density, however, is given as 2 or 3 rows of generators not less than 20 cm (7 to 8 inches) apart.

(2) The ideal distance of the release line from the enemy is given as 300 meters (328 yards) and the maximum as 500 meters (547 yards).

(3) Generators are not to be employed in daytime unless the weather is dull and the speed of the wind does not exceed 6 to 10 mph. Under such daytime conditions, they may be employed "at short distances."

(4) The value of combining ordinary smoke with toxic smoke is stressed. The advantages claimed are that ordinary smoke will show the direction of the wind before the toxic generators are ignited. This will give the infantry additional cover during their advance.

The same handbook states that the commander of the smoke unit must cooperate with the commander of the unit with whom generators are to be used, and he must reconnoiter. Planning his smoke screen according to the general plan of attack, he must issue orders covering the following points:

(a) Information regarding enemy and friendly troops
(b) Location of objective and results desired
(c) Position of smoke line
(d) Orders covering meteorological information
(e) Probable zero hour for ignition
(f) Disposition to be taken up after ignition
(g) Pursuit and attack plans
(h) Transportation orders
(i) Signal plans for the ignition order.

c. Actual Use of Smoke by the Japanese

In the first battle of Changsha, China, during October and November 1939, the Japanese made very extensive use of smoke screens. They are also reported to have used smoke extensively in operations of all kinds in the attacks in Malaya, but only to a limited extent in the Burma campaign.

Some 200 smoke floats, weighing 22 pounds each and with an emission time of 8 minutes, were reported used in the Japanese landing operations at Anking, in June 1938.

Japanese orders, captured by the Chinese, indicate that 1,300 small generators were to have been used by the infantry together with toxic generators in different sectors, in the ratio of between 1 : 10 and 4 : 10, respectively.

The Japanese used steel, floating smoke pots, with a chlorsulfonic acid filling, during the landing operations at Milne Bay in New Guinea.

In August 1936, a Japanese newspaper referred to the development of smoke-forming mixtures capable of functioning in extreme cold (-60 degrees F). The mixture was composed of stannic chloride or antimony pentachloride and titanium tetrachloride.

Japanese plans for the use of smoke to screen the unloading of troops and supplies at and near Lae, New Guinea, are revealed in an enemy document, which is paraphrased below:

Three hans (at normal strength they are roughly equivalent to our squads) were selected for the operations, under the direction of a first lieutenant. Each han was given the responsibility for screening a separate area.

No. 1 han was composed of a sergeant major, another non-commissioned officer, and 20 privates. It was allotted 6 collapsible boats, and if needed, an armored high-speed boat. This han was to use 200 smoke candles of the floating type, 10 of the large "94" type, and 160 of the small "94" type.

Nos. 2 and 3 hans were allotted a non-commissioned officer as leader and 15 privates. They were each equipped with 100 floating candles, 7 of the large "94"-type generators, 120 of the small "94"-type generators, and 3 collapsible

boats. In addition to the above equipment allotted to the three hans, 400 floating-type candles were to be kept in readiness.

Regulations for the formation of smoke screens are to be based on orders from Debarkation Unit Headquarters.

When operations begin, all smoke candles are to be lighted at the same time, when the signal shots (red dragon) are fired. The main smoke operations are to be carried out by boats over the designated water area. Smoke operations will also be conducted over land, according to circumstances.

A study of the Japanese diagram shows that in this operation, the enemy planned to lay smoke screens by placing candles on the rear part of boats, and also by placing the floating-type candles at certain designated intervals in the water.

Smoke signaling may be done with the 50-mm mortar, with a vertical range of 100 yards. The following flares have been noted, but their meaning has not been made clear:

Green hanging star (with parachute)
Yellow dragon (with parachute)
Two red stars

ENGINEERS

11. 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.

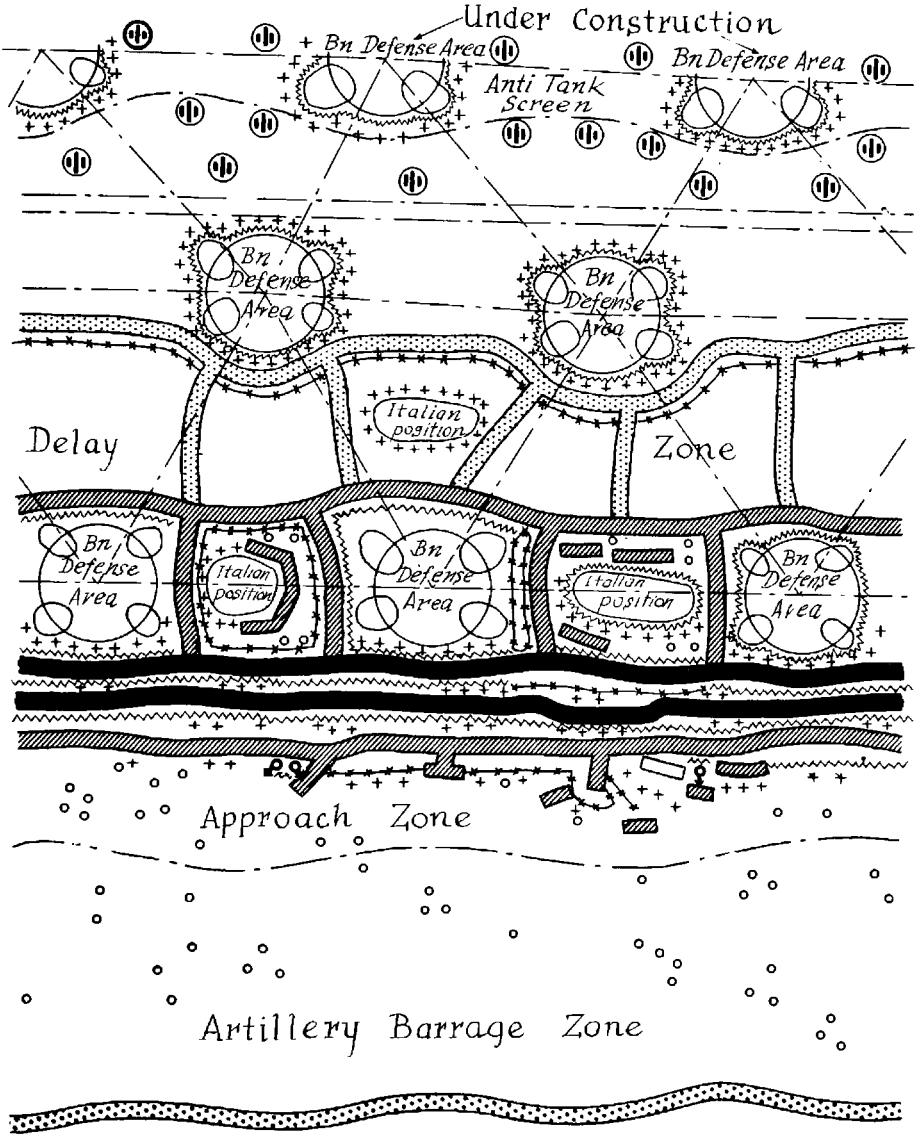
A second step is to lay a belt of mines to afford protection to the second line of defense areas, which is being constructed during this phase. The minefields are from 100 to 200 yards deep and are sometimes not as clearly marked as the front fields. The defense areas are echeloned back from the original 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 front line 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.

LARGE PROTECTIVE MINEFIELD



LEGEND

- Phase 1
- Phase 2
- Phase 3
- Artillery
- British forward minefield
- Antipersonnel mines B4
- Lateral communications
- Barbed wire
- Machine gun
- Concertina wire
- Antitank mines

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.

12. GERMAN BLAST DRIVE ROD, D.K.

A German blast drive rod has been designed for the rapid production of small-diameter, vertical holes in the ground. The letters D.K. are an abbreviation for Donnerkeil or "thunder wedge." The equipment consists of a drive rod, two tubular hand levers, a long thin steel rod, a propellant charge with safety fuze and igniter, and a detonating fuze with prepared igniter. It is used for the erection of telegraph poles and similar supports.

