

FM 31-50

WAR DEPARTMENT BASIC FIELD MANUAL

ATTACK ON A FORTIFIED POSITION AND COMBAT IN TOWNS

RESTRICTED

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The information contained in restricted documents and the essential characteristics of restricted material may be given to any person known to be in the service of the United States and to persons of undoubted loyalty and discretion who are cooperating in Government work, but will not be communicated to the public or to the press except by authorized military public relations agencies. (See also par. 18b, AR 380-5, 28 Sep 1942.)

WAR DEPARTMENT BASIC FIELD MANUAL

FM 31-50

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ATTACK ON A
FORTIFIED POSITION
AND
COMBAT IN TOWNS



WAR DEPARTMENT • 31 JANUARY 1944

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WAR DEPARTMENT,

WASHINGTON 25, D. C., 31 January 1944.

FM 31-50, Attack on a Fortified Position and Combat in Towns, is published for the information and guidance of all concerned. Its provisions should be studied in conjunction with FM 100-5.

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(For explanation of symbols see FM 21-6.)

CONTENTS

PART ONE. ATTACK ON A FORTIFIED POSITION

	<i>Paragraphs</i>	<i>Page</i>
Chapter 1. General	1-3	1
Chapter 2. Permanent Fortifications		
<i>Section I.</i> General.....	4-13	2
<i>II.</i> Methods of defense.....	14-15	15
Chapter 3. Intelligence and Reconnaissance		
<i>Section I.</i> Special problems.....	16-18	19
<i>II.</i> Means available.....	19-23	21
Chapter 4. Capabilities of Weapons		
<i>Section I.</i> General.....	24	26
<i>II.</i> Cannon.....	25-26	26
<i>III.</i> Bombs.....	27	28
<i>IV.</i> Other weapons.....	28-31	30
Chapter 5. Special Artillery and Infantry Requirements		
<i>Section I.</i> Direct fire.....	32-37	37
<i>II.</i> Assault units.....	38-39	40
Chapter 6. Training	40	43

	<i>Paragraphs</i>	<i>Page</i>
Chapter 7. Conduct of the Attack		
<i>Section I.</i> General.....	41-45	44
<i>II.</i> Missions of other arms.....	46-54	47
<i>III.</i> Operations.....	55-60	51
<i>IV.</i> Coordination of attack elements.....	61-62	58
<i>V.</i> Summary.....	63	59

PART TWO. COMBAT IN TOWNS

Chapter 1. Characteristics

<i>Section I.</i> General.....	64-66	60
<i>II.</i> Tactical considerations.....	67	61
<i>III.</i> Special considerations.....	68-74	62

Chapter 2. The Offensive

<i>Section I.</i> Plans and supply.....	75-76	68
<i>II.</i> Infantry regiment and its supporting arms.....	77-78	70
<i>III.</i> Infantry battalion.....	79-81	74
<i>IV.</i> Rifle company.....	82-83	78
<i>V.</i> Rifle platoon.....	84-85	79
<i>VI.</i> Rifle squad and individual.....	86-89	81
<i>VII.</i> Illustrative problem.....	90	92

Chapter 3. The Defense

<i>Section I.</i> General.....	91-94	95
<i>II.</i> Infantry regiment and its supporting arms.....	95-97	98
<i>III.</i> Infantry battalion.....	98-100	101
<i>IV.</i> Rifle company.....	101	104
<i>V.</i> Rifle platoon.....	102-103	105
<i>VI.</i> Rifle squad and individual.....	104-105	107

Chapter 4. Training

<i>Section I.</i> Object.....	106	112
<i>II.</i> Methods.....	107-112	112
<i>III.</i> Stages.....	113-115	113

PART ONE

ATTACK ON A FORTIFIED POSITION

CHAPTER 1

GENERAL

1. PURPOSE. The purpose of this manual is to describe principles and methods suitable for the attack of a fortified position by land. (See FM 100-5.)

2. SCOPE. This manual discusses the characteristics of permanent fortifications and the methods of attacking such fortifications.

3. DEFINITIONS. A *fortified position* is a defense area which contains numerous steel or concrete defensive works. Depending upon its extent and depth, the position may be classified as a *fortified locality*, a *fortified line*, or a *fortified zone*. The defensive works usually consist of fortified weapon emplacements, or bunkers, and protected shelters, together with entrenchments and obstacles. However, major zones of permanent fortifications may include strongly organized groups of emplacements, shelters, and other underground installations.

CHAPTER 2

PERMANENT FORTIFICATIONS

SECTION I

GENERAL

4. ORGANIZATION OF FORTIFIED POSITIONS. a. Fortified positions are ordinarily disposed in depth, and organized for all around defense of component groups of fortifications. Many emplacements firing to the flanks and rear are protected and concealed from the front by defilade or mounds of earth covered with vegetation.

b. Emplaced weapons are sited to provide interlocking bands of grazing fire. Dead spaces may be protected by antipersonnel mines and covered by fire from individuals in foxholes.

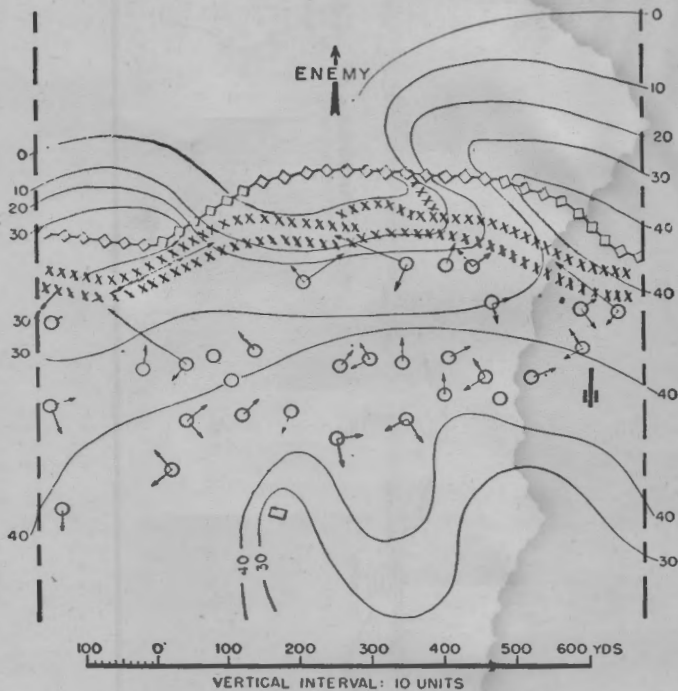
c. Fortified positions are protected against night attacks by artificial illumination and prearranged defensive fires, correlated with antipersonnel mines, wire entanglements, and other types of obstacles.

d. Fortified positions are protected against armored vehicles by systems of heavy antitank obstacles, antitank mines, and antitank weapons in armored emplacements.

e. Many fortifications are gasproof.

f. (1) Figure 1 shows weapons emplacements, wire, and antitank obstacles in a German fortified line which is part of the West Wall.

(2) Figure 2 shows a cross section of a fortified line in which the principal defensive element consists of em-



SYMBOLS

- → EMPLACEMENTS, DIRECTION OF FIRE KNOWN
 - EMPLACEMENTS, DIRECTION OF FIRE UNKNOWN
 - CONCRETE SHELTER, NO ARMAMENT
 - ⊥ MOBILE ARTILLERY POSITION
 - xxxxx WIRE
 - ◇-◇ A.T.K. OBSTACLES (5 ROWS OF DRAGON TEETH)
- NOTE: ENTRENCHMENTS NOT SHOWN

Figure 1. Portion of West Wall—plan.

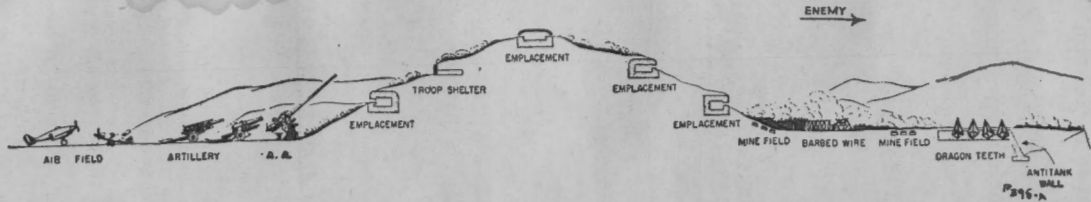


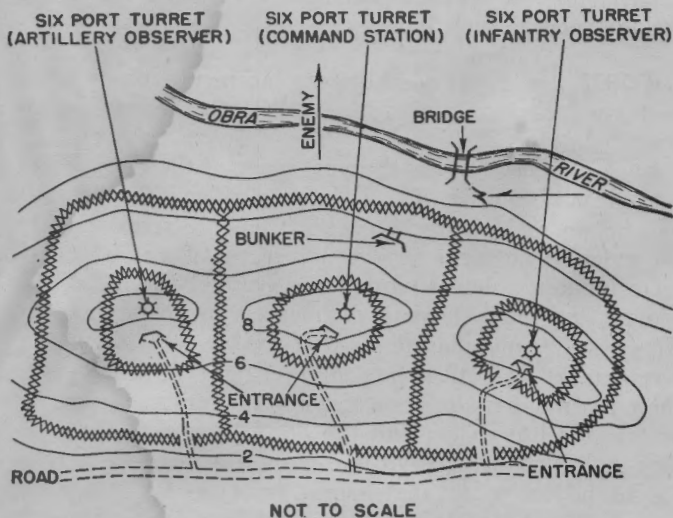
Figure 2. Fortified line—cross section.

placements. A major permanently fortified zone may include several such lines.

5. FORTS. a. Forts combine emplacements, observation posts, and shelters with tunnels and other protected installations.

b. A German fort on the west bank of the Obra River is typical. (See fig. 3.) It is on a ridge, 30 feet high, parallel to and about 200 yards from the river. Below the ridge, covering a bridge across the river, is a concrete bunker which is part of the system. Fields of fire around the ridge have been cleared of forest growth. Three well camouflaged six-port turrets are about 200 yards apart on high points of the ridge. In addition to their normal fire missions the middle turret is used for command observation and the flanking turrets for artillery and infantry observation. Each turret is surrounded by barbed wire entanglements from 50 to 100 yards away. The entrances are concrete, on reverse slopes 10 to 20 yards away from the turrets, and carefully camouflaged. Doors are protected by flanking machine guns in separate pill boxes which form part of the entrance. The fort, manned by 50 to 100 men, has all-around protection. Communication is by buried cables. Underground installations are shown in figure 4. The system is supported by two similar forts about 600 yards in its rear.

6. INFANTRY WEAPON EMPLACEMENTS. Machine-gun and other infantry weapon emplacements are the basic element in any fortified position. An emplacement has one or more embrasures from which the guns are fired, and sufficient protected space for the crew and ammunition. It may also provide living quarters for the crew. Such emplacements are commonly constructed of reinforced concrete but in some cases are made of steel. Concrete emplacements have the disadvantage of having

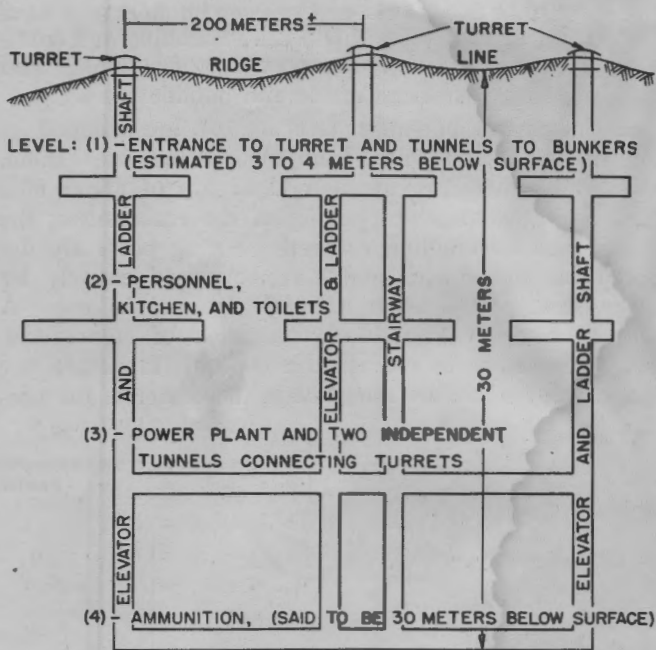


PLAN

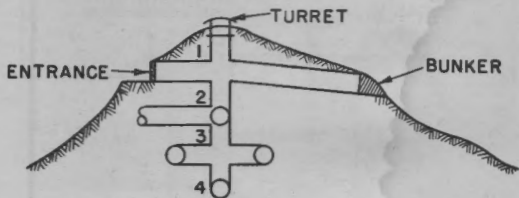
Figure 3. A German fort.

relatively high silhouette and wide embrasure openings. Embrasures may be simple openings or may be closed by steel doors or sliding panels. Steel emplacements may have the guns mounted in revolving turrets. Properly designed steel emplacements have low silhouettes and are relatively inconspicuous.