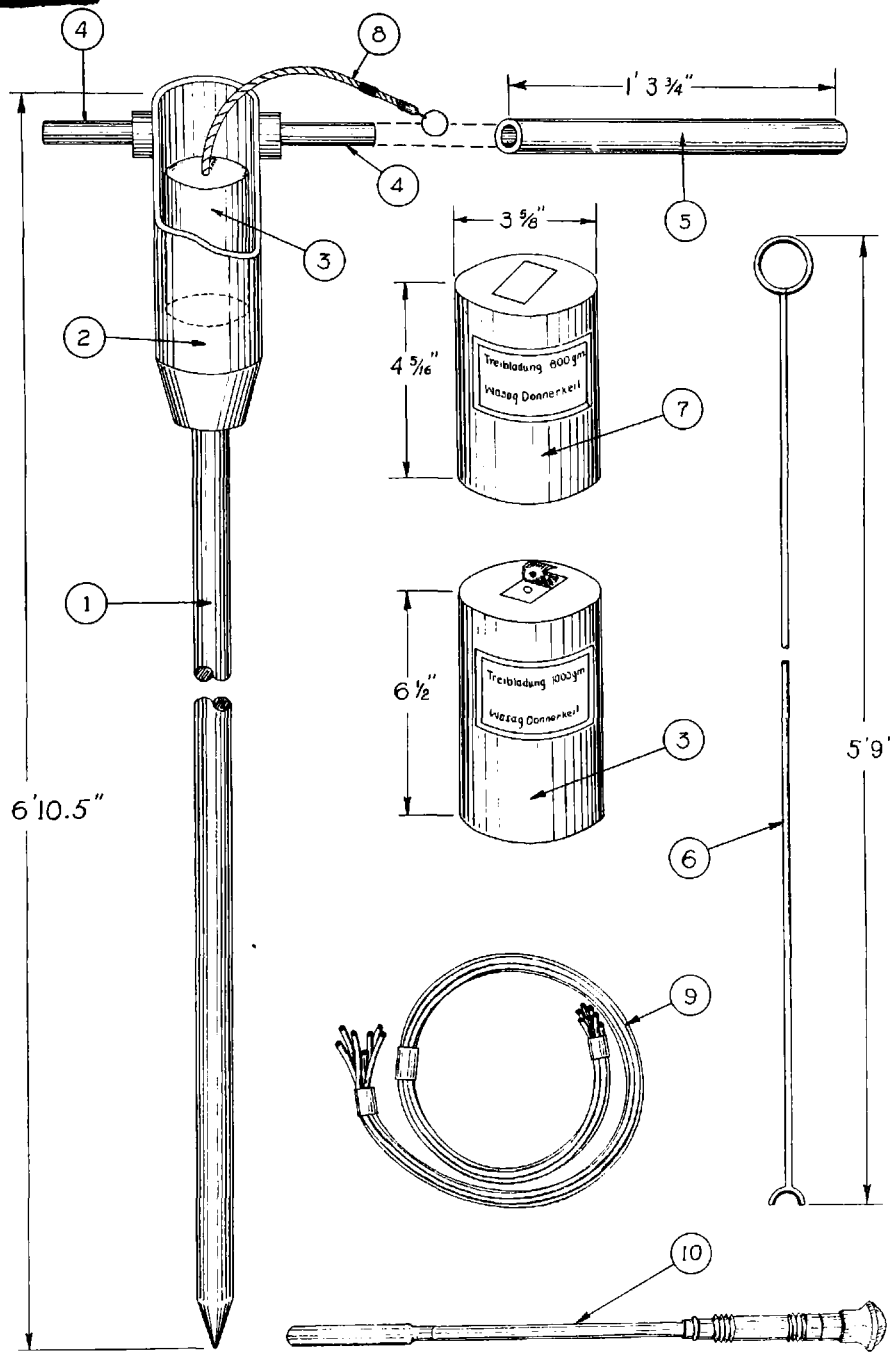
a. Description

The drive rod (1-see sketch) is of steel, 5 ft. 9 in. long and with a diameter of 1.5 in. At its upper end is attached the pot or firing chamber (2), which is cylindrical in shape, 1 ft. long and with an external diameter of 4 3/4 in. The over-all length of drive rod and pot is 6 ft. 10 1/2 in., and the weight 70 lbs. The pot houses the propellant charge (3). Two projections (4) near the top of the pot receive the two hand levers (5), which are of tubular steel, 1 ft. 3 3/4 in. long and a diameter of 1 3/8 in., each lever weighing approximately 2.2 lbs. The thin steel rod (6) is 5 ft. 9 in. long and has a diameter of 1/4 in., with one end forked and the other provided with a loop. The propellant charge (3) is cylindrical, 6 1/2 in. long and with a diameter of 3 5/8 in., and contains 2 lbs. 7 oz. of black powder. A small charge (7) is also included; this has the same diameter as the propellant charge (3) but is only 4 3/8 in. long and weighs 1 lb. 7 oz. The propelling charge is initiated by 1 ft. of safety fuze (8) giving a delay of about 30 seconds, and fired by a Zdschn. Anz.* 29 or Zdschn Anz.* 39 friction igniter (see Tactical and Technical Trends No. 26, p. 21.) The explosive charge consists of seven 5-foot lengths of instantaneous fuze (9), with a total weight of 11 ounces, tied together in three places; this charge is fired by a "demolition set" (10) consisting of a detonator, 6 inches of safety fuze, an adaptor, and a Zdschn. Anz. 39 igniter, and giving a delay of 15 seconds.

b. Method of Use

The drive rod (1) is set vertically over the spot where the hole is to be drilled, and is pushed in by hand until securely held. The propellant charge is

*Abbreviation for safety-fuze igniter.



GERMAN BLAST DRIVE ROD, D.K.

then inserted in the pot (2) (the large charge (3) being used for hard and the small (7) for soft ground) and fired, driving the drive rod into the ground. The lever rods (5) are placed over the projections (4) and worked until the drive rod (1) is free and can be withdrawn. The bundle of instantaneous fuze (9) is then placed in the hole by means of the rod (6), sufficient fuze being left above ground for attachment of the demolition set. Firing of the instantaneous fuze enlarges the hole to a diameter sufficient to take a telegraph pole.

INFANTRY

13. GERMAN HABITS IN DEFENSE AND ATTACK

General

Obviously drawn from battle experience, a set of rough lecture notes entitled "The German Army and You," received from the British School of Infantry, has provided the source material for this article. It is stated in the introduction that enemy methods lack originality and, because of the tendency to repeat the same methods, repay study.

Part I - German Habits in Defense

a. Location of Positions

(1) Advanced positions

Advanced positions (Vorgeschobene Stellungen) are apt to be from 6,000 to 8,000 yards ahead of the main line of resistance. Always covered by German artillery fire, they are usually held by reconnaissance units, frequently motorized, including motorized machine-gun battalions, vehicles of which it is important to recognize. With antitank guns and fire power, units occupying these positions hold key points (railways, crossroads, and river crossings) and engage in demolition and patrolling operations. Their mission is to get early information as to the point to be attacked, and promptly pass it back. When attacked, they withdraw under the protection of their own artillery.

(2) Outposts

The outposts (Vorposten), in strength at least platoon groups, and perhaps companies, are pushed 3,000 to 4,000 yards in front of the main line of resistance. Outposts are well covered by artillery and are supplied with antitank guns. Liberal use is made of dummies. The outpost mission is to defend the forward observation posts and to deceive the enemy into making a large-scale attack. Such value is placed on forward observation posts that outposts, although they may withdraw under cover of artillery, put up a stubborn resistance.

(3) Main Battle Positions

Main battle positions (Hauptkampffeld Stutzpunkt) tend to be a line of hedgehogs (Igeln), which provide all-around resistance or support points composed of all arms. Sited on high ground for observation, they are likely to be found in triangular groups, two astride and one behind a vital point. Single companies usually occupy an area about 400 yards square. With highly developed arrangements for supply by air, such support points are often isolated, particularly in the case of defended villages. The nature of the ground and the width of the front held, naturally, are the determining factors.

(4) Doctrine of "Schwerpunkt" (Center of Gravity) in Defense

As in offense, where the utmost concentration of effort is applied to a narrow front to crash through all opposition, so in defense, the heaviest concentration of fire and other defensive measures is prepared in order to hold vital points at any cost--at the sacrifice, if necessary, of secondary positions. In country unsuited to tanks, the guiding principle of defense is the maximum use of terrain and mines, with a minimum use of antitank guns. Of course, the main antitank-gun defense is concentrated on terrain suitable to tank attack.

(5) The Doctrine of Mobility in Defense

The Germans base their defensive tactics on the accepted principle that provision should be made for a heavy mobile reserve which will counterattack with the utmost available power as soon as the attack is seen to be thoroughly committed to its plan of operation. This is the Schwerpunkt principle in reverse.

(6) Details of Defense

(a) General

Three antitank guns will probably be assigned to each company position, with three kept in mobile reserve with the battalion mobile guns. Particularly during the construction phase of the defense, camouflage is very thorough. Slit trenches are preferred to the more elaborate types. To dissipate the enemy's fire, considerable use is made of dummy and alternate positions. There are seldom many bursts of fire from the same position. Rather, the defenders move out of the alternate or dummy positions into the real positions.

(b) Heavy Machine Guns and Mortars

The locations of heavy machine guns and 3-inch mortars are not determined solely by range but rather by such considerations as:

i. Site of the observation point.

ii. Method of control. (There is little signal equipment in use; communication by wire is very limited, and there is no radio. Only 8 miles of cable are

provided for both the battalion heavy weapons company and the infantry howitzer company.)

iii. Mortars are usually sited in pairs, from 30 to 50 yards apart.

(c) Siting of Heavy Infantry Howitzers

In the use of heavy infantry howitzers, it must always be borne in mind that the ammunition available to them is apt to be more limited than is the supply for field artillery batteries. Its expenditure must be economical, and the Germans place these weapons where the maximum use can be made of the available ammunition.

(d) Principles of Antitank Defense

i. Even at the risk of firing into supporting troops, the primary duty of all weapons is antitank fire.

ii Extensive use of minefields--as many as 11,000 mines to a division front--is common German practice. Weight for weight, mines are preferred to artillery. Dummy minefields are a favorite device. [Other sources report that there are enough live mines in such fields to make them real obstacles.]

iii. Almost never are antitank guns placed singly, but rather, to prevent flanking, in pairs back to back. In order to impede armored reconnaissance, they may be expected in outpost positions.

iv. Never to fall back before a tank attack is a rule hammered into all German infantrymen. Instead, they are trained to stand fast, and to save their ammunition for use against the foot troops following in rear of the tanks.

(7) Features of Rommel's Retreat Orders

One of General Rommel's directives, which fell into British hands, featured the following principles:

i. Schwerpunkt (center of gravity doctrine, previously explained, which applies to all units regardless of size).

ii. A "main effort" was to be executed by not less than a complete company, heavily reinforced by supporting arms and directed at a point along the main axis of the German withdrawal. [The Schwerpunkt principle emphasizes concentration of force and discourages dispersion.]

iii. Careful flank protection; platoons designated for such missions were reinforced with supporting arms.

iv. Use of tanks, engineers, and scattered minefields.

Part II German Habits in Attack

a. General

The German attack is likely to be stereotyped and fashioned after their instruction training combat exercises. This generalization applies from the highest to the lowest units. One document that came to British hands featured a "Battle Drill," and there are "drills" for assault troops. They emphasize organization and detailed execution. Surprise is sometimes achieved as a result of thoroughness in reconnaissance and the weight of the stunning blow. [Note: Frequent variations in methods are to be expected. The Germans simply emphasize teamwork - not individual grandstand plays. This, the author has apparently mistaken for lack of brilliance in plan and originality.]

b. Thorough Reconnaissance

Special reconnaissance units cover relatively wide areas: in desert warfare and open terrain 12 x 12 miles for infantry, 60 x 60 for armored. Determined to get information at all costs, the German does not hesitate to employ on these missions tanks and antitank guns. German reconnaissance officers accept great personal risk, and the units themselves purposely offer tempting targets in order to uncover enemy gun positions. Patrols are equipped with special night-glasses and wire cutters. Except perhaps in pursuit, the attack is not launched until reconnaissance is complete, with both enemy flanks plotted and, if possible, the enemy rear as well.

c. Outflank, Encircle, Destroy

Capture of ground is not the object of German attack, but rather the total destruction of the enemy. Following upon a search for a point of penetration, the ultimate assault, even if by a company only, must be "frontal," but flanking operations, kept out of the line of the fire support, ensure the enemy's destruction.

d. The Application of "Schwerpunkt" Doctrine

First, a thorough reconnaissance is made of the selected point of attack. This point must be on a good route for the projected advance. A frontage of 400 to 600 yards is sufficient. At the expense of other sectors, an overwhelming force of all arms is assembled before such a thrust-point.

e. The Attack

As soon as sufficient information is at hand, and while reconnaissance is being continuously pushed, deployment and preparation for the attack are made.