7. ARTILLERY EMPLACEMENTS. Antitank guns frequently, and field artillery pieces sometimes, are emplaced in fortifications usually together with machine guns. The installations are very similar to machine-gun emplacements except that field type guns require large openings from which to fire.



LONGITUDINAL SECTION, VERTICAL SCALE EXAGGERATED



CROSS SECTION. NOT DRAWN TO SCALE

DIAGRAMATIC NOT TO SCALE

Figure 4. German fort—sectional lay-out.

8. INDIVIDUAL BUNKERS. **a.** Concrete bunkers may have 5 to 10 feet of protective thickness. Scabbing and spalling of concrete will be reduced by use of sandbags and plastic or metal covering inside and outside the walls.

b. Embrasure openings (see fig. 5) are stepped to prevent small-arms fire from ricocheting into them. Most embrasures provide a field of fire of about 60° . The wider the angular opening of the embrasures, the weaker the surrounding concrete. Firing ports are designed for gun shields and may be closed entirely by heavy steel plates when weapons are not in use. A bunker or turret may have a number of embrasures, usually from one to six. In one type of embrasure, the weapon and shield are mounted in the center of the pro-

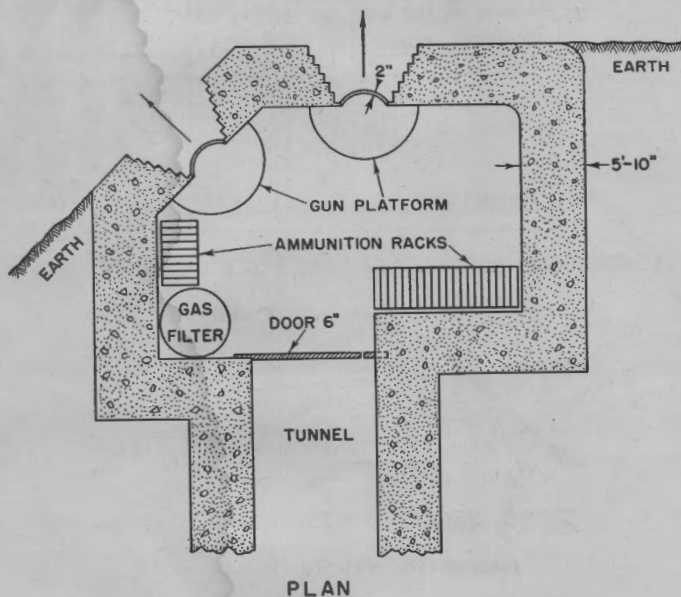


Figure 5. Typical bunker with two embrasures.

protective thickness, the opening being stepped-in to the point where the weapon is pivoted, then widened again to afford room for serving the piece. (See fig. 6.)

c. In some instances, particularly in larger bunkers, walls separate the interior into compartments in order to reduce casualties when direct hits are made on an embrasure opening.

d. Entrances, which may open into deep underground tunnels, often are at a considerable distance from the works. They are sealed by armor plate. In some cases the entrances are horizontal doors, level with the ground. Entrances frequently are double, for improved gasproofing.

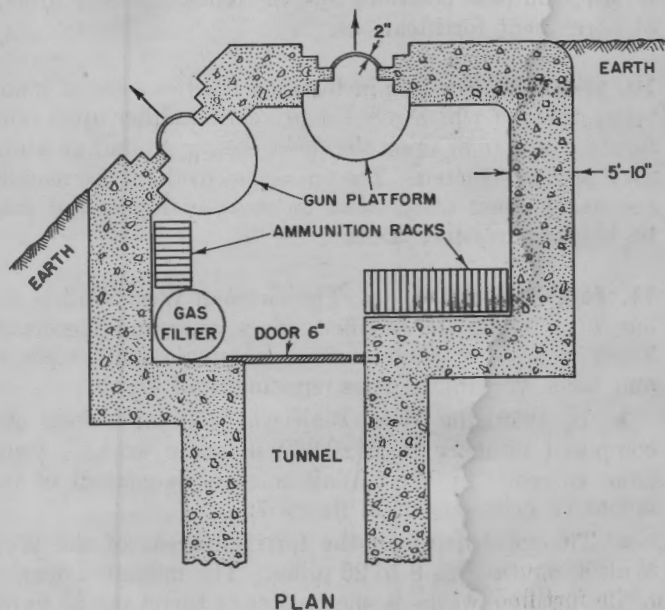


Figure 6. Typical bunker, alternate type embrasures.

e. Air intakes, usually multiple, are guarded by strong metal gratings.

f. High-tension electric wire may be used as a defense against patrols. The defender may use permanently installed, remotely controlled flame throwers to cover small critical approaches, and will have provisions for discharging grenades from the bunkers.

9. FIELD FORTIFICATIONS. Fortified positions normally include field fortifications such as intrenchments and open weapon emplacements. These works may be occupied continuously or they may be manned by troops who take protection from artillery fire and bombardments in nearby shelters. Field fortifications frequently are used for outpost positions and to connect lines or groups of permanent fortifications.

10. SHELTERS. Shelters in fortified positions are of many types, most of which rely for protection either upon reinforced concrete or upon the depth below ground at which they are constructed. The entrances to them are usually concealed along trenches or on reverse slopes, and may be blocked by steel doors.

11. FORTIFIED BELTS. a. The German West Wall is but one of a series of fortified zones guarding Germany. These zones are combinations of single emplacements and forts, varying in type, spacing, and depth.

b. In 1939, the West Wall was 350 miles long and composed of more than 22,000 separate works. From front to rear, the West Wall consists in general of the defensive belts shown in figure 7.

c. The total depth of the fortified areas of the West Wall is reported as 8 to 20 miles. The indicated density of the fortified works is one bunker or turret per 55 yards of front in each zone. The depth of the wall makes the

average distance between individual works about 165 yards. These distances vary considerably, intervals being less in the first belt, especially where the terrain favors the attacker.

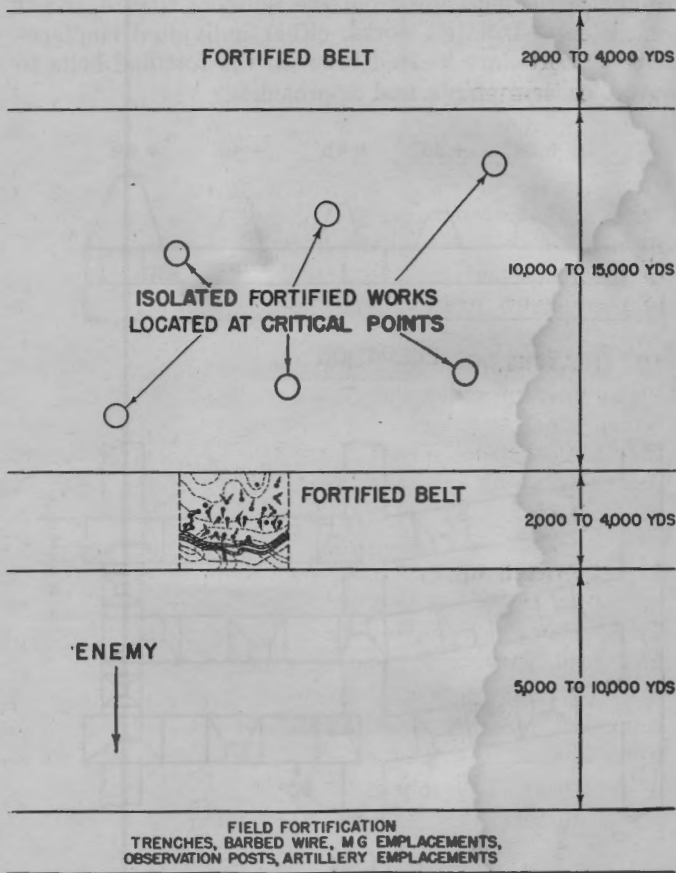


Figure 7. West Wall—schematic diagram.

d. The fortified belts are sited to give the defender the best possible fields of fire. These have been cleared of woods and vegetation affording cover or concealment to the attacker. The ground near the works has been so landscaped that ground defiladed from small-arms and automatic-weapons fire from the bunkers is rare, if not nonexistent. Isolated works, either individual emplacements or forts, are located between the fortified belts to protect critical points and approaches.

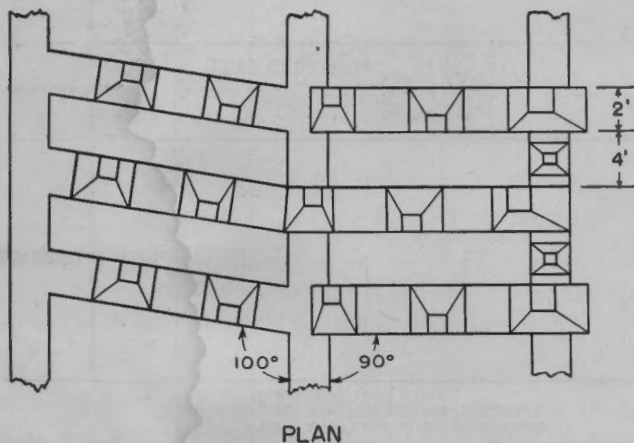
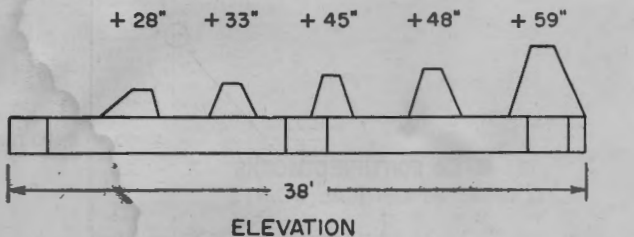


Figure 8. Dragon's teeth.

12. OBSTACLES. **a.** Tank obstacles may extend continuously along the front of the fortified zones, and within the belts of fortified works.

b. Where the terrain requires artificial obstacles, these may consist of dragon's teeth (see figs. 8 and 9), tank ditches, or similar obstacles, covered by antitank gun fire.



Figure 9. Dragon's teeth, showing four double rows.

c. Two other types of antitank obstacle occur occasionally in the German West Wall. One is a field of posts or tree trunks placed similarly to the dragon's teeth, about equivalent to our asparagus-bed type of post obstacles. The other is a steel rail obstacle (see fig. 10) with rails as high as 6 feet.

d. Antitank mine fields can be expected, especially in avenues of advance favorable to armored forces. They will be irregular, and in great depth. Many of the mines will be activated.

e. Wire entanglements are in thick belts 30 to 50 yards wide between antitank obstacles and defending bunkers. Additional wire often is interwoven in the antitank obstacles. Where no antitank obstacle exists, entanglements are placed within the most effective machine-gun range. Their usual height is about 3 feet. Often there are two bands of wire, each 30 feet wide, about 30 feet apart. German fences are densely laced with wire. Individual bunkers are surrounded by protective wire at a distance to prevent hand grenade attacks by the assaulting troops.

f. Within the obstacles, and throughout the wire entanglements and approaches, booby traps and other anti-personnel devices are placed.

13. OTHER FEATURES OF DEFENSE. Local reserves are held in protected shelters or dispersed in concealed intrenchments. In some cases they are shifted by under-

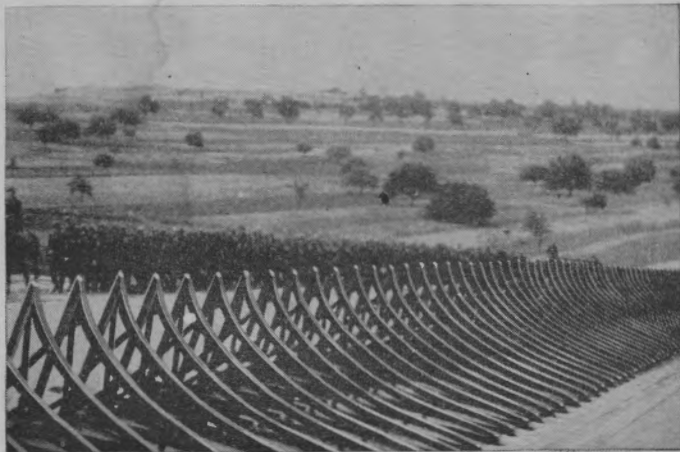


Figure 10. Steel rail obstacle.

ground passages. Ordinarily most of the field artillery is fired from normal type positions and not from fortified emplacements.

SECTION II

METHODS OF DEFENSE

14. THE GERMAN DOCTRINE. *To realize the pattern which the defense of fortifications probably will assume, the following points of German defense doctrine must be understood. This compilation, based chiefly on military attaché reports, may require revision in the light of more recent combat experience, but is believed to be generally correct.*

a. *A modern defensive system must take full advantage of terrain. The weakest terrain should be defended by the strongest and most numerous permanent works, placed in great depth. However, the relative defense effectiveness of terrain and of permanent fortifications must be judged carefully. No terrain should be entirely without the protection of fire from some permanent defensive works. The defended zone should be as uniformly strong as resources permit.*

b. *It is impossible to break through a modern fortification zone of permanent works without maximum heavy artillery support. Therefore, the defended zone must be deep enough to force the attacking artillery and its ammunition service to change positions during the attack. This reduces surprise effect, and gains for the defender valuable time which he must use in organizing his counterattack.*

c. *Since a single zone of uniform density deep enough to fulfill the above requirement cannot be built, two parallel defensive lines of maximum strength should be established, separated by a distance which insures maxi-*

imum disorganization and embarrassment to the attacking artillery. Between these zones must be permanent works which, although lacking density, are in such numbers and so placed as to make progress through them slow and difficult. This arrangement provides delay and maximum insurance against surprise.

d. Some permanent fortifications should be placed in a forward field fortifications zone for protection against enemy divisional artillery. According to German sources, the minimum caliber of artillery effective against concrete fortifications is one-tenth the thickness of the concrete covering.

e. The defensive strength of a fortification system depends upon the ability of individual bunkers to deliver continuous short-range flanking fire from automatic weapons, and to afford moral and physical protection, physical relief, and unlimited ammunition supply for the defending crews. These bunkers must be far enough apart so that enemy artillery fire directed at one will not hit another and so placed that all terrain is effectively covered by observation and fire. Their general arrangement must make it difficult for the enemy to discover centers of resistance and keep him in doubt as to where he should employ his heavy indirect fire.

f. Camouflage is important.

g. For efficient command control, a number of neighboring bunkers or turrets, connected by underground tunnels, are united into a group or fort to form a center of resistance in which the individual emplacements are capable of mutual support. This provides both tactical control and great tactical strength. This center of resistance should be provided with complete flanking fire. Where this is not possible within the group, additional bunkers are constructed for this purpose. The nerve center of the system is composed of the bunkers with maximum observation and fire power.

h. Small local infantry reserves are essential. They must be protected by strong overhead cover, and should be capable of shifting rapidly through underground tunnels to the area from which a counterattack is to be launched. As soon as the attacker has occupied any portion of the fortified zone, these reserves must strike him before he can consolidate his gain. The defender has the advantage of a coordinated observation system and a complete communication system. Also, he can bring his reserves into action fresh and without either the casualties normally caused by passing through an artillery barrage, or the time loss usually suffered in bringing reserves from the rear. If local reserves fail to break up the attack, reserves must be brought from the rear either by underground tunnels or by motor trucks moving on camouflaged roads. These reserves must have a thorough knowledge of the terrain.

i. In the initial stage of combat, most of the light and medium defending artillery is held in the forward zone of field fortifications, with counterbattery and counterpreparation missions. In the second stage of combat, after the defending artillery has been forced to displace and the enemy attack has reached the fortified zone, the defending artillery's mission is to concentrate maximum fire on the enemy infantry in order to prepare an effective counterattack. For this purpose, some permanently emplaced batteries in the fortified zone will be needed and they must have armor protection sufficient to withstand the heaviest enemy artillery fire. However, most of the defending artillery must be highly mobile in order to be employed for mass effect at the point where the enemy attempts a decisive attack. Artillery positions must be prepared throughout the defended zone. These positions must afford protection for both men and ammunition, and must be connected to previously established protected observation posts (usually

in armored turrets) by an underground communication system. Communication must be available for every situation.

j. The fortified zone must have sufficient antiaircraft artillery to reduce enemy aerial reconnaissance to the minimum, and to provide maximum aerial protection for friendly airplanes. Antiaircraft guns should be camouflaged with bushes and nets. Their crews and ammunition should have overhead cover.

15. MISCELLANEOUS. a. Tactically, all the following important considerations of defense are realized in the German type of permanent fortifications:

Skillful, utilization of terrain.

Complete coordination of fire.

Excellent observation for artillery fire.

Protection against hostile observation.

Obstacles against tank attack.

Secure flanks.

Full provision for counterattack.

Dependable communication system.

Separation of defensive zones to cause attacking artillery to displace forward.

b. Although air superiority is necessary to the attacker's success, the defender's air power seldom can be destroyed entirely.

c. Incorporation of water barriers into the defense makes more difficult the problem of the attacker. In many places the attack on fortified zones must include a river crossing. Defenses in flooded areas will include wire and antipersonnel mines in the water.

d. Well buried, dependable wire lines reduce the reliance upon radio. The defender can jam radio transmission with no loss to himself.

CHAPTER 3

INTELLIGENCE AND RECONNAISSANCE

SECTION I

SPECIAL PROBLEMS

16. GENERAL. The attack of a fortified position requires careful and thorough planning, since success may depend on such small details as the location or direction of fire of a single embrasure. For this reason intelligence must be strongly emphasized and no effort spared to obtain all possible information.

17. CAMOUFLAGE. **a.** The defender will camouflage the fortified areas thoroughly. Often this may change the appearance of large portions of the landscape. More important to the attacker, however, is the camouflage of small installations, such as the bunkers.

b. Bunkers are set into hillsides to make them harder to see and to damage. Exposed concrete faces are painted to blend with surrounding earth or shrubbery, and may be covered with camouflage screens. Natural growth is used for concealment wherever practicable. Bunkers may be inside houses, or houses may be built over them.

Others are disguised as haystacks or as grassy hummocks. Innocent appearing boulders may have embrasures. In some cases rocky hillsides have been cut away, and the opening covered by heavy mesh with artificial stones and camouflage paint on the outer surface; the change is not apparent from 100 feet away. Troop shelters may be entirely underground, the entrances being flush with the ground and covered by natural growth.

c. The exact nature of antitank obstacles may be concealed by screening.

d. False embrasures may be painted on visible bunkers to mislead the attacker as to their fields of fire. True embrasures may appear as flat concrete walls. In most cases embrasures will remain closed until the moment of use, to conceal the type of weapon firing from them.

e. Communication trenches will be covered or may be entirely underground.

18. MISCELLANEOUS. a. Underground passages give the defender great local mobility. Weapons may be shifted from one location to another. The many alternate weapon positions in the field fortifications adjoining the forts will serve as decoy positions when not occupied. Decoy artillery positions may exist in large numbers.

b. Several factors lessen the efficiency of the attacker's ground observation. In addition to the camouflage measures mentioned above, the defender will so locate the fortified belts as to deprive the attacker of terrain advantageous for observation. The fact that much of the defensive installation is underground will add to the difficulties of observation. Since his fire plan is prearranged and he has azimuth instruments in the bunkers and turrets, the defender is more independent of observation than the attacker and may be expected to use smoke freely.

SECTION II

MEANS AVAILABLE

19. GENERAL. a. The search for information is a continuing process. Before contact is established, and before the outposts have been driven in, air reconnaissance must be depended upon for most of the necessary intelligence. As contact is made with the fortifications, reconnaissance is intensified and detailed ground reconnaissance is undertaken.

b. In addition to the usual information of hostile troops and terrain certain elements of information should be known to the attacker. Among these are:

- Location, strength, and type of all defenses.
- Location of all entrances and exits.
- Calibers and types of fixed weapons.
- Direction of fire from all embrasures.
- Degree of underground organization.
- Thickness of steel and concrete in the works.
- Defiladed approaches in foreground of position.
- Positions for direct-fire guns.

20. GROUND RECONNAISSANCE. a. Observation must be continuous, and estimates revised as air or artillery bombardment reveals additional information. Changing shadows sometimes disclose details of construction. Close study must be made of any terrain feature capable of concealing a bunker. Often, measurements of visible portions of an installation and close inspection of the surrounding ground forms will reveal the work as a standard type. Information as to additional embrasures and thickness of walls may be acquired in this way.

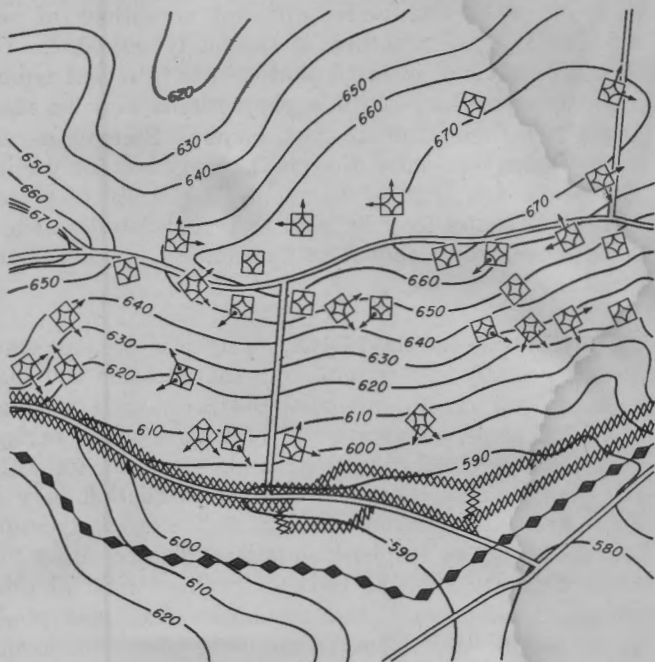
b. Patrols are used aggressively and seek detailed information within their areas of reconnaissance. This



Figure 11. Aerial view of a portion of the West Wall during construction, showing shapes of emplacements.

may include information of the obstacles and of the works near the forward edge of the area, areas where obstacles are not continuous or are not effectively guarded, locations of actual and dummy works, sectors of fire of weapons and dead space in their fires. All hostile reaction, particularly the location and direction of fire of defending weapons, is recorded.

- 21. AIR RECONNAISSANCE.** **a.** Aerial photography will provide the attacker with large amounts of information.
- b.** Aerial photographs must be constant and systematic. (See figs. 11 and 12.)