(1) The "Break-In" (Einbruch)

(a) Methods

Five different methods of attack are prepared for by drill and exercises, depending on the nature and strength of the opposition as it is discovered. These

are:

Opposition--strongly fortified. In the lead are special assault-troops (Stosstruppen) consisting of combat teams of infantry and engineers. They are followed by tanks and infantry on a very narrow front.

Opposition--well-prepared but not strongly fortified. Normal armored divisions attack with tanks massed in depth, followed by motorized infantry on a very narrow front.

Opposition--strongly-held river line (such as the Meuse, Marne, Rhine, Albert Canal). The infantry divisions, with engineer reinforcements, attack at different points to establish bridgeheads. Then follow the armored units and motorized infantry.

Opposition--lightly held river line. The mechanized reconnaissance units carrying bridging equipment boldly cross and establish bridgeheads. Armored divisions follow.

Opposition--enemy defenses incomplete. Armored divisions attack followed by motorized infantry.

(b) The Fire Fight

Against the selected thrust-point a violent fire is opened. On a battalion front of 600 yards, during a field exercise, were concentrated (as called for by smoke signal)--

6 heavy mortars from the battalion heavy weapons company;
12 machine guns, from the same;
4 light infantry howitzers (75-mm) of the regimental infantry gun company;
2 heavy infantry howitzers (150-mm).

All this, called the "concert," was exclusive of the light machine guns, submachine guns and the allotment of divisional artillery. A similar procedure was followed by the artillery. The slogan is: "Niederkampfen, niederhalten, und blinden"--beat down, hold down, and blind. Great stress is laid on sudden, intense concentrations of fire--not formal barrages--to stupefy the defense, and on the use of smoke. The use of smoke is highly developed.

Hard study has been devoted to the last hundred yards of the assault--books have been written about it-- and the understanding of its significance was thoroughly indoctrinated into the German army by 1938. At very short range, close support is given by 50-mm mortars and smoke grenades, as well as by light machine guns firing long bursts. Factors of noise, shock, fear, and ferocity are all exploited; dive-bombers and screaming bombs (what the Russians call "circus tactics") are piled on, if for no other purpose than to make the enemy fire inaccurate.

(2) The Breakthrough (Durchbruch)

Once the "break-in" has been accomplished, the time-table program of the assault is over. Now the initiative is handed over to the subordinate commanders. Their duty is to "tear the guts" out of the defense. For this purpose, close-support weapons are allotted to the subordinate commanders and their combat teams. As flanks of the attackers become exposed, the attack is not diverted, but the exposed flanks are covered with antitank guns and, if necessary, artillery. Tough localities, such as defended villages, are bypassed, and taken care of by the reserve. Where possible, the gap is smashed open to a width of about 6 miles to permit the passage of pursuit troops without loss from rifle and machine-gun fire.

(3) The Pursuit (Aufrollen)

The object of the breakthrough is deep and rapid penetration. Combat teams relentlessly pursue and never lose contact. As a rule, the smallest pursuing unit is a company with supporting weapons. As in the breakthrough, centers of resistance are bypassed to carry on the pursuit, and flanks are protected by "fanning out" and by the use of defensive positions organized for both all-around and antitank defense.

Part III - Points to be Remembered When Germans Attack

a. Reconnaissance Practice

Signs of "a Schwerpunkt coming here" are: a thorough local air reconnaissance; deep patrolling or raids; and deployment of close-support weapons. Watch closely for--

(1) Mounted or horse-drawn troops: they are almost certain evidence of an infantry division.

(2) A mounted party of more than 32 indicates infantry regimental reconnaissance unit.

(3) Bicycle troops in large numbers indicate an infantry division reconnaissance unit. Motorcyclists alone, not accompanied by side-cars, are probably only dispatch riders, but side-cars suggest armored divisions or motorized infantry.

(4) Armored cars, of the lighter type, may be from an infantry division, which has three in the divisional reconnaissance unit, or they may equally well be from armored or motorized divisions. These latter divisions have mixed reconnaissance units of five light and some heavy cars, and a group of nine light armored cars.

(5) Horse-drawn artillery indicates an infantry division.

(6) Tanks. Armored divisions usually operate reconnaissance platoons of five tanks, moving fast and giving mutual support.

(7) Mine-lifting activity is apt to precede the approach of a Schwerpunkt attack, as are engineers in tanks, the operations of night patrols, and the presence of dive-bombers.

b. German Methods of Attack

(1) Opening Assault

Expect a combination of mass, speed, and momentum, concentrated on a narrow front. If held up, dive-bombers, machine guns, and other close-support weapons will be massed to form a "fire front." The Germans will then try to turn your flanks. NOW IS THE TIME TO LOOK OUT!

(2) Counterattack

Go for the light machine guns and light mortars. Three men lying close together means a light machine gun or mortar, and the mortar gives off a puff of pinkish smoke. To attack them successfully calls for two men working together, one covering the advance of the other until one is in position to use rifle or grenade. Go for the infantry guns, which can be identified by a loud report and a big flash. They are often pushed well forward.

(a) Watch for smoke signals. White smoke means probably "We are here"; colored lights or smoke call for fire support. Turn the information to your own advantage.

(b) Mortars usually fire three ranging rounds, followed by groups of 10 bombs. Don't wait for the group. If you are in the middle of the bracket, MOVE. The 81-mm mortars are usually located in pairs, the 50-mm in threes.

(c) Antitank rifles are usually placed together in groups of three; antitank guns in pairs, or threes, sited back to back.

14. GERMAN TACTICS ON THE MARETH LINE

The following are some brief British notes on the tactics employed by the Germans in counterattacking on the Mareth Front, March 21 to 23, 1943.

* * *

In the attack by the enemy on several of our positions, tanks were not used in direct cooperation with the infantry. A maximum of 20 tanks was seen at one

time, and after proceeding for a short distance they split into groups of 3 tanks each. They were always attempting to get to our flank. The tanks operated in bounds, working from one hull-down position to the next, and stopping at each to shell and machine-gun our positions.

After detrucking under cover of palm trees, the infantry stealthily worked its way forward by making clever use of the ground. Snipers were very active, and covered the advance of the infantry very efficiently. The infantry objective at all times appeared to be to gain possession of commanding ground from which our positions could be overlooked and made untenable.

The enemy made great use of mortars as a preparation for his attack. His fire was extremely accurate and intense and his OP work seemed to be excellent. The Germans made frequent use of tracer bullets to indicate targets for their heavier guns farther back.

On one occasion after the capture of an enemy position by our troops, a success signal (British) was given. The enemy was observed to immediately send up a white Very light and his artillery opened on the newly captured position.

Reports indicate that the enemy did not use the former French pillbox defenses except when driven out of open positions. However, there are some indications that the pillboxes were used for infantry weapons. In the concrete, unroofed emplacements 20-mm, 25-mm, and 47-mm guns were used.

In a company defense area, each platoon had either a 20-mm or 47-mm antitank gun and several machine guns. The enemy made full use of the old communication trenches.

15. BRITISH OBSERVATIONS ON FIGHTING IN BURMA

In response to questions submitted by Headquarters, U.S. Army Ground Forces, the British recently sent in, with other information, the following notes on Japanese battle tactics.

* * *

a. General

The Jap seldom exposes himself to any fire. His trenches are narrow and irregular. He will not be shot out by artillery, bombed out by air bombing or killed by machine-gun fire. He is only to be killed by direct hits with mortar or with grenades. You can surround him but you will have to starve him out or kill him. He will throw grenades until his last breath; many dead Japs have been seen with grenades in their hands.

Jap weapons are copies of modern ones, but are not as good as those of the Allied Nations. Troops should know that our arms are better, and that they can use them better, but that they must see the Jap, hunt him out, and kill him. If you can get the Jap out of his hole, you can see that the smelly rat is no superman, but a small, dirty skunk, who will fight. The whole difficulty lies in hunting him out.

b. Patrols

(1) Our Own

Soldiers should know Japanese methods when undergoing training. They must be taught to slowly and noiselessly approach an area known to be occupied by the enemy. They must lie out in no man's land 1 or 2 days, and listen and look in order to spot enemy positions. The Japs are very patient at this, and so we must be, for we must out-smart and out-fight them.

(2) Japanese

The Jap is known to approach noiselessly and stay in close proximity to the British positions during the day and night. He may be away from his unit a day or two, but when he gets back, he has information.

Jap reconnaissance patrols often consist of only one or two men. They approach close and then listen. They overhear men talking in their trenches and personnel using the telephone. When the information desired has been obtained, they slip back to their own lines and then shoot up British positions. Even when they are on the defensive, they are as obstinate and tireless as they were when attacking. Jap troops for some hundreds of yards in rear of their own front lines talk in whispers or not at all. Indian troops jabber all the time, and cough and spit a lot. Those who do this are causing the death of their comrades, for the Jap is always near, looking and listening.

c. Health

Burma is one of the most unhealthful areas in the world. Malaria and cholera are always present. Simple scratches and bruises are easily infected. Super training effort must be made to instruct and enforce personal hygiene, simple first aid, and camp sanitation before, during, and after operations.

d. Terrain

The terrain in Burma is flat in many places, with rice under cultivation. These flat areas are interspersed with low hills and navigable streams. It is on the low hills that there is heavy, thick jungle undergrowth where the Jap builds his defenses. These hills are the eyes of the enemy. He occupies them and covers the open areas with fire.

e. Climate

The climate is warm the year round, although not so hot during the "winter" months. The evenings during the winter are almost cold. During the monsoons, everything is wet all the time. Transportation on the roads is well-nigh impossible, and the only routes available are streams and rivers. Since roads are few and poor, there is a lot of long and hard marching ahead of the troops who are fighting in this area.

f. Operations

Operations will probably consist of attacking villages and attacking low hills heavily protected with tropical undergrowth. Patrol and infiltration tactics will predominate. They must be continuous, and at night the only direction aid will be that of the compass. The Japs fire mortar and artillery as soon as the British open up, and also, to conceal their own locations and intentions, fire again at approximately the time of impact. They use every ruse imaginable to draw automatic and mortar fire in order to locate the positions of weapons. Strict fire discipline must be maintained, or the Japs will soon know your exact location.