LEGEND






- 
EMPLACEMENT - GENERAL
- 
EMPLACEMENT - DIRECTION OF FIRE KNOWN
- 
M.G. EMPLACEMENT - DIRECTION OF FIRE KNOWN
- 
BARBED WIRE
- 
DRAGONS TEETH

Figure 12. Diagrammatic interpretation of figure 11.

c. The use of successive photographs taken at various time intervals, and under different conditions of season, lighting and weather, is especially valuable. Use should be made of infrared photographs to reveal camouflage screens. Low-altitude photographs may be made at night by use of photo-flash bombs. Stereopairs and vectographs, especially those that exaggerate the vertical dimension, are of great value in close study of ground forms. Obliques may be used to reveal details, such as embrasures, which cannot be detected by vertical photographs.

22. ENGINEER INTELLIGENCE. Engineer reconnaissance seeks especially to determine the exact location and character of terrain and artificial obstacles such as mines and tank traps, emplacements, and approaches, bridges, and routes of communication within the area, for which engineer clearing, supplies, and reconstruction may be required. Vital information such as the exact structural characteristics of emplacements is evaluated using previous War Department reports together with all other available intelligence and reconnaissance, and placed in the best possible form for the using troops which time permits. Where possible, an accurate map is desirable showing the direction of fire from embrasures and the type of friendly weapon required for breaching.

23. MISCELLANEOUS. a. Preparation fire by artillery, in addition to the possibility of destroying some of the works, may contribute to intelligence in the following ways:

- (1) It dislodges camouflage screens and covering, disclosing embrasures and other construction details.
- (2) It blasts away earth covering the bunkers, revealing their shape and type.

b. Judicious use of smoke, combined with patrol and artillery action, may cause the enemy to lay down and thus disclose his final protective fires.

c. Elaborate feints may be employed to draw out the defense. These may take the form of artillery action, infantry action, or both. An artillery preparation may be fired to learn the pattern of the counterpreparation, and to locate hostile batteries. Direct-fire guns may fire on the works and infantry may attack. When hostile reaction has disclosed the desired information, the operation may be suspended and the plan of action revised in accordance with what has been learned of the defenses.

CHAPTER 4

CAPABILITIES OF WEAPONS

SECTION I

GENERAL

24. DEVELOPMENTS. Continued tests of old and new weapons will make available new and more accurate information. Therefore, figures quoted here as to capabilities of various weapons must be accepted merely as indicative.

SECTION II

CANNON

25. GENERAL. Portions of modern fortifications vulnerable to ordinary cannon fire usually are so small as to be difficult to hit at long ranges. Therefore, certain weapons, especially cannon which are effective against concrete and steel, must be emplaced to fire at short ranges.

26. CAPABILITIES OF CANNON. a. The armor-piercing projectile of the 37-mm antitank gun, at ranges from 500 to 800 yards, may pierce 2 inches of steel or about 1½ feet of concrete. The cumulative effect is small. Under

favorable conditions, from 50 to 80 rounds will pierce a 5-foot concrete wall. Normally, the gun is used for neutralization, its fire being directed into embrasures to disable the weapons within, and also to jam sliding parts and traversing mechanisms.

b. Penetrations for weapons listed below are at a range of 1,000 yards.

c. The 57-mm antitank gun is heavier than is needed for neutralizing embrasures, and is lighter than is desirable for destruction of concrete. However, it is the lightest weapon which is capable of sufficient sustained rapid fire for neutralization, and for damaging concrete appreciably. It can pierce 2.8 inches of steel, and will perforate slightly less than 2 feet of concrete. It requires about 35 to 45 rounds to pierce a 5-foot concrete wall.

d. The 75-mm gun of the medium tank can pierce 3.0 inches of steel and about 2 feet of concrete. The cumulative effect is considerable, 30 to 40 rounds being sufficient to pierce a 5-foot wall. However, only the AP shell is effective; the HE shell has little effect on heavy concrete. The muzzle velocity of the 75-mm howitzer is too low to make its use with AP shell advisable, but using the HE-AT shell, it can pierce 4 inches of steel and may pierce a foot of concrete. The cumulative effect of this shell is small. It may be used to neutralize embrasures, but only as a last resort to destroy heavy concrete.

e. The 3-inch gun of the tank destroyer units, using either AP or APC (with explosive charge) ammunition, can penetrate 4.0 inches of steel and about 3 feet of concrete. The cumulative effect is marked. From 10 to 16 rounds will pierce a 5-foot wall.

f. The 105-mm howitzer, either M2 or M3, using the HE-AT shell, can pierce 5 inches of steel, and will perforate 1 foot of concrete. There is appreciable cumula-

tive effect, especially against thin concrete walls, which have a tendency to disintegrate after a few shots; against heavier walls the effect is less pronounced. It requires from 20 to 35 rounds to pierce a 5-foot wall. The HE shell has little effect against heavy concrete or steel.

g. The 4.5-inch gun has no AP ammunition. This makes it an inappropriate weapon for close-range firing against fortifications.

h. The 155-mm gun M1, firing HE shell, delay fuze, will blow a crater about 2 feet deep in heavy concrete. The AP, or APC (with explosive charge) shells will penetrate from 5 to 6 feet of concrete. The GPF, with its somewhat lower muzzle velocity, will perforate 5 feet of concrete. One round is sufficient to pierce a bunker with 5-foot walls and to damage the interior considerably.

i. Cannon of heavier calibers are effective against steel and concrete and in some cases may be required, but their vulnerability and lack of mobility make them unsuitable for close-range work.

j. Antiaircraft weapons give good results, but their carriages generally are more difficult to emplace than comparable field mounts. The 37-mm and the 40-mm weapons are nearly equally effective. The high rate of fire of these weapons is advantageous, but may be more than offset by decreased accuracy when automatic fire is used. The 90-mm weapon, using AP shell, will pierce a 5-foot wall in 8 to 10 shots. Consequently, it is a highly effective weapon for close-range fire against forts.

SECTION III

BOMBS

27. EFFECT. **a.** For perforation of concrete and armor plate by various type and weight bombs, see table I.

The figures in table I, based on tests against 3,500 pounds-per-square-inch concrete, show the maximum limits of *perforation* for the bombs listed.

b. The cratering effect of GP bombs on soil is impor-

Table I. Bomb perforation

Bomb weight	AP bomb concrete	SAP bomb concrete	GP bomb concrete	AP bomb armor plate
<i>Pounds</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Inches</i>
250			2.2	
500	6	5.0	3.0	5
1,000	8	6.5	4.0	8
2,000	10		5.0	10

Table II. Bomb craters

Weight of of bomb	Depth of crater	Diameter at surface	Material displaced
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With instantaneous fuze

<i>Pounds</i>	<i>Feet</i>	<i>Feet</i>	<i>Cubic yards</i>
100	2	9	4
250	3	13	10
500	5	17	17
1,100	6	20	28
2,000	7	22	47

With delay fuze

100	5	20	30
250	7	27	70
500	10	37	170
1,100	13	45	320
2,000	17	50	600

tant because of the effect of large craters on the fields of fire of weapons in fixed fortifications and the cover afforded the attacker. Table II, for bomb craters in sandy loam soil, is based on tests in which the terminal velocity of the bombs approached a maximum. The effect of the 1,000-pound bomb is approximately the same as the listed effect of the 1,100-pound bomb used in these tests.

SECTION IV

OTHER WEAPONS

28. SMALL ARMS. The effect of small-arms fire on heavy concrete is negligible, except that small-arms fire into and near embrasures may have a temporary neutralizing effect because of the concrete dust and small particles thrown about. At 100 yards, the caliber .30 bullet will pierce $\frac{5}{8}$ -inch mild steel armor plates; the caliber .50 bullet, 1.25-inch similar plates. The latter bullet is especially effective if fired in large numbers into embrasure openings. Sliding metal partitions may be jammed by the welts raised at the points of impact, and appreciable damage may be done to angle irons protecting embrasure corners and edges, to traversing racks, and to the weapons in the embrasures.

29. ARMOR PIERCING ROCKETS AND GRENADES. a. The antitank rocket M6A1 will pierce 3 to 4 inches of armor plate. Its performance is not affected materially by an angle of impact up to 40° . Being small and portable, it is suitable for inflicting casualties by close-in-fire at embrasures, but not for neutralizing embrasures which cannot be hit directly. It perforates 8 to 13 inches of concrete, but the hole is small and the cumulative ef-

fect is negligible. If the rocket strikes in the immediate vicinity of an embrasure, the resulting cloud of smoke and concrete dust has a blinding effect lasting several seconds.

b. The high-explosive antitank grenade M9A1 will pierce at least 2 inches of armor plate. It has a more highly curved trajectory than the AT rocket. Hence, effective fire against embrasures is unlikely beyond 40 to 50 yards.

30. FLAME THROWER. **a.** The portable flame thrower weighs about 68 pounds loaded and is carried and operated by one man. The tactical range and time of burst depend upon the type of fuel used and the wind conditions. An experienced operator can adjust for most wind conditions. With thin fuel, such as gasoline or fuel oil, the effective range is 15 to 25 yards in calm air with a sustained burst of 12 to 15 seconds. With thickened fuels, such as gasoline with chemical admixture (NaPalm), the effective range is 25 to 35 yards with a duration of discharge of about 10 seconds. The flame thrower may be fired in 10 to 15 short bursts of 1 or 2 seconds duration. (See figs. 13 and 14.)

b. The tanks on the operator's back made a conspicuous silhouette when he is prone, and he requires shell holes or other depressions for concealment between rushes as he moves forward. (See fig. 13.) The flame thrower is an effective weapon for the last-minute, close-in protection of a man or men placing the breaching charges or for mopping up the bunker after it has been breached. One principal advantage of this weapon is that the flame and smoke spread when they hit, fill the embrasures, and pour into ports and other openings, while the operator can stand at an angle from which he cannot be seen from within the embrasure.

c. The thickened fuel clings in embrasures and on vertical surfaces, where it burns for an appreciable period—

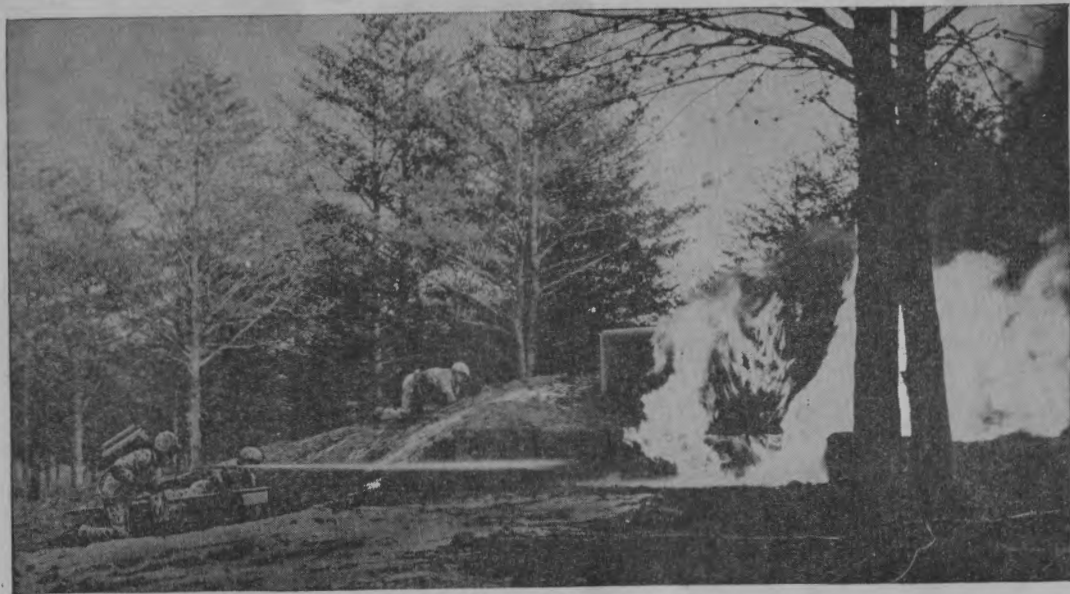


Figure 13. Flame thrower covering advance of demolition man.

6 to 8 minutes. It has, however, less blinding effect than the short range (thin) fuel, since its output is a stream, rather than a mass of flame, and its smoke is less dense. The heavier burning fuel also has less tendency to turn corners and to seep through small openings.

31. HAND-PLACED EXPLOSIVE CHARGES. a. The hand-placed explosive charge may be used to reduce any fortifications which the assault unit can approach. When the charge is placed, a short delay fuze or a standard-delay fuze is ignited, and the assault unit takes cover while the charge goes off. Repeated heavy charges will breach the strongest parts of any fortification, but ordinarily the charges are placed in embrasure openings, or against doors or other weak points. The explosive charge is the standard means of destroying works which cannot be reduced by direct fire of artillery. The hand-placed explosive charge may be a "satchel" charge—



Figure 14. Flame thrower in action.

either the standard chain demolition block, or one made up of a number of blocks of explosive tied together, capped and fuzeed, and ready to be fired. (See fig. 15).

b. The specially designed beehive-shaped charge shown in figure 16 is an enormously powerful penetrating weapon. The conical-shaped base provides a powerful directional effect along the longitudinal axis of the charge. The 10-pound charge will perforate $2\frac{1}{2}$ to 3 feet of concrete, with great effect of blast and flying concrete on the far side. It also will perforate as much as 12 inches of homogeneous armor plate with a hole about 1-inch in diameter.

c. A pole charge consists of explosive tied at the end of a pole so it can be placed at the door or the embrasure from a short distance away. (See fig. 17.) In figure 13, the charge placer is shown awaiting the completion of the flame thrower's work. He places the charge, ignites a short-delay fuze, and immediately takes cover.

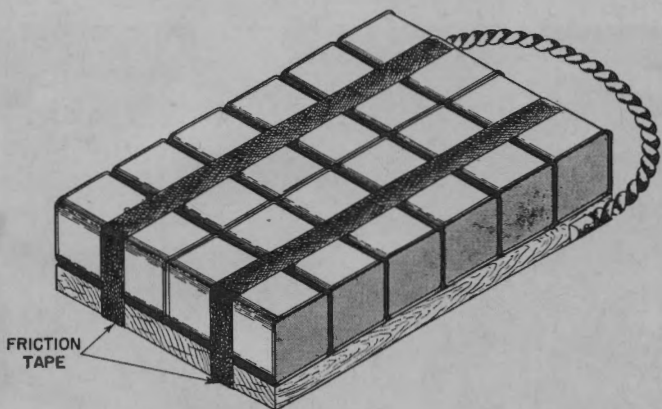


Figure 15. Improvised satchel charge.

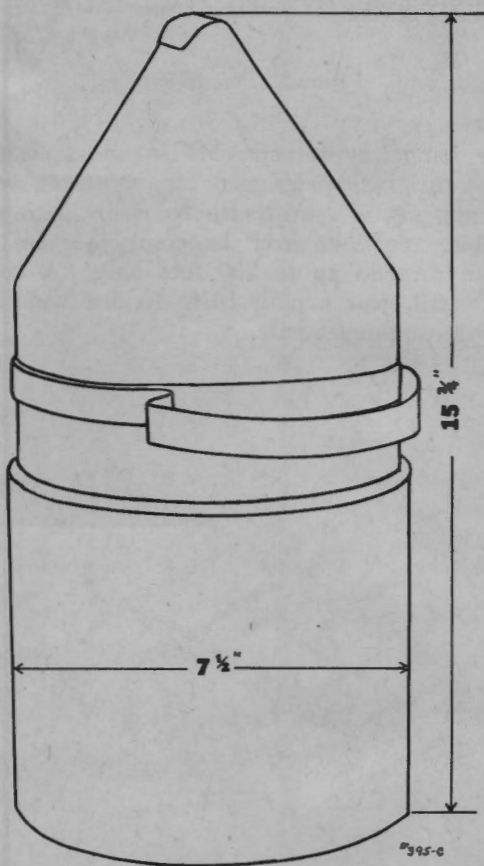


Figure 16. Beehive charge.

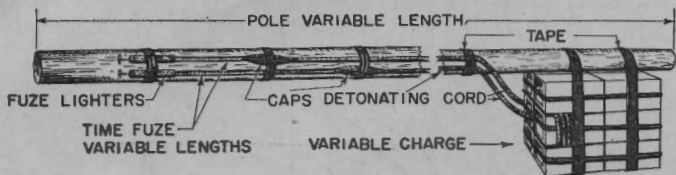


Figure 17. Pole charge.

d. The bangalore torpedo M1 is an explosive-filled steel tube, originally designed for breaching wire entanglements. It is useful also to clear lanes through mine fields. Sections may be connected end to end to form a torpedo up to 200 feet long. A length of bangalore will clear a path 10 to 15 feet wide through heavy wire entanglements.

CHAPTER 5

SPECIAL ARTILLERY AND INFANTRY REQUIREMENTS

SECTION I

DIRECT FIRE

32. GENERAL. a. Direct-fire weapons neutralize the permanent works by direct fire into the embrasures. Neutralization of the defender's forces outside the permanent works is maintained by indirect-fire weapons and the small-arms fire of the attacking echelons.

b. Direct fire should have the following characteristics: flat trajectory, to insure projectiles being placed well into the embrasure openings; high striking velocity, to increase the probability of destruction; and accuracy.

33. SELECTION OF POSITIONS. a. Normally, direct-fire positions should be within 1,500 yards of their targets; closer, in the case of light weapons such as the 57-mm gun. In the ideal position, the gun is defiladed, or at least screened, from all other works than that on which it is to fire.

b. Positions should allow fire to be perpendicular, or nearly so, to the walls of the bunkers. This decreases the number of ricochets and insures maximum destruction and early perforation. However, positions in the

dead angles of embrasures furnish a degree of security and are satisfactory if fire can be directed into the vulnerable corners of the embrasures.

34. ORGANIZATION OF POSITIONS. Positions to be occupied should be dug in before occupation. It may be necessary to bring up and conceal ammunition before the positions are occupied. A referred deflection should be recorded or a marker should be set at each position to permit laying the gun approximately on the target when conditions limit visibility.

35. OCCUPATION OF POSITION. Positions normally will be occupied under cover of darkness, smoke, fog, artillery fire, or any combination thereof. Concealed routes to positions should be used. Every precaution must be taken to keep direct-fire weapons undiscovered by the defenders until the weapons open fire.

36. CONDUCT OF FIRE. **a.** Soon after attacking weapons have opened fire their targets will be hidden by clouds of smoke and concrete dust. For this reason it is necessary that, as soon as a satisfactory adjustment has been obtained, the direct-fire weapons be referred to an auxiliary aiming point. It is also necessary that the adjusted elevation be measured and recorded so that fire may be continued, using indirect fire methods if necessary. Each round is laid carefully to limit dispersion, since the destructive effect is a result of close patterning. The rate of fire depends upon such factors as the length of time neutralization must be maintained, the time when perforation should be accomplished, the ammunition supply, and the prospective hostile reaction.

b. Usually it is difficult to tell when perforation has been accomplished. Perforation is sometimes indicated, however, by jets of smoke and dust from embrasures or

openings other than the one under fire, by a marked decrease in the cloud of smoke and dust at the point of impact and, if HE shell is being used, by the apparent absence of detonation. The explosion of a shell inside heavy works has a noticeably hollow sound.

c. The most vulnerable targets are the embrasures or the concrete surfaces near them. Fire should be directed at the base of steel turrets. The HE-AT ammunition should be used against steel, since ordinary AP shot usually ricochets from the surfaces of small steel turrets.

d. The use of tracer ammunition is helpful.

37. TACTICAL CONSIDERATIONS. a. When conditions permit, at least two weapons should fire on each embrasure which, if not neutralized, will hold up the advance. If too many weapons are used against the same target, difficulty will be experienced in obtaining proper adjustments.

b. When fire is directed against bunkers sited for flanking fire or fire to the rear, which have no embrasures into which the attacker may place his fire, heavier weapons are used, since results are obtained only by perforating the bunker.

c. Each weapon is initially given a specific mission in direct support of a particular subordinate unit.

d. All means of communication must be employed to insure that fire from the direct-fire guns can be lifted as needed. Usually it is lifted from each bunker as soon as the attacking infantry is ready to assault. Other fires must be maintained. Guns, the fire of which has been lifted, are held in position ready for immediate resumption of fire if the infantry assault fails. Usually two or more direct-fire guns will support the advance of a rifle company. Close liaison is maintained with the rifle company commander to render prompt and

close support to the rifle elements. Guns are displaced forward as required and as the situation permits.

e. Direct-fire heavy artillery should not be used in the initial fire plan to neutralize fire from the works. The direct-fire heavy artillery should be moved into position only after a high degree of neutralization has been established by the smaller guns. Their great destructive ability may then be brought into play with a reasonable degree of security.

SECTION II

ASSAULT UNITS

38. GENERAL. a. No plan of direct fire, however thorough, can be depended upon to overcome completely the resistance in a fortified area. There will seldom be any assurance that all works will be destroyed and, even though destroyed, a bunker may be reoccupied and rearmed. Moreover, emplacements, defiladed from direct fire can be destroyed only by assault. The attacker, therefore, must always close with and occupy the fortification, and in order to cope with such strongly organized defenses, attacking units must be reinforced with additional armament.

b. Ordinarily a division assigned the mission of attacking a fortified zone acts as part of a larger force. Reinforcements for the division may include engineer, artillery, armored, tank destroyer, antiaircraft artillery, signal, and chemical warfare troops and certain special equipment. The mission assigned the division is to breach the fortified position and extend the gap. Frontages are less than in the attack of hastily organized positions, and may be as narrow as 400 yards per assault battalion. The attack orders are detailed and as complete as possible.

39. ORGANIZATION. a. Assault infantry battalion.

The assault infantry battalion may include infantry cannon, and is supported by flat trajectory high-velocity guns. These may include tank destroyer and antiaircraft weapons and tank guns. Engineers from the division engineer battalion are attached. They may be utilized for demolitions and for other engineer missions, particularly in breaching obstacles and in assisting the prompt advance of direct-fire guns. Extra communication facilities and personnel are desirable.

b. Assault infantry company and platoon. The assault infantry rifle company is reinforced with necessary special equipment and supported by direct-fire weapons in accordance with the number of fortifications within its zone of action. An engineer platoon may be attached. The assault infantry platoons are issued special arms and equipment. A rocket team and a light machine-gun squad are attached usually. The platoon, in turn, may organize one or two of its squads for assault missions, usually retaining the remaining squad, or squads, as infantry support. In general, the platoon will organize at least one such assault squad, specially equipped, and trained in the use of demolition and flame-thrower equipment.

c. Assault squad. (1) For an assault of a position based largely on concrete and steel weapon emplacements, a suitable organization for an assault squad may be as indicated below. However, the size of the various indicated parties, as well as the variety of weapons or of special equipment, may be varied to meet the needs of particular situations.

(2) Since assault squads are organized for special requirements, neither their strength nor their armament should be considered fixed. The presence of large quantities of wire and antipersonnel mines may require that the wire-cutting party be increased. Extensive de-

molition requirements may necessitate a larger demolition party. Certain conditions may favor the use of a flame-thrower party or parties. In every case the needs of the situation will dictate the size, armament, and equipment of the detachment. The assault squad organization shown in table III will serve for basic training and for a framework on which to build.