16. JAPANESE MORTAR RANGING BY TRACER FIRE

A novel method of adjusting on, or indicating, target to mortars has been reported to be introduced by the Japanese in Burma. Two machine guns are sited on the target and open up with tracer. About 30 seconds later, the first mortar bomb falls, being aimed at the intersection of the two tracer streams.

Although a certain amount of organization and training is necessary for the operation of this system of target indication, it is considered to have the advantage of being able to spot and indicate targets which could not be observed from a fixed observation post.

ORDNANCE

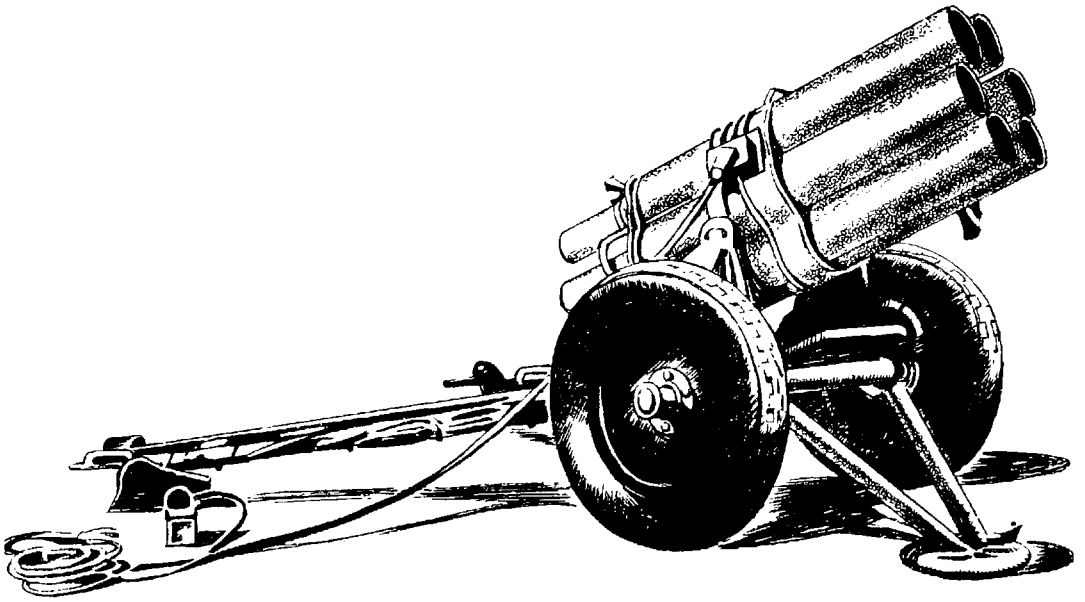
17. GERMAN 150-MM ROCKET CONSIDERED INEFFECTIVE BY BRITISH

From a recent British source comes the following information under the heading "Epitaph to a Secret Weapon."

The British Eighth Army has described the 150-mm smoke mortar (Nebelwerfer 41*), in official reports, as being "in effect noisy but negligible." In recent operations the Eighth Army has encountered HE fire from this weapon and the reporting officers have described it as:

*While referred to by the Germans as a "smoke mortar," this weapon is actually the six-barreled rocket projector--see Tactical and Technical Trends, No. 10, p. 23 and No. 17, p. 39.

(1) Not effective in blast;
(2) Not effective in fragmentation;
(3) Quite effective in noise.



NEBELWERFER 41

One of the reports states that no effect was felt at a distance of 60 yards from the burst. No reports of the ammunition, other than HE, used in this weapon have been received. The Schwere Wurfgerät, having a higher charge/weight ratio, should prove more effective. The latter is a heavy, rocket-bomb thrower (see Tactical and Technical Trends, No. 8, p. 28) projecting a 181-pound HE bomb.

18. SAFETY PRECAUTIONS FOR JAPANESE "91" GRENADE

Tests recently carried out with a number of captured Japanese type-91 hand grenades show that these weapons, so much in favor with the Japanese, might well cause more harm to the thrower, unless properly handled, than to the intended victims.

Although the delay fuze of the grenade is supposed to be 4 to 5 seconds (and is so marked), the delay train has been known to burn in much less time. All our troops, therefore, who capture these grenades and use them, should be informed that they must be thrown immediately after the head of the grenade has

been struck. (This grenade is armed by giving the head a sharp tap.)

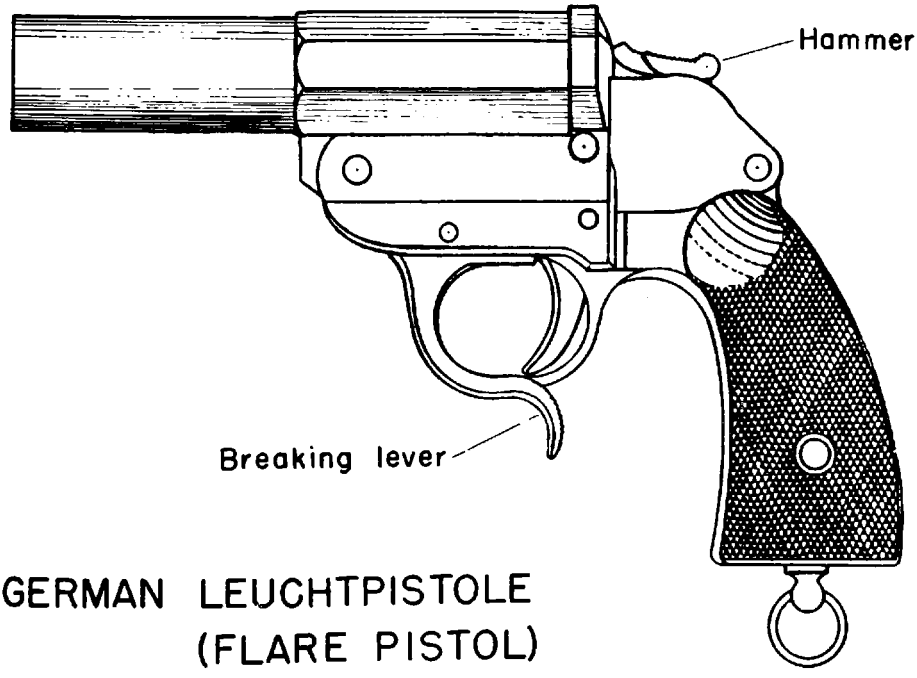
While the delay train is burning, a considerable quantity of black smoke is emitted from the escape hole at the base of the fuze tube. Care should be taken to keep the hand clear of this hole. This smoke emission serves as a feature in recognizing the grenade when in flight.

19. HE GRENADES FOR GERMAN SIGNAL PISTOL

The Germans have developed two HE grenades which can be fired from the signal pistol. The probable existence of these adaptations converts the signal pistol into an offensive weapon, although, to use an old frontier expression, it must "kick about as hard as it shoots." Nevertheless, from the description of the equipment, it would appear to be a compact and most useful auxiliary weapon for close-range fighting.

These grenades have been developed for engaging close targets which cannot be dealt with satisfactorily by infantry weapons or artillery without endangering friendly troops.

They are designed to be fired from the standard German Leuchtpistole



GERMAN LEUCHTPISTOLE
(FLARE PISTOL)

or flare pistol (see Tactical and Technical Trends, No. 23, p. 38.) It appears that the grenades can also be used with the rifled version of the flare pistol. The

latter is known as the Kampfpistole and is fitted with a sight. Both pistols are about 10 inches in length, with a barrel approximately 6 inches long. They are very light, weighing just over 1 1/2 pounds; the caliber is 27 mm. In addition to the two grenades described below, it is reported that the Kampfpistole fires a small nose-fuzed HE grenade, weighing about 5 ounces, with a maximum range of around 100 yards.

a. 2.6-cm Wurfgranate Patrone 326 Leuchtpistole*

The complete round looks like an 8-gauge, conical-ball elephant load in a brass shotgun shell (see figure 1) with the bullet painted yellow. The projectile has the appearance of a miniature mortar shell.

The weight of the complete round is approximately 4.23 ounces, with the projectile weighing about 3.2 ounces. The bursting charge is approximately .25 ounces (108 grains) of TNT; the propelling charge, .105 ounce (26 grains), presumably of rifle powder.

This "mortar shell" has a range of over 300 yards. Since at extreme ranges the dispersion is considerable, it is best not to fire at ranges above 200 to 250 yards. This ammunition can also be used at shorter ranges, such as direct fire on windows and embrasures in street fighting. Similarly, in wooded country it may be used against snipers in trees. Fire at ranges under 50 yards is reported to endanger the firer himself as well as his own troops, because of fragmentation.

As will be seen from the sectional sketch, the internal structure of this bomb is quite unusual, and instead of the firing pin hitting the cap, the cap hits the fixed firing pin in the nose of the bomb. The detonator and bursting charge are enclosed in a case, free to slide forward except for the restraint of the creep-spring, when the safety rod has been removed. The safety rod pushes sideways two metal balls which prevent the bursting charge container and the detonator from moving forward against the fixed firing pin. When fired, the safety rod falls out when the projectile is 10 to 12 yards from the muzzle; the projectile is then armed. On impact, the container drives forward against the fixed pin.

Anyone attempting to use captured equipment should very carefully observe these precautions:

(1) Never fire a cartridge in which the projectile is loose.

(2) Absolutely never extract the projectile from the cartridge case, since this would cause the safety rod to fall out, and this would arm the projectile. A slight jar might cause it to detonate.

(3) After firing, the pistol is broken and the empty cartridge case removed.

(4) If the bomb sticks in the barrel for any cause (this might happen with

*26-mm mortar shell ammunition "326" for flare pistol.