Table III. Assault squad

	Arms and equipment												
	Number	Small Arms			Bangalore torpedo (5-foot sections)	Wire cutters	Demolition charges	Launcher, rocket, AT	Rocket, AT	Grenades, hand	Launcher, grenade M7 and grenades, AT	Signal equipment	Flame thrower
		Rifle, automatic	Rifle M1	Pistol carbine									
Leader.....	1		x							x		x	
Demolition party.....	2		x				x			x			
Flame thrower.....	1			x						x			x
Rocketeer.....	1			x				x	x	x			
Assistant rocketeer.....	1		x						x	x			
Wire cutting party:													
Assistant squad leader.....	1		x			x				x	x	x	
Automatic rifleman.....	1	x								x			
Assistant automatic rifleman.....	1		x							x	x		
Riflemen (wire cutters).....	3		x		6	3				x	x		

CHAPTER 6

TRAINING

40. GENERAL. a. Training for the attack may be divided into technical training and rehearsals. Technical training is training in the special technique and use of weapons. Rehearsals comprise the special training for troops detailed to attack a specific area.

b. When possible, troops will rehearse until letter-perfect on ground similar to that over which the attack will move, including simulated enemy works. Rehearsals should not rob the troops of initiative and flexibility, since craters on the battlefield and the inability to represent exactly the enemy works on the training ground will require adaptability to the actual situation during combat. Training and coordination of all troops concerned are perfected during rehearsals.

CHAPTER 7

CONDUCT OF THE ATTACK

SECTION I

GENERAL

41. CONDITIONS FOR SUCCESS OF ATTACK. a. When, because of secure flanks, the isolation of a fortified position by an initial enveloping maneuver is impossible, it must be reduced by a direct attack which breaks through at a weak point. The break-through is followed by envelopment of the shoulders of the penetration to isolate the separate parts of the position.

b. The principal differences that distinguish the break-through of a fortified position from the penetration of any other hostile position are the relatively greater special training and combat superiority required, the thoroughness of preparations, the types of special equipment required, the narrow frontage subjected to initial assault, and the action subsequent to the break-through or involved in the isolation of fortified localities.

42. PHASES OF ATTACK. a. The attack of a fortified position may be divided generally into four phases. In application, related phases may overlap, particularly on weaker parts of the front. Immediate exploitation of the success of each phase is imperative. These phases are:

- (1) Reducing the hostile outpost system and developing the main position.
- (2) Breaking through the fortifications at the most favorable point.
- (3) Extending the gap by isolating and reducing hostile emplacements on its flanks.
- (4) Completing the action by moving mobile reserves through the gap to complete the encirclement and isolation of the remaining fortifications while continuing the attack against them from the front.

b. If the position consists of two or more fortified lines established in depth the attack must proceed to the second line as soon as possible after breaking the first.

43. FINAL PLANNING. **a.** Final planning and organization occurs after development of the fortified position on a wide front. The plan prepared at this time includes the exploitation phase. In order to obtain surprise, the interval between development and break-through should be as short as possible. During the development phase, while troop and matériel concentrations are completed as expeditiously as secrecy will allow, additional aerial photographs are obtained, studied, and disseminated, and final plans are made and orders issued by all echelons. All elements of the command are briefed thoroughly with both general and detailed plans for the operation.

b. The order issued before the action prescribes in detail the initial objectives, the signals to indicate success in initial missions, and the next objectives for each assault unit. Plans to shift supporting fires to their respective second targets are prearranged. Unforeseen contingencies require that plans be flexible and that the assaulting elements react promptly to changes in the situation. The signal plan must provide for rapid communication between the various elements of each assault infantry battalion.

44. USE OF SMOKE. Smoke may be used to screen the entire front to cover the movement of troops into position, to screen one or both flanks of a gap created by unequal advance of units, to screen an area outside of the immediate action, and to screen observation posts and fortifications that can not be neutralized by other weapons. Consideration should be given to the use of smoke to cover the approach of assaulting troops even though the approach is made during darkness, to counter the possible use of illuminating flares by the enemy. The use of smoke must be coordinated with the need for direct fire and ground observation.

45. NIGHT OPERATIONS. a. When preparatory fires have been successful and considerable damage has been accomplished in the hostile forward area, a night attack may be launched. Direct-fire guns are employed against emplacements within their maximum effective range during the day preceding the attack.

b. The objective of the attack is a terrain feature, the capture of which will provide for the assault echelon a defensive position with defilade for the forward displacement of weapons.

c. Consideration should be given to the use of searchlights to illuminate targets for direct-fire weapons. Ground flares projected to the immediate front of bunkers may be profitable. Maintenance of direction by assault elements is assisted by the firing of tracers on the flanks.

d. The attack is initiated in time to provide the assault units sufficient darkness to dig in on the objective and arrange for the close defensive fires of supporting weapons before daylight. Direct-fire guns must likewise be displaced and dug in prior to daylight. Tanks are brought forward or made immediately available to assist in breaking up counterattack. Continuation of the attack will be made usually by a passage of lines by fresh units.

e. Where no terrain feature exists as an objective, the attack will be limited by the requirements of displacing and digging in the direct-fire guns. The objective will usually not be beyond the second echelon of bunkers. The attack will be resumed at daylight since the assault elements will be under the fire of succeeding echelons of bunkers and on terrain disadvantageous for defense.

SECTION II

MISSIONS OF OTHER ARMS

46. GENERAL. The missions of arms other than infantry are summarized in the paragraphs below.

47. AIR FORCE. a. The primary mission of the air force is to maintain air supremacy, but it contributes directly to the attack by supplementing the artillery counter-battery fire and by attacking enemy reserves. Dive bombing usually is ineffective against fortifications because of the difficulty of identifying individual works from the air and because of the probable strong anti-aircraft defenses. Area bombing, especially in zones where the works are closely grouped, may produce good results by destroying or tilting bunkers, jamming turrets with near misses, disrupting the fields of fire with large craters, and by shock action on defenders outside the works.

b. Air superiority must insure that our bomber and reconnaissance aircraft can, without undue losses, bomb and observe the lines of communication behind the fortified position, while enemy aircraft are unable to operate effectively over our lines without prohibitive losses. Interference with concentration and movement of enemy reserves prior to and during the attack, and close support

of exploitation forces during and after the break-through, are zone-of-contact missions.

48. AIRBORNE UNITS. Airborne units may be used against defensive rear areas only when the break-through is accomplished or assured, since they require early reinforcement by ground troops.

49. ANTI-AIRCRAFT. **a.** Antiaircraft artillery may be used for direct fire against fortifications. The primary mission in such case is direct fire on the works. They do not revert to their normal role until the need for direct fire has passed.

b. The gap formed by a successful penetration must be regarded as a defile and given antiaircraft protection accordingly.

50. ARMORED UNITS. The employment of armored units in the early stages of an attack on fortifications usually is inadvisable, since the obstacles, mine fields, and emplaced antitank weapons of the defender greatly restrict the mobility of tanks. They will find their best employment in exploiting a break-through. Tank units may be used for direct fire in support of the infantry attack. However, the probability of loss demands that such employment be made only when tanks are in sufficient numbers to permit the holding of an exploiting force in addition to the direct-fire tanks.

51. FIELD ARTILLERY. **a.** Types of artillery fire are:
(1) **INDIRECT FIRE.** The bulk of the available artillery supports the attack by indirect fire under centralized control to enable the massing of fires on critical areas.

(2) **DIRECT FIRE.** Assaulting troops must be closely supported by direct-fire weapons. Field artillery may be

called upon to furnish these weapons. The 105-mm howitzer, either M2 or M7 carriage, firing HE-AT ammunition, and the 155-mm gun on the M12 carriage, can be used for this purpose, providing more suitable types are not available. In general, field artillery weapons are not suitable as direct-fire weapons because of their relatively low muzzle velocity. In many cases where an emplacement cannot be destroyed, it can be neutralized by hits of high explosive shell near the embrasure openings.

b. Principles of employment. (1) In general, the employment of field artillery in the attack of a fortified position does not differ from the employment of field artillery in the attack of an organized position. A successful attack requires a great preponderance of field artillery. Artillery preparations are longer and more intensive, ammunition expenditures consequently are much greater, and counterbattery is emphasized.

(2) Ground observation is certain to be limited and inadequate. Artillery must exploit fully all intelligence agencies, aviation, and sound and flash units to determine in detail hostile locations, particularly emplacements and hostile artillery. Vertical aerial photographs of the enemy positions provide the most effective means of accurately locating artillery targets.

(3) Support of the attacking echelons must be close and continuous. Prearranged fires are used extensively during the initial stages of the attack. Liaison, details of communication, and methods of shifting fires must be completely coordinated with the support unit. Rolling barrages may be employed to neutralize areas where hostile dispositions are not accurately located, to keep assaulting troops oriented, and to crater the ground for assaulting echelons. Barrages must be accompanied by other types of artillery fires to maintain neutralization of other hostile elements. Plans for action against enemy counterattacks are complete.

52. ENGINEERS. Early construction and maintenance of routes into and through the gap is a primary task for the engineers. Ordinarily, they breach the major obstacles. An engineer company or platoon usually is attached to each infantry battalion in the leading wave. This attachment may end when the infantry units have passed through the gap in the outer obstacles. The engineers then are available for improving breaches in the obstacles and for use, under division control, on the routes through the gaps; or they may remain attached, and be charged with assisting the infantry advance through additional wire and mine fields. Division engineers usually are heavily reinforced for the attack of a fortified position.

53. TANK DESTROYER UNITS. The tank destroyer gun, due to its high muzzle velocity, is among the best weapons for direct fire against fortifications. The self-propelled gun has the advantage of armor and mobility. The towed gun has the advantage of low silhouette and consequent rapidity with which it can be dug in and camouflaged. In deciding on the type of tank destroyer to be employed, serious consideration must be given to the probable location after initial objectives have been taken, and direct-fire cannon are displaced forward. If there is no defilade in the vicinity of the forward location, shell craters will be the only cover available. In such cases, it may be necessary to employ the lower silhouetted weapon.

54. CHEMICAL TROOPS. Chemical combat troops, attached to infantry units, and armed with the 4.2-inch chemical mortar, may be employed to fire smoke to cover movement into assault positions, to blind hostile observation, and to reduce the effectiveness of hostile fire. High explosive may be used to supplement artillery fires or to relieve artillery for other missions.

SECTION III

OPERATIONS

55. PRELIMINARY OPERATIONS. a. Reducing outpost position. (1) The outpost position may be of any type from hastily constructed field fortifications to a belt of permanent fortifications closely resembling the main position.

(2) Based on the results of reconnaissance and the task assigned, the commander determines what special troops, equipment, and combat power are needed to break through the outpost system; he organizes his command into its tactical groupings and assigns missions to each.

(3) Artillery of the heavier type constantly bombards the main position as soon as it is within range, paying particular attention to counterbattery fires.

(4) Operations against the outpost position must not unnecessarily disclose which part of the main position will be struck by the main attack of the whole force.

(5) Operations against the outpost system continue until the main position definitely halts the advance.

b. Artillery preparation. (1) A heavy artillery preparation is laid down, supplemented by bombardment aviation. This preparation drives defending troops underground, destroys many field fortifications and obstacles, dislodges camouflage, sets off antipersonnel mines, destroys enemy artillery, and provides craters to shelter the attackers. For greatest effect, a prolonged preparation is necessary. Deception may be gained if other parts of the front can be given similar fires.

(2) The amount of ammunition, artillery, and bombardment aviation available, the degree of surprise possible, and the depth of the fortifications on the front to be attacked, determine the duration and intensity of preparatory fires.

(3) At some time prior to the hour of attack, the bulk of all supporting fires, ground and air, is concentrated on the fortifications on the front of the initial penetration. The fire of flat-trajectory weapons is concentrated against certain fortifications selected in advance for destruction. Smoke is used to screen enemy observation.