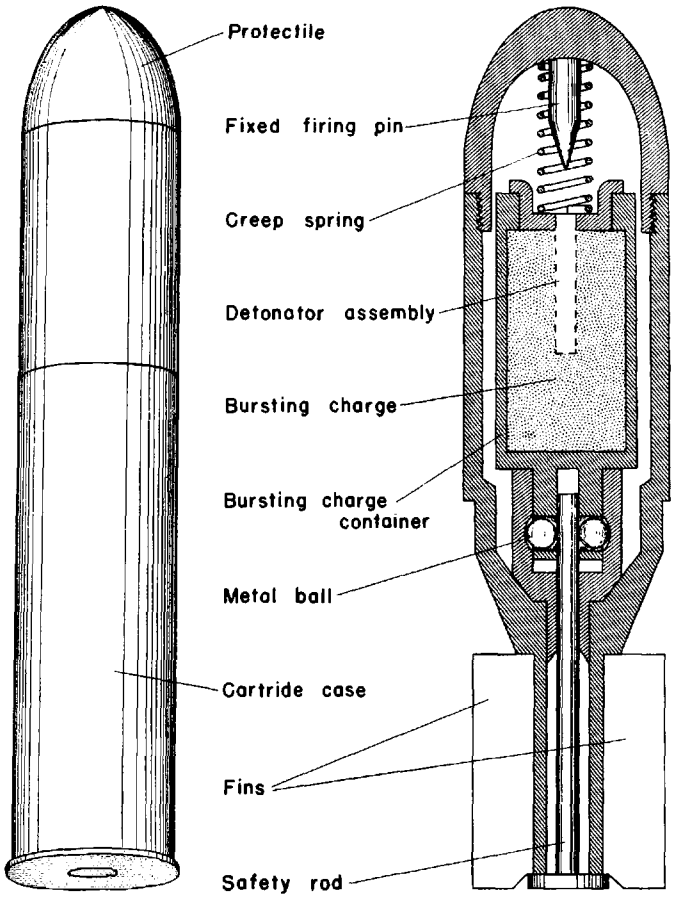

Protectile
Fixed firing pin
Creep spring
Detonator assembly
Bursting charge
Bursting charge container
Metal ball
Cartride case
Fins
Safety rod

FIG. 1

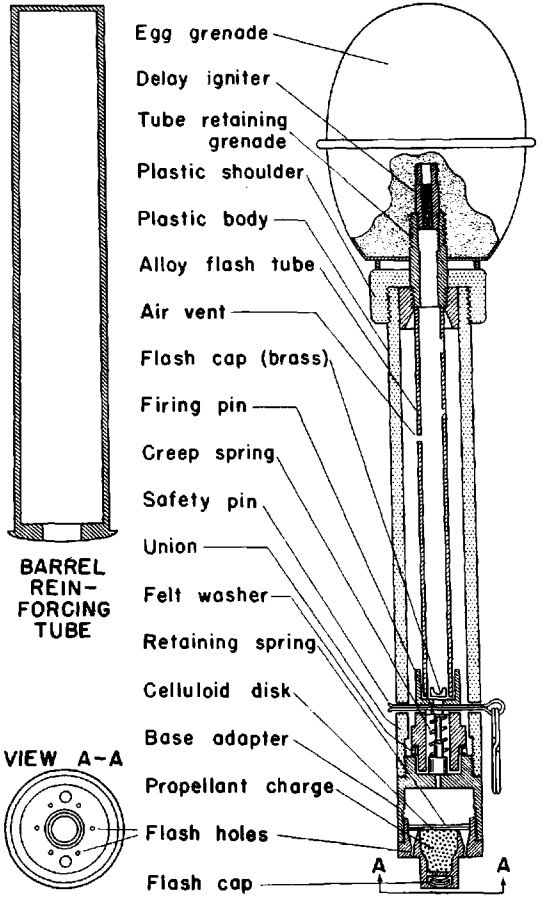

BARREL REIN-FORCING TUBE
VIEW A-A
Egg grenade
Delay igniter
Tube retaining grenade
Plastic shoulder
Plastic body
Alloy flash tube
Air vent
Flash cap (brass)
Firing pin
Creep spring
Safety pin
Union
Felt washer
Retaining spring
Celluloid disk
Base adapter
Propellant charge
Flash holes
Flash cap
A
A

FIG. 2

a foul pistol), never pull the cartridge case out of the breech. By inserting the pistol ejector in the muzzle, carefully press the whole round from the muzzle towards the breech and out from the breech end of the barrel.

b. Wurfkorper 361 Leuchtpistole*

Based on the standard German egg grenade, this ammunition is rather a more powerful weapon than the "mortar-shell" grenade. It has a range of 75 to 85 yards and is particularly suitable for engaging islands of resistance in towns.

The projectile consists of the normal egg hand-grenade with a stem screwed firmly on in place of the combustion fuze 39 for egg hand-grenades (see figure 2). The plastic stem contains a combustion fuze (combustion time is approximately 4 1/2 seconds), on the upper end of which a detonator is fitted. The fuze is inserted into the detonator and the latter into the grenade. In the lower end, the projectile carries the cartridge (propellant charge with percussion cap), which expels the projectile on firing and sets off the combustion fuze. The projectile is secured in the stem by a cotter pin and ring, which must be withdrawn before the projectile is loaded into the signal pistol. The projectile is then "live."

For firing the projectile, a barrel reinforcing-tube or cartridge-adaptor is inserted into the barrel of the pistol. It is pushed in from the rear when the pistol is broken. When the barrel is returned to position, the pistol is ready for loading. The barrel reinforcing-tube should be cleaned about every 100 rounds.

The stem of the projectile is introduced into the tube until appreciable resistance shows that the base of the tube has been reached. The pistol may now be cocked.

c. Instructions for Firing**

During firing, the arm is slightly bent. After continual firing, the arm becomes tired, with consequent decrease in accuracy.

The target can be aimed at only roughly along the barrel. Elevation is given to the barrel according to the range (maximum range with an elevation of 45°.)

The "egg-grenade" ammunition is usually employed for high-trajectory fire, since this is suited to its fuze time.

The "mortar shell" ammunition is used mostly for flat trajectory fire. The point of aim is the center of the target up to about 100 yards, but beyond this, it is necessary to aim higher. The projectile must strike full on its nose to detonate.

*Projectile "361" for flare pistol.
**These have reference to the smooth-bore pistol. Presumably instructions for the rifled pistol are essentially the same, though rifling and the provision of a sight would appear to make for greater accuracy.

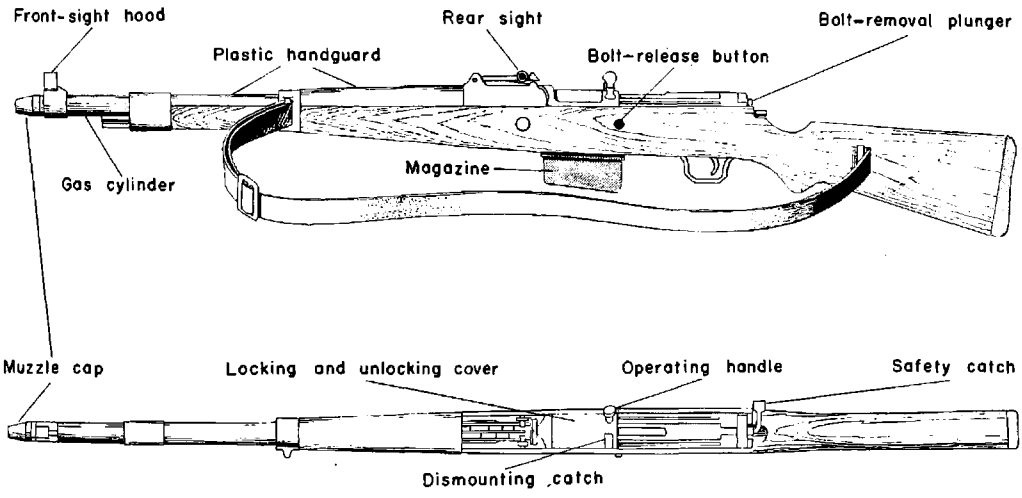
20. NEW GERMAN SEMIAUTOMATIC RIFLE

a. General

Recent shipments of captured enemy ordnance equipment from North Africa included two specimens of the new German 7.92-mm (.312 in.) semi-automatic rifle, the G. 41*. It is a gas-operated, 10-shot, magazine-fed shoulder weapon weighing 10 lbs. 14 oz. The over-all length is 45 inches, the length of the barrel 22 inches.

b. Functioning

It is operated by having the muzzle blast trapped by a cone-shaped muzzle cap and directed against a gas piston in the gas cylinder. The piston is in the form of a collar which fits around the barrel. This piston impinges against a



GERMAN 7.92-MM SEMIAUTOMATIC RIFLE

light piston rod which is located over the barrel under a plastic hand guard. The rear of this piston rod contacts the movable locking and unlocking cover on top of the bolt. This cover is connected to the firing-pin housing which is housed within the bolt assembly. As the cover is driven rearward 9/16 inch by the piston rod, it pulls the firing-pin housing back, causing the two movable locking lugs in the bolt head to be withdrawn from the locking recesses in the receiver by a camming movement. The bolt is then free to move, and residual pressure in the barrel drives the bolt rearward, ejecting the spent round and cocking the mechan-

*Gewehr 41--Rifle 41.

ism. As the bolt moves to the rear it also actuates the hammer, compressing the hammer spring and causing the hammer notch to be engaged by the sear. After the bolt stops its rearward motion, it returns forward under the impetus of the compressed recoil-springs in the bolt body, strips a new round from the magazine, and inserts it into the chamber. As the bolt closes, the two locking lugs are driven sidewards through holes in the bolt-head into the locking recesses in the receiver walls by the camming action of the firing-pin housing. Positive locking at the moment of firing is ensured by cams cut on the firing-pin housing, which make it necessary for the locking lugs to be clear of the firing-pin housing before the firing pin can contact the primer of the round in the chamber.

c. Sights

Sighting equipment consists of the usual German open-V-notch rear sight mounted on a leaf sliding on a ramp for elevation. The rear sight has no adjustment for windage. The front sight is of the normal inverted-V-type and is shaded by a hood, as in lately manufactured German bolt-action rifles.

d. Miscellaneous

Feed is from the top, using two of the ordinary 5-round Mauser clips. The rifle takes a short knife bayonet. It uses the standard 7.92-mm (.312 in.) German rifle ammunition.

There are many stamped parts, making for ease of manufacture, but the receiver and bolt mechanism require rather intricate machining.

GENERAL

21. JAPANESE NATIONAL FESTIVALS

Since 1937 there has been a great increase in the number of Japanese days of commemoration and celebration, but most of them have been made the excuses for special drilling, assemblies, or labor effort, rather than for relaxation.

A distinction should be drawn between (a) national holidays which are officially designated and observed with appropriate flag display throughout the empire, and (b) festivals which are observed by popular custom by some or all of the people but have no official government recognition.

Before the war (1937) there were 12 official national holidays. Since then there has been an increased emphasis upon military celebrations, and all events relating to the Imperial family, such as birthdays, death days, etc.

The following is a list of the more important Japanese national holidays:

January 1, New Year's Day

January 3, Emperor celebrates opening of New Year - the event being called Genshisai

January 8, Beginning of the Army year

February 11, Anniversary of accession of the Emperor Jimmu, and the founding of the Empire (Kigen Setsu) (this date as well as the year to which the founding is assigned--660 B.C.--has, of course, no foundation as an anniversary in fact)

March 6, Birthday of the Empress

March 10, Army Day (anniversary of Battle of Mukden, 1905)

March 20 or 21, Spring Equinox Festival

April 3, Anniversary of the death of Emperor Jimmu

April 29, Emperor's Birthday (this day is always especially associated with the Army; in peacetime it was marked by elaborate military reviews in Tokyo)

April 30, Festival of Yasukuni Shrine

May 27, Navy Day (anniversary of the Battle of Tsushima, 1905)

September 23 or 24, Autumn Equinox Festival

October 17, Kannamesai, or Imperial Thanksgiving of Autumn

November 3, Commemorative festival for the Emperor Meiji

November 23, Niinamesai, or Autumn offering to the Imperial ancestors

December 8, Great East Asia Day

December 25, Anniversary of the death of Emperor Taisho

Since September 1939, the Japanese have been required to observe "Greater Asia Commemoration Day" (Koa Hoko bi--興亜奉公日) on the first day of each month, a day of national self-denial in honor of the men fighting for Greater Asia. On this day there was to be no smoking, drinking, etc. After the attack on Pearl Harbor, the day for commemoration was altered to the 8th day of each month.

The Yasukuni ceremonies have assumed major importance, because on these occasions the soldier dead are enshrined and deified. This is the great reward which makes all the sacrifices seem bearable to the people at large. This is the only occasion throughout the year when the Emperor bows to the tablets and spirits of dead subjects who have become minor gods in the spirit world. The actual ceremonies last 3 days, beginning April 30; the relatives arrive from all parts of Japan throughout the preceding week, during which entertainment is provided for them. The second, less important of the semi-annual Yasukuni Shrine Festivals takes place on October 22 or 23.

It may be worthy of note that the public is never told of the true extent of Japanese losses, but that the announcements of names to be enshrined at Yasukuni are designed to give popular impression of low losses. Furthermore, announcements include the names of soldiers who died in the Meiji and Taisho periods as well (1868-1926), thus making the announcements obscure and uncertain, and impossible to check.

22. NOTES ON JAPANESE FORCES ON ATTU*

The Japanese plan of defense for Attu Island was to defend the high ground to the rear of each bay area. Only limited beach defenses were planned. This high ground ranging from 1,000 to 2,000 feet in height is irregular, rocky, snow-bound at this season (May), and almost continuously shrouded in clouds and fog. Out-numbered, outgunned, and outflanked, the enemy defense became a delaying action with an orderly withdrawal to the Chichagof Peninsula for a last ditch stand.

The original Japanese installations were largely concentrated in the Holtz Bay--Chichagof Harbor areas. Valleys from both sectors lead inland to high passes which in turn lead down to Massacre Bay and Sarana Bay. These passes thus became the keypoints of the Japanese defense against attack from the rear.

*See map on page 40.

The original American landing was at Blind Cove behind the high ground NW of Holtz Bay. The two main American forces landed, however, at the northern end of the beach at the West Arm of Holtz Bay and at Massacre Bay to the south. These landings were unopposed, and our troops and supplies were put ashore without casualties, although intense fog slowed up operations. Naval gunfire was of great assistance in neutralizing enemy positions at the head of Massacre Valley and in keeping the enemy under cover in the Holtz--Chichagof area. Weather curtailed air operations during the initial phase.

Certain general observations on Japanese ground tactics can be made. The Japanese counterattacked in small groups with reckless abandon, even when the odds were very much against them. They attempted infiltration tactics (again favoring small groups) but with less success than in Southwest Pacific jungle fighting. As might be expected, harassing fire by Japanese snipers was encountered in all sectors. Enemy rifle fire was accurate only at extremely short ranges, but excellent camouflage and smokeless, flashless ammunition made snipers hard to locate. (Actually the powder is not "flashless." It is true that the Japanese 38 year (1905) pattern rifle shows no flash when fired at night. However, this is caused not by the flashless properties of the powder but by the long barrel (31.5 in.), which results in the complete combustion of the powder before it reaches the muzzle. The smaller powder charge and lighter bullet combine to give a lower muzzle velocity, which also helps to eliminate flash. Flash is present in Japanese machine guns, carbines, and short rifles because some still-burning powder is blown out of the muzzle of these shorter-barreled weapons, proving their powder is not actually flashless.)

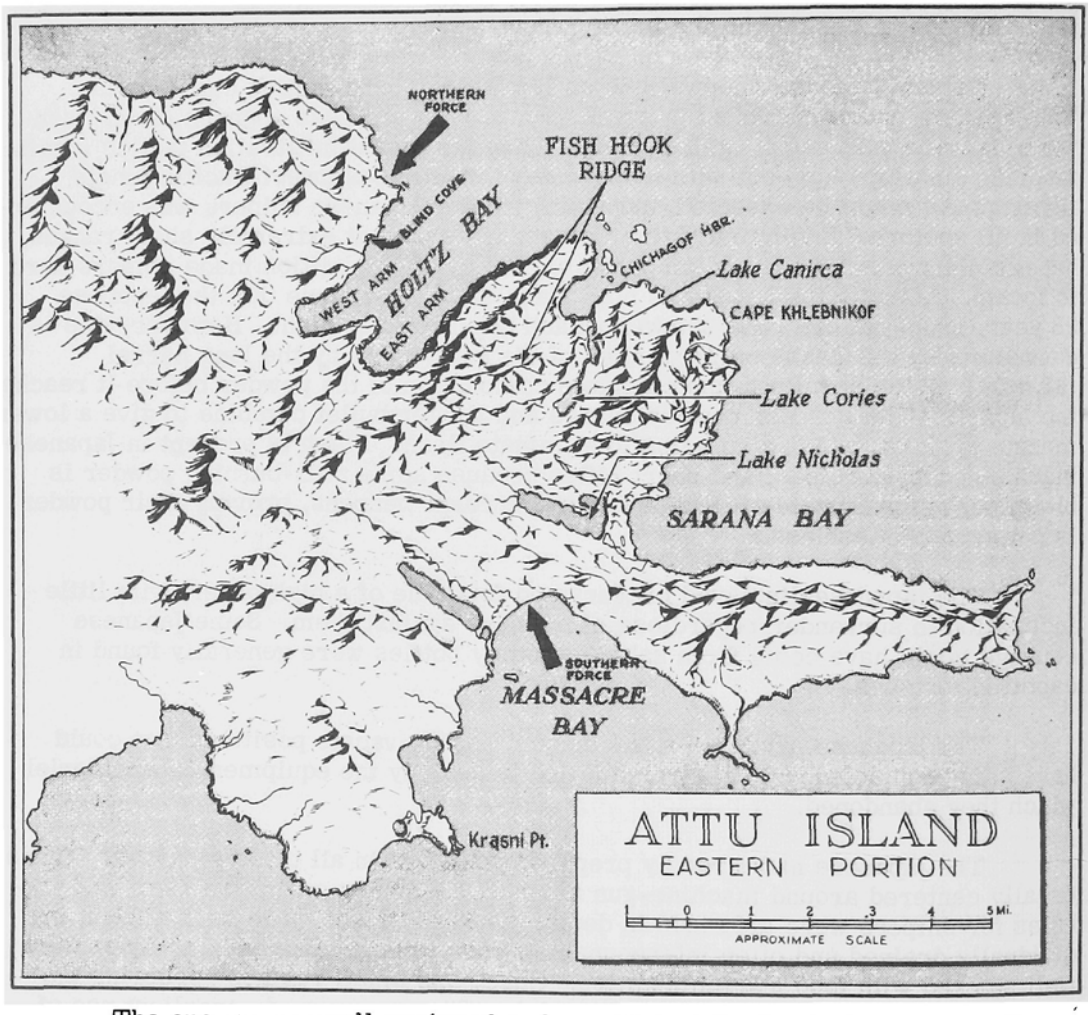
The Japanese displayed bravery and fortitude of a high order, with little inclination to surrender regardless of the odds against them. Some Japanese courage might have come from sake, as empty bottles were generally found in captured foxholes.

The Japanese exhibited a tendency to hastily vacate positions that could have still been defended. They also failed to destroy the equipment and materiel which they abandoned.

The Japanese had strongly prepared positions in all the key passes. These usually centered around machine-gun nests, but mortars were also used, and foxholes for snipers were arranged in depth. These foxholes were well-hidden, individually drained, and often interconnected with underground tunnels. They were well stocked with food and ammunition. Caves and small ravines bordering the passes became effective enemy strongpoints. The enemy made excellent use of the cover of clouds and fog, and the resultant limited visibility. This limited visibility aided enemy camouflage, prevented our estimating Jap strength, and restricted our air support and supply operations. In general the attacking Americans had to flank and overcome each position in hand-to-hand fighting using bayonets, rifle butts, and hand grenades. Most of the fighting in the higher areas was above the snow line, where the enemy made extensive use of short skis. American attacks usually followed considerable night patrol activity intended to locate weak points in the enemy positions. Effective artillery fire sometimes preceded Ameri-

can assaults. One enemy strongpoint was taken after scaling a 60-degree slope.

Japanese positions around the West Arm of Holtz Bay were so well prepared as to indicate an attack in that sector might have been expected. The trenches, dugouts, rifle pits, approaches to gun emplacements, and covered tunnels were effectively camouflaged. On the East Arm the air strip was found nearly completed. Hand labor had generally been employed, but two gas rollers and a Chevrolet-type truck with rear roller wheels were found. Push carts on narrow-gauge rails, and rickshaw-type wheel barrows, were found.