56. THE BREAK-THROUGH. a. Preparations for penetrating the main fortifications, including issue of new aerial photographs and intelligence summaries, continue during preliminary operations. By the time they are completed, all equipment, weapons, assault units, and other troops are ready to move forward under cover of darkness, fog, or smoke.

b. Penetration of belts fortified in great depth usually will be by a series of limited objective attacks, other units being leapfrogged through the leading units, which reorganize, mop up, and move to protect the flanks.

c. In the initial break-through in a critical operation, the theater commander may make available a large unit of his tactical and strategical air force to neutralize the portion to be penetrated by concentrated area bombing with very heavy bombs.

d. Protected by supporting fires, engineers under division control move forward and open lanes through undestroyed wire, remove obstacles, blow mine fields, and prepare crossings over other principal obstacles. These engineers make gaps in major obstacles for the passage, first of personnel on foot, and as soon thereafter as possible, of vehicles attached to infantry assault battalions. Decontamination squads of chemical warfare troops attached to infantry assault battalions open lanes through any contaminated areas which cannot be avoided. The assault platoons advance as close as possible, and wait for the fire to lift. Preparatory fires are lifted, either on time schedule or on prearranged signal, to tar-

gets in rear and to the flanks of the sector to be assaulted. Direct fire on embrasures continues.

e. When supporting fire is lifted, the assault echelon of the battalion attacks according to prearranged plan. The advance must be made aggressively but with every precaution being taken for individual cover.

f. Breaking the continuity of the enemy's front breaks the coordination of his mutually supporting fires, but his extensive signal communication system permits him to reestablish it rapidly. Hence, a breach must be exploited immediately.

g. As the breach of the enemy lines is deepened, additional assault elements from battalion and later from regimental reserves are sent into the gap to attack the flanking works in each direction and widen the base of the penetration. Meanwhile, the leading battalion deepens the penetration by advancing and attacking the next fortifications in its zone. Troops in rear are pushed rapidly through the gap created.

h. Operations continue until the entire front selected for a major break-through is reduced. As the attack progresses, the flanks of the penetration are defended to throw back counterattacks and to protect passage through the gap of troops assigned exploitation and rear attack missions.

i. If the fortified position consists of two or more defensive belts of works established several thousand yards apart, a regrouping of the elements of the division and a displacement of artillery is necessary before the second belt can be attacked. It is usually also necessary for engineers to clear extensive mine fields, breach obstacles, and bridge ditches and craters for the movement forward of the essential combat vehicles.

57. EXTENDING THE GAP. a. Since troops in fortifications prepared for all around defense cannot readily be maneuvered out of position, widening the gap by action

against the flanks and rear of remaining works is difficult. Supporting direct fire for such action may interfere with continuance of the frontal attack. If the initial penetration is on a narrow front it may be difficult to bring direct-fire weapons through the gap to support the flanking attacks and to fire on works on reverse slopes.

b. Where practicable, the initial penetration should be on a front wide enough—perhaps 3,000 yards, depending on the terrain—to permit passage of small units without interference from aimed small-arms and automatic-weapons fire. The next objective is to obtain a gap free from major hostile artillery action, and large enough to permit passage and supply of large exploitation units, such as an armored division.

c. In densely fortified localities, obtaining such a gap may involve the reduction of so many forts as to require a prohibitive amount of time and effort. Two penetrations may be made, a suitable distance apart, and troops pushed through the gaps. These troops join to isolate the required portion of the belt and to destroy or dislodge the supporting artillery. The isolated portion thus is no longer a threat as a source of major counterattack and, being deprived of supplies and artillery support, may be contained by relatively small forces and destroyed concurrently with other exploiting operations.

58. MOPPING UP. **a.** Mopping up isolated works is not difficult after they have been breached by fire or by explosives. Mopping up elaborate underground installations is a more serious problem. Troops specially designated, trained, and equipped for this purpose may be used. Flashlights should be included in their equipment. Use of smoky flares should be avoided. A large proportion of the party should be armed with carbines and sub-machine guns. Chief reliance for the destruction of underground works and of their defending personnel is on electrically detonated charges which can be placed,

covered with fire until the attacking units have withdrawn, and fired without delay. Shaped charges have the advantage of projecting a large part of their blast effect through a partition.

b. Explosives employed underground may produce deadly fumes, against which the service gas mask is not sure protection.

c. Once a footing has been gained in the underground works, the attacker must press his advantage to insure early destruction of all connected turrets and bunkers, thus expediting the work of the assault units operating above ground.

59. COMPLETING THE ACTION. a. After a penetration has been effected the attacker may either be confronted with another fortified belt, which may limit exploitation, or he may break into relatively open country suitable for mobile warfare.

b. The composition of exploitation forces must take these conditions into account. The former favors the employment of infantry units able to seize and to maintain their position on comparatively limited objectives; the latter favors the use of armored units, motorized infantry, and other highly mobile troops. As soon as the width of the gap and the degree of security permit, units charged with the reduction of the second belt, where it exists, are rushed through the gap, and operations to accomplish the final break-through are continued.

60. DETAILED ACTION OF INFANTRY UNITS. a. **Assault Platoon.** (1) The assault platoon which has organized one assault squad will normally be assigned a single fortified emplacement, or bunker, as an initial objective, with at least one direct-fire cannon in direct support. The formation of the platoon may be as shown in figure 18.

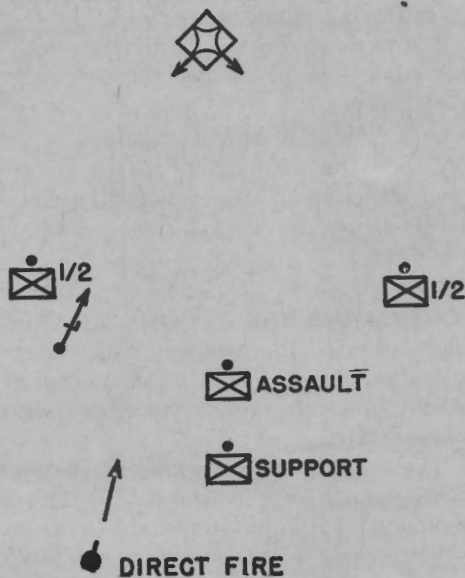


Figure 18. Formation of assault platoon—schematic

(2) The flank groups cover the advance of the assault squad, directing their fire at any open emplacements which may be on either flank of the bunker.

(3) Direct-fire cannon and light machine guns fire at embrasures to keep them closed.

(4) The wire-cutting party cuts a path through wire using bangalore torpedoes and wire cutters and covers the advance of the demolition party to the bunker. If practicable, the advance is made in dead space not covered by fire from the embrasures. Fire of the direct-fire cannon ceases on signal, and of the light machine gun, when masked. Fire of antitank rockets and flame

thrower, directed against embrasures, may assist in covering the advance of the demolition party at close range. Upon breaching the embrasure, the assault squad rushes the emplacement and with hand grenades and flame thrower overcomes all enemy resistance. Flank groups move up and cover the reorganization of the platoon.

(5) The support squad protects the flanks of the platoon and is prepared to place immediate fire on local counter-attacks. It may assist in mopping up. Upon capture of the bunker, the platoon reorganizes and is reequipped according to plan by carrying parties from the battalion ammunition and pioneer platoon, company support, or battalion reserve.

b. Assault company. (1) The assault company will usually hold one platoon in support initially. Upon capture of the initial objectives by assault platoons, the support platoon leapfrogs to its objective as rapidly as direct-fire cannon can be brought to bear on new targets. A light machine gun from an assault platoon joins the support platoon in its attack.

(2) 60-mm mortars may be held under company control. Mortars are prepared to protect the flanks of the company and bring immediate fire on local counterattacks. They are also employed against defenders who have taken cover in shell holes and fox holes.

(3) Upon reorganization and rearming of assault platoons, attack on the next objective is initiated. A support should be reconstituted.

(4) It is the function of the company commander to coordinate the advance of the platoons, provide for switching fire of direct-fire cannon, and assure their forward displacements as required.

(5) The advance of the company is coordinated with the plan of artillery support. Artillery fire is maintained on successive platoon objectives, lifting to succeeding

objectives as the assault thereof is initiated. An artillery forward observer is with the assault platoon.

c. Assault Battalion. (1) Through the fires of the heavy-weapons company and location of reserves, the battalion provides for flank security and is prepared to meet local counterattacks.

(2) Heavy machine guns are located, when terrain permits, to deliver overhead fire against embrasures and to cover the flanks of the battalion. 81-mm mortars are emplaced to mass their fires to the front or flanks of the battalion. The battalion antitank platoon will usually be placed in direct support of assault units. Attached infantry cannon will usually be held under battalion control for fire against emplaced weapons holding up the advance of assault units.

(3) If the reserve is committed through an assault company, the battalion commander provides direct-fire cannon support. Elements of the reserve may be used to overcome small isolated resistances which have been passed over. Special attention is given to underground works which have not been destroyed completely and may still be occupied.

(4) The battalion commander assures the prompt re-equipping of assault platoons, the forward displacement of direct-fire cannon, and the ammunition supply for these weapons. For this he uses the ammunition and pioneer platoon, attached engineers, and elements of the reserve, as necessary.

SECTION IV

COORDINATION OF ATTACK ELEMENTS

61. GENERAL. Every means is taken to insure ready identification to the air of the location of leading elements to insure coordination of air and ground effort.

Air parties may be sent to the lower assault echelons for this purpose.

62. SIGNAL COMMUNICATION. a. Signal communication in higher echelons is characterized by carefully prepared and complete wire and radio nets, and by extensive use of messengers. The prepared fields of fire of the defense minimize the use of runners in lower units, and reliance must be placed on electrical communication, especially the portable radio and the soundpowered telephone. Visual communication is employed extensively. The close intervals at which assault units, supporting units, and direct-fire guns operate make practicable the use of hand signals, pyrotechnics, and smoke grenades.

b. Once fire has been lifted from an emplacement, it may be necessary to restore it because of failure of the assault. Such emergency requires prearrangement of signals. Provision must also be made for the discovery of works or embrasures not known to exist prior to the attack.

SECTION V

SUMMARY

63. SUMMARY. Success in the attack of a fortified position depends upon—

- a. Air and artillery superiority.
- b. Thorough and complete intelligence.
- c. Heavy preliminary bombardment.
- d. Direct fire of high velocity cannon.
- e. Clearance of obstacles.
- f. Highly trained infantry with special equipment.
- g. Extensive signal communication.
- h. Antiaircraft protection of gaps.
- i. Exploitation of break-through by mobile forces.

PART TWO

COMBAT IN TOWNS

CHAPTER 1

CHARACTERISTICS

SECTION I

GENERAL

64. REFERENCES. For the general characteristics of combat in towns and the principles governing offensive and defensive combat, see FM 100-5. For methods of offensive and defensive combat by infantry units, see FM 7-10, 7-15, 7-20, and 7-40.

65. PURPOSE. The purpose of Part Two is to state the application of the fundamental doctrine and tactical principles of offensive and defensive combat in operations involving the attack and defense of cities, towns and villages.

66. SCOPE. This manual covers the methods of employment of individuals and units up to and including the infantry regiment and its supporting arms in the attack and defense of built-up areas.

SECTION II

TACTICAL CONSIDERATIONS

67. GENERAL. **a.** Built-up areas offer concealment for troops and weapons and protection from the fire of weapons and from mechanized attack. However, they are conspicuous topographical features of which exact details are either available or readily obtainable.

b. Since the characteristics of city, town, and village fighting favor the defense, the attacker will seek to isolate and bypass a town which has been developed into a strongly defended position rather than make a direct attack. Conversely, the defender will seek to select for defense towns the strategic locations of which make a direct attack essential to the success of the hostile operations.

c. The nature of combat within a built-up area is influenced by the following factors:

- (1) Concealment and cover are available to both sides.
- (2) Streets and alleys invite movement but constitute lanes readily swept by fire.
- (3) Observation and fields of fire are limited.
- (4) Operation of mechanized vehicles is ordinarily greatly restricted and canalized, subjecting them to close range attack by various weapons. Tanks are at a further disadvantage because of inability to elevate or depress their main weapons to fire into the upper floors or basements of nearby buildings.
- (5) Close proximity of opposing forces will ordinarily limit the effectiveness of close support by artillery and zone-of-contact missions by combat aviation.
- (6) Communication will be impeded, thus making the decentralization of control to small units imperative. This necessarily entails a high degree of initiative and a thorough understanding of the situation by junior leaders.