The enemy was well equipped and supplied at the beginning of operations. He is believed to have had around 2,100 troops on Attu. He used standard Japanese uniforms (our aviators reported difficulty in front-line differentiation between American and Japanese troops). The enemy had wool and worsted short coats, kersey-lined trousers, and heavy sheepskin parkas. He had raincoats and rubber boots, and blankets of good grade although they were only 3 by 5 feet in size. Among captured weapons was a 3-inch AA gun, individually sighted and not director controlled. These guns effectively used time shell with a low air burst.

Several were captured and restored by American troops who then used them against the Japs. Also captured were many mortars, "knee" mortars,* and Nambu light machine guns. The enemy is believed to have used 75-mm howitzers and 70-mm guns in defending the Holtz--Massacre pass. The enemy had many light and heavy machine guns and grenade throwers, and also medium artillery pieces. In the Chichagof Harbor area where he had fixed AA guns, he turned them against American ground troops. One captured strongpoint had been occupied by an enemy rifle platoon, machine guns, and a field piece. Enemy AA activity came mainly from the Chichagof area, where he was dug in along the beach, and among the buildings at Attu Village. In the AA machine-gun fire thrown up at our planes, many red tracers were noted. The most effective Japanese weapons were grenade launchers, mortars, and AA guns.

The Japanese on Attu were isolated after the American landing on May 11. The only known supplies that they received were in the form of two packages dropped from one of the Jap planes over Chichagof on May 22.

Enemy buildings were mostly used for storage. Salvage and reclamation tactics of the Japanese were apparently poor, as several slightly damaged barges were captured that they had made no attempt to salvage. The dimensions of the captured barges were: length (ramp up) 48 ft. 4 in.; ramp down 49 ft. 4 in.; beam 11 ft. 3 in.; inside of ramp, 7 ft. 8 in. These barges had a double keel and were extremely sturdy. Japanese tents were 11 feet high and 24 feet in diameter, and housed 30 men. Several damaged planes and 9 airplane engines were found in poor condition at Holtz Bay, where they had been stored on the beach for several months. The Jap ration included dried squid, canned salmon, beans, rice, dried potatoes, canned emergency rations, duck, canned mandarin oranges, fresh fish, and seaweed. Strings of freshly caught cod were found. Very large quantities of fresh vegetables, dried foods, ammunition, blankets, rifles, charcoal, and clothing were captured intact in the Holtz Bay area. In fact so much in the way of supplies was captured that it would be logical to suppose the Kiska had been receiving supplies from Attu.

*Actually this is not a "knee" weapon. It is a 50-mm grenade launcher with a small base plate designed to rest on the ground or any solid object.

SECTION II

THE FORCING OF THE NAREW RIVER CROSSING

THE FORCING OF THE NAREW RIVER CROSSING

The following translation from a German military review gives an account of the German crossing of the Narew River at a point about 100 miles northeast of Warsaw on June 25, 1941. The account illustrates very concretely the German methods employed in a small tactical operation. Of special importance in the success of this action were: The effective combined use of the various arms (particularly supporting artillery); the flexibility of control, which permitted rapid adjustment of tactical plans to meet a changing situation; and, finally, the offensive spirit that characterized the whole operation.

The Vorausabteilung (advanced detachment) is to be distinguished from the Vorhut (advance guard) and operates in front of the latter. It is formed to carry out specific tasks connected, at least partly, with combat reconnaissance. Its size and composition are flexible. In the action described below, the Vorausabteilung is converted into an Angriffsgruppe (attack group), prior to the general attack.

A map will be found at page 48. The translation follows.

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THE GERMAN PLAN OF ATTACK FOR JUNE 25

The 499th Infantry Regiment, reinforced, advancing by forced marches, had supported the advanced detachment (Vorausabteilung) of the division in its defensive engagement with enemy* tanks attacking west of Rajsk. On the evening of June 24, the most advanced elements of the regiment had reached the Orlanka crossing at Chraboly without any important contact with the enemy. Orders were issued for the regiment to advance the next morning on Ryboly, located north of the Narew. It was assumed that the enemy would evacuate the Orlanka sector and withdraw behind the Narew in the direction of Bialystok (about 15 miles north of Ryboly).

An advanced detachment (Vorausabteilung) for the regiment was formed, consisting principally of the 9th Bicycle Company, a platoon of engineers (Pioniere), and an assault gun platoon.** This detachment was to assemble at Banki at 0600, proceed by way of Rajsk and the Orlanka bridge at Chraboly, take possession of the Narew crossing 3 kilometers southwest of Ryboly, and keep this crossing open for the regiment coming up from the rear. The regiment was to follow the advanced detachment in such a way that the advance guard, consisting of the 3d Battalion (less the 9th Bicycle Company), one platoon of light infantry howitzers, one antitank platoon and one cavalry squad,† was to reach the hill 1 kilometer northeast of the Narew bridge as its first objective, while the main body was following at a distance of 2 kilometers.

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*"Enemy" of course from the German viewpoint. Throughout the translation "enemy" has reference to the Russians.

**Probably two 75-mm self-propelled guns.

†The infantry regiment includes a mounted infantry or a cavalry platoon, consisting of a headquarters and 3 squads.

Plans for the support of the advance across the Orlanka River were as follows: strong artillery, emplaced at Rajsk, was to be put into readiness for action; from its bridgehead positions at Chraboly, the 2d Battalion (reinforced) was to cover the crossing of the advanced detachment; a battery of assault guns was to be attached to the advanced detachment to cover the advance beyond the Orlanka.

THE ADVANCED DETACHMENT REACHES THE NAREW

The reinforced 9th Bicycle Company (the advanced detachment) arrived at the Chraboly bridgehead at 0730. Inasmuch as the battery of assault guns which had been ordered to the Chraboly bridge had not yet arrived, the company waited. Not until 0815, upon arrival of the assault-gun battery, did the advance detachment start on its march, assault guns ahead.

The forward reconnaissance elements very soon reported that a weak enemy force with machine guns was holding the southern edge of the woods south of the Narew crossing. At 0830, the assault guns, with the most advanced elements of the 9th Company, reached the enemy-occupied edge of the woods and attacked with the object of throwing the enemy across the Narew and seizing the hill north of the crossing.

Effectively supported by the assault guns and the antitank platoon, the company succeeded in throwing the enemy back; a few isolated individual Russian soldiers continued to fight stubbornly in the woods. The main enemy force withdrew to the east and harassed the 9th Company from that direction by means of rifle and machine-gun fire. The company reached the north edge of the woods and found itself before the bridge and the hill to the north, both occupied by the enemy.

Meantime, the advance guard (reinforced 3d Battalion), having been somewhat delayed by skirmishes with enemy snipers, had been late in arriving at Rajsk. In order that the march of the main body should not be held up because of this delay, the regimental commander ordered the main body to close up on the advance guard without regard to the prescribed distance of 2 kilometers. The regimental commander went to the northern bank of the Orlanka, where the reinforced 2d Battalion was assembling most of its elements, the remainder continuing to cover the Orlanka crossing. There, the message from the 9th Bicycle Company reached him saying that it was attacking weak enemy forces at the edge of the woods south of the Narew bridge and that the Narew bridge was occupied by stronger enemy units.

Thereupon, all available mobile forces, namely, one engineer company and one antitank company, were rushed ahead in order to reinforce the 9th Company, and were placed under command of the advanced detachment commander. By relentless attack, they were to force the crossing of the Narew and hold the hills beyond as a bridgehead until the arrival of the regiment. This movement of these reinforcements proceeded with despatch, and the regimental command post was moved forward to the hill 2.5 kilometers southwest of the Narew bridge.

ESTIMATE OF THE SITUATION (ABOUT 0900)

Here, two reports arrived. First, prisoners stated that the enemy was intending to defend the Narew. Their statements were at first regarded as incorrect, in view of the general estimate of the situation. However, a short time later an air observation report came in that enemy motorized forces were advancing on Zabludow from the northeast; this appeared to confirm the prisoners' statements.

The regimental commander now estimated the situation to be that the enemy was bringing up forces to defend the Narew southwest of Ryboly. He stuck to his plans of seizing the crossing from the enemy by means of a quick grab and decisive attack before the latter could bring up any stronger forces. To effect this plan, the approaching advance guard (3d Battalion) was ordered to attack immediately, from march formation, to the right of the road and to seize the hills beyond the Narew bridge. The 1st Battalion, which was closely following the 3rd, was to move forward rapidly and get into attacking position on the left flank of the 3d Battalion, with the same mission, namely, to seize the hill beyond the river as quickly as possible and hold it.

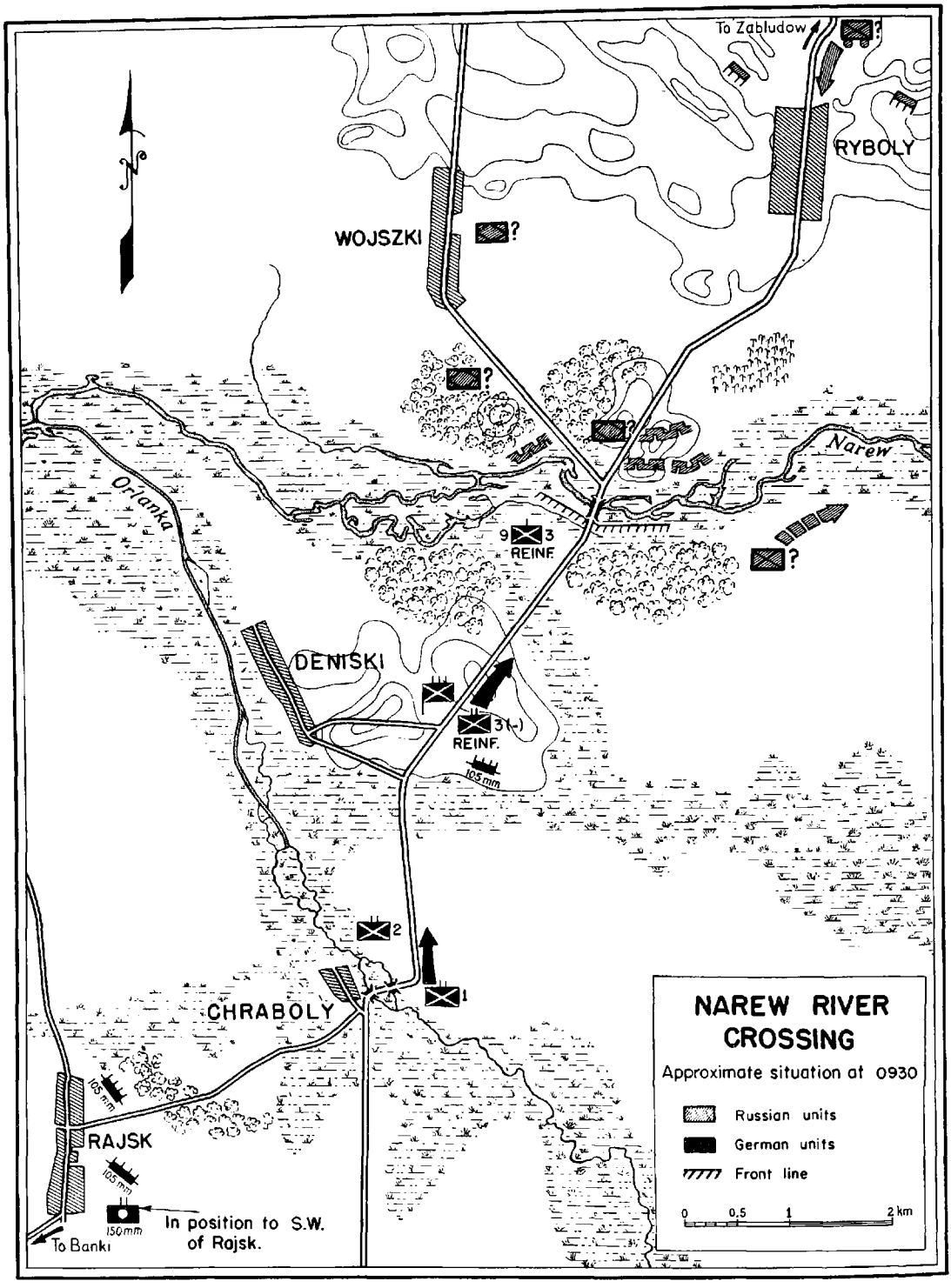
As for the artillery, one battery was moving to a position east of the new regimental command post; two batteries still were concentrated to the east of Rajsk, ready to open fire. They were to hinder the approach of the enemy motorized forces by means of interdiction fire on Ryboly. A battalion of medium artillery, a liaison officer of which reported to the regimental staff, was to fire on the road south of Ryboly so as to block the enemy's path to the Narew bridge.

THE ENEMY RESISTANCE IS STRONG (0930)

At 0930, the 3d Battalion reached the hilltop at the command post. According to messages reaching the regiment at that time, the situation in front was bad: the enemy had heavily occupied the hills beyond the river and was inflicting severe casualties, by means of rifle, machine-gun, mortar, and artillery fire, on the troops of the advanced detachment.

Thereupon, the regimental commander went forward himself and ascertained that enemy artillery, reckoned at one medium battery, was shelling the road south of the bridge as far as the regimental command post; some rounds even fell into the positions at Chraboly. The sound of battle indicated that the enemy was resisting stubbornly.

In order to force the attack forward, the regimental commander ordered one of the assault gun platoons to push at once to the far bank of the Narew and engage the enemy. Since signal flares, indicating enemy tanks, were now going up from the wooded area south of the bridge, this order was supplemented by special directions to destroy enemy tanks on the far river bank. An additional assault gun platoon received the same orders. The 3d and 1st Battalions were impressed, once more, with the urgent need for a quick advance. Meanwhile, enemy tank concentrations had been reported at Woiszki and in the woods to the


To Zabludow
RYBOLY
WOJSZKI
Narew
Orlanka
9 3 REINF.
DENISKI
3(-) REINF.
105 mm
2
1
CHRABOLY
105 mm
RAJSK
105 mm
150mm
In position to S.W. of Rajsk.
To Banki
NAREW RIVER CROSSING
Approximate situation at 0930
Russian units
German units
Front line
0 0,5 1 2 km

south, and were being engaged by the artillery.

At this time, messages were arriving from the advanced detachment saying that fire from enemy artillery, tank guns, heavy mortars, and infantry howitzers, in addition to well-aimed rifle fire, was preventing any forward movement. Some elements had got as far as the river; there, however, they had been stopped by enemy machine-gun fire. Consequently, though the assault guns were on the far bank, no infantry or engineers had reached it as yet. Artillery was therefore ordered to engage the enemy on the north bank.

The enemy artillery fire increased; it was estimated at 4 medium and 4 light pieces. Furthermore, it was reported that the enemy was installed in field fortifications on the far bank of the Narew, and that numerous tanks were engaging the attacking force. No report that the 3d Battalion had succeeded in moving forward was forthcoming. Likewise, the report that the assault guns had got across the river, expended their ammunition, and recrossed with more ammunition, could not change the general picture--that a continuation of the attack did not appear to promise success under the methods employed so far. On the contrary, it seemed possible that casualties would be augmented without the objective being reached.

Moreover, it was ascertained that the 1st Battalion had lost much time in its advance by deploying across open terrain and that it was still lagging behind; early assistance from this battalion was not be be expected. From the commanding hills, the enemy completely enfiladed the river--600 to 1,000 meters wide, level, and devoid of cover. Finally, the avenue of approach (particularly east of the road) was made difficult by extensive pools and stagnant channels, and the attacking force was not familiar with the crossing conditions on the Narew.

PLAN FOR A COORDINATED ATTACK TO FORCE THE NAREW

The plan of attack was based on the only existing possibility, namely, to seize the crossing by surprise, on, under, and beside the bridge. This naturally required some time, as this area in particular was under heavily concentrated fire from rifles, machine guns, rifle grenades, and tanks.

A coordinated attack had to be planned: the 1st Battalion had to come up, deployment of all elements be completed, and preparatory fires by artillery and heavy weapons laid down.

Therefore, oral fragmentary orders were issued to continue the attack only after systematic preparation and after guarantee of the strongest possible artillery support, as well as support by one antitank battalion. The following forces were to prepare for the assault, south of the Narew:

Right Front: 3d Battalion with one L Inf How Plat, one AT Plat, and the 1st AT Co, all attached.

Left Front: 1st Bn with one L Inf How Plat, one Hv Inf How Plat, and the 2d AT Co, all attached.

Angriffsgruppe:* The former advanced detachment (Vorausabteilung), with its attached units, in its present position.

Regtl Reserve: 2d Bn with one L Inf How Plat attached. This force was to reconnoiter possibilities for attacking from a position in the western section of the woods northeast of Deniski.

The commanding hills north of the Narew bridge were designated as the next objective of the regiment.

The main mission of the artillery was to support the 3d Battalion and to prepare the attack by smashing the enemy in the fortified positions north of the bridge; furthermore, to smash enemy tank concentrations south of Ryboly, in the woords southeast of Wojszki, and at Wojszki.

A CHANGE OF PLAN TO MEET A CHANGE IN THE SITUATION (1130)

Toward 1130 the situation took a new turn. The aggressive power of the attacking elements was able to accomplish what had not been considered possible in view of the estimated enemy situation, defending as he was a fortified position, with increasing artillery support and strong tank forces held in readiness.

By exploiting the bold forward thrust of the assault guns, elements of the infantry--about 20 men of the 10th Company--and parts of the engineers had succeeded in pushing to the far bank on and under the bridge, forming a bridgehead and thereby initiating a sweeping general attack across the Narew by the attack group.

Toward 1130, the reports from the liaison officers who had been sent to the units then attacking, (the attack group and the 3d Battalion) revealed the following situation:

The liaison officer with the attack group realized, upon his arrival, that there had been a change in the situation since the issuance of the order for a coordinated attack. It now appeared possible for the forward movement to gain sufficient momentum for a successful assault without a coordinated attack. He hurried to take this important news to the regimental commander.

The liaison officer with the 3d Battalion delivered a message from the 3d Battalion Commander indicating that his attack was in progress, some units already had succeeded in pushing across the river, and could not now be stopped. The most advanced infantry was involved in stubborn close combat with the enemy in foxholes and small trenches. If reinforcements could come up soon, the attack was likely to be successful.

*Attack group.

It was now imperative to prevent the attack from stalling; this was the moment to press forward with all available strength.

A considerable element of danger was recognized in the fact that, during the sweeping continuation of the assault, the attacking force might run into its own artillery fire. However, efforts to shift the fire to a box barrage succeeded in time; later, it turned out that the artillery fire had been falling directly in front of the infantry and had greatly facilitated the attack.

The liaison officers with the attacking units were rushed forward with the new and final order to dispense with any preparation for a coordinated attack and to press the attack now in progress, with the hill north of Ryboly as the next objective (3d Battalion to the right of the road, 1st Battalion to the left of the road).

SUCCESS

The regimental command post was moved forward to the hill north of the Narew bridge. This was done at a moment when the most advanced elements, generally speaking, had cleared the enemy positions on the hill to the right of the road. There were one or two dead Russians lying in every foxhole; now and then, shots were still being fired by some individual Russians who obviously had simulated death. Parts of the 3d Battalion turned east so as to clear the grain fields of enemy riflemen; other elements fought their way into the wooded rolling country 500 meters north of the Narew bridge.

Only a few tanks were still resisting; they were disabled by the assault guns, and some of them were abandoned by their crews.

The enemy had been forced to give up his intention of defending, both by the fierce attack and by the effective artillery fire, which had caught the enemy motorized column at Ryboly and tank concentrations at Wojszki and in the reserve position in the woods to the southeast, as well as the enemy artillery. While the most advanced enemy riflemen and heavy weapons, supported by tanks, were holding out until the last, everything else was in full flight. Enemy riflemen approximately two companies in strength were observed northwest of Ryboly in scattered retreat (seemingly, the enemy infantry reserve). The enemy artillery left some single guns behind, in their emplacements; the rest withdrew from Ryboly to the northeast and, caught in the pursuit fire of the medium artillery, were abandoned by the enemy north of Ryboly.

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Comment: As in any contemporary account, based on incomplete records, one must allow here for the natural tendency to overestimate the achievement of friendly troops. The Russian strength is nowhere clearly indicated, and it would appear from the account that the German superiority in artillery was decisive, even against Russian tanks. Whatever the final judgement on this small engagement, it remains well worth study as an example of bold and rewarding offensive tactics in a difficult type of operation.