SECTION III

SPECIAL CONSIDERATIONS

68. OBJECTIVES. In an attack of a village, the objective of the attacker is the village itself. In the case of larger towns or cities, the final objective will probably not be houses or streets, but such strategic points as the railroad station, telephone exchange, gas and other public utility works. These points will undoubtedly be included within strongly defended areas.

69. BUILT-UP AREAS. a. Description. Built-up areas are usually made up, apart from factories and parks, of three distinct building arrangements: on the outskirts, isolated houses or groups of houses surrounded by gardens, trees, fields, and vacant lots; farther in, closely spaced detached and semidetached houses; and, in the center, blocks of buildings of different size and height. In the area of isolated houses, buildings are comparable to inferior pill boxes and should be treated as such in attack or defense. Detached and semidetached houses closely spaced are the intermediate stage and are usually flanked by streets on one side and small gardens or back areas on the other. The center of a town almost invariably consists of buildings built on the block system, so that except for open squares, there is little or no space between them other than that essential for streets and alleys; but it is important to note that nearly all such buildings have cellars and basements, which assist greatly in the defense.

b. Changes in features. When a built-up area is the scene of a prolonged period of fighting, many of its characteristics will be modified. Buildings are likely to become heaps of rubble and observation is increased. When a whole sector of a town is reduced to rubble, the

piles of debris render the area analogous to close country providing much cover; they will also restrict movement, except on foot. This possible change in the features of a built-up area must be borne in mind as influencing the methods of combat as the attack progresses.

70. SPECIAL CONDITIONS. a. Effect. Built-up areas possess a third dimension not usually present in combat. It is possible to bypass an enemy by going directly over or under him. The possession of a position above that of the enemy gives a better fighting advantage. The defender may be expected to take special steps to guard approaches to his level from above, employing his fire to rake the streets and lower floors. At times the attacker may obtain better fire effect and make better progress by action in and through lower stories and basements.

b. Locating hostile fire. Buildings obscure the view, and visibility is further restricted by dust caused by the impact of projectiles and by explosive charges. The effect of noise, greatly increased on account of the inclosed nature of such areas, can be exploited to an extent out of all proportion to the effort required for its production. The point of origin of fire is difficult to locate on account of the noise of discharge being drowned by the crack of a bullet as it passes, or by the noise of impact of a projectile, and because of the many points from which fire can be delivered in a relatively small area. False information may arise concerning the location of enemy snipers. What may sound like enemy firing from adjacent rooms or buildings may mean in reality that the latter are being subjected to fire from elsewhere.

c. Maneuver. Because most of the available cover is rigid and set in straight lines, movement is usually seen and maneuver greatly restricted. Varying conditions as to the density of buildings and the bareness of streets

will necessitate a judicious variation in methods of combat; at one time, stealth and cunning will promise success while again, speed and aggressiveness of action will be required.

d. Control. In no other form of warfare except in dense jungle is observation so restricted. This condition makes centralized control difficult. Commanders will be able to get close to their units in contact but will be able to observe only fractions of them at one time. These conditions will mean that most of the fighting will resolve itself into small independent actions and will place a premium upon initiative and aggressiveness of the small unit leader.

e. Signal communication. (1) Signal communication during combat in built-up areas differs from that in open areas. It is adversely affected by restriction in visibility, limitation on physically traversable routes, and the effect of buildings, particularly those with steel frames, on the use of radio. It is aided by the prevalence of shortened distances between headquarters and in some built-up areas may benefit from the existence of covered routes, such as subways, basements, and traversable sewers.

(2) Messengers furnish a principal means of communication in built-up areas. Their employment may be capitalized by careful prior instruction in the use of suitable routes, and improving these instructions by careful reconnaissance designed to make maximum use of covered routes, such as subways, sewers, basements, and routes through intervening buildings. The reduction of distances between command posts, common in such fighting, serves to increase the effectiveness of messenger service, if intelligently planned.

(3) Radio may be reduced in efficiency in built-up areas due to the inevitable effects of buildings intervening between stations. This effect becomes most marked if

buildings contain steel frames or metal roofs. Care must be taken to erect stations at the greatest possible distance from such metallic deposits if efficient operation is to be assured.

(4) Wire communication will commonly be more slowly installed in built-up areas than in open country due to the necessity of picking suitable covered routes, as discussed in (2) above. It may often be practicable to employ portions of existing commercial circuits for the installation of wire systems, although such employment requires prior planning and careful check of existing facilities and should not be presumed to make the construction of a wire system rapid.

(5) Due to limited visibility imposed by intervening structures, the use of visual signaling is limited. Pyrotechnic signals will frequently be masked by buildings and may be concealed or confused with smoke and fires during combat.

f. Neutralization of fires. Neutralization of hostile fires is of paramount importance. Due to the proximity of forces in fighting within built-up areas, much of the close-fire support will be furnished by infantry cannon using direct fire, and by elements of the antitank company. The bulk of the mortars and machine guns must be well forward. Covering fire is essential for every operation, and must be provided within the smallest unit in addition to that furnished by larger units.

71. NIGHT OPERATIONS. Due to the restriction of movement outside buildings by day, much fighting in towns will take place at night. Streets can be crossed, and small parties can infiltrate between defended areas or defended houses. They can place explosive charges, learn the location of supports and reserves, eliminate hostile patrols, and occupy or burn undefended houses. Small local night attacks may be employed to gain roof

tops and to infiltrate through enemy lines to be in position to support a daylight attack. The psychological effect of noise and fire at night must not be overlooked.

72. USE OF SMOKE. The use of smoke to provide concealment, to blind hostile observation, and to implement deception and surprise, is increasingly important especially as it applies to smaller units. A built-up area will retain the smoke for a longer period of time than an open area.

73. USE OF INCENDIARIES. Incendiaries will often be a potent factor in town fighting. Frequently the quickest, surest, and most economical way of dislodging an enemy from a building will be to burn it. In defense, precautions against flames should be given high priority. The use of incendiaries must be carefully controlled since flame is a double-edged weapon which may affect either side.

74. MISCELLANEOUS. a. Looting. Built-up areas offer many opportunities for looting. The acquisition of loot is likely to lead to the discarding of equipment, with a resultant loss of efficiency. However well disciplined a unit may be, unless precautions are taken in advance, looting will begin on a small scale and tend to increase. It deteriorates the soldier, detracts from alertness, slows initiative, and may seriously interfere with the progress of the attack. All leaders must see that instructions against looting are obeyed, and that violations are promptly and properly punished.

b. Civilian control. The problems of controlling and administering the civilian inhabitants will nearly always arise, and may be complicated by a flow of refugees into built-up areas. The degree of assistance and cooperation that may be expected from the civilian inhabitants will

vary greatly. At one extreme is the full cooperation of inhabitants in friendly territory. In some enemy-occupied countries there will be both friendly and unfriendly elements. Within an enemy country itself, the population will inevitably be hostile and little in the way of cooperation may be expected, but maximum assistance should be obtained from any elements that are friendly. Spies and fifth columnists must be ceaselessly sought out and mercilessly dealt with. Arrangements are made for sudden unforeseen movement either into an area or out of it. Bombing tends to drive the inhabitants out of a town, while the ground action that follows on the outskirts will drive them in again.

c. Prisoners. The handling of prisoners of war is normal but should be prompt. Leading units must not permit an accumulation of prisoners to interfere with their progress.

CHAPTER 2

THE OFFENSIVE

SECTION I

PLANS AND SUPPLY

75. PLANS. a. Intelligence. Plans are based upon the best intelligence available. Suggested sources of information are—

(1) Standard travel publications such as guide books, road maps, city maps, industrial reports, newspapers, and magazines.

(2) Special summaries obtained through normal intelligence channels.

(3) Information from local inhabitants regarding hostile activities and dispositions and recent changes that have occurred in structures within the area of interest.

(4) Aerial reconnaissance, aerial photographs, and maps.

(5) Aggressive and detailed reconnaissance, including especially organized raiding parties employed to secure specific information or to capture prisoners.

(6) Prisoners.

b. Alternate plans. Before making a direct attack upon a strongly defended built-up area, consideration is given to the following alternate plans:

(1) Bypassing, isolating, or encircling it.

(2) Making it untenable by incendiary action. This is possible only for areas, or parts of areas, which contain buildings of inflammable construction.

c. Phases. When the attack of a defended built-up area has been decided upon, plans must cover two distinct phases as follows:

(1) PHASE I. The capture of an initial position within the built-up area, the possession of which will eliminate hostile fields of fire, reduce the effectiveness of hostile long-range flat-trajectory fires, and limit enemy observation outside the area.

(2) PHASE II. The advance through the built-up area. Plans for this phase must provide for the following:

(a) Decentralization of infantry control to subordinate units.

(b) Regaining of control at stated times or on designated positions. Control will be facilitated by frequent reports from subordinate units, either periodically or upon reaching predetermined objectives.

(c) An organized mopping up of hostile resistance. In strongly defended areas it may be necessary for the leading elements to mop up as they advance. In lightly defended areas, it may be possible for leading elements to push forward rapidly, leaving the mopping up activities to supports and reserves.

(d) Steps to insure the maintenance of communication between the artillery and supported units, between adjacent units, and from front to rear.

d. Supporting positions. When a city, town, or village is entirely within the zone of action of an infantry regiment, battalion, or rifle company, the attack of a portion of the command should be directed to secure positions outside the built-up area from which it can assist by fire in the step-by-step capture of the area, command the line of communication and retreat of the defenders, and prevent their reinforcement.

76. SUPPLY. a. Requirements. The supply of troops in the initial phases of the attack will be similar to that employed in an attack against an organized position. The type of construction of the built-up area and the extent of its defense will have a bearing upon the kind and amount of supplies required. After entry has been made into the built-up area, replenishment and distribution will become increasingly difficult. Vehicular traffic may be interrupted or restricted by demolitions and fire. Every effort must be made to push supplies as far forward as cover and concealment will permit. This will necessitate greater reliance on the employment of hand-carrying parties.

b. Mortars, grenades, and explosives. Supply arrangements will ordinarily include provision of large stores of heavy ammunition and smoke shell for mortars, since the nature of combat in built-up areas is such as to call upon these weapons for their maximum destructive effect and for screening missions rather than for extreme range. Large quantities of grenades will be required for house-to-house fighting and explosives for demolitions.

SECTION II

INFANTRY REGIMENT AND ITS SUPPORTING ARMS

77. PLANS FOR PHASE I (see par. 75c(1)). Plans for the execution of phase I of the attack will usually be in accordance with the methods outlined in FM 7-40 for the attack of an organized position. The initial dispositions of artillery units in direct support are chosen, as far as practicable, in extension of the streets within the zone of action of the supported unit so that the maximum effect of enfilade fire may be obtained during the support of the second phase.

78. PLANS FOR PHASE II (see par. 75c(2)). Plans for phase II of the attack must take into consideration the factors listed in paragraph 67c. They will usually be characterized by the following:

a. Training and rehearsal, where time and available information make such preparatory activities practicable.

b. The assignment of relatively narrow frontages to leading battalion(s). These will ordinarily vary in width from one to four city blocks. (See fig. 19.) Among the factors determining frontages to be assigned are the strength of the defensive organization and the size, type of construction, and density of buildings within the zone of advance.

c. Maintenance of direction and determination of the location of units is usually facilitated by the geometric lay-out of the occupied area.

d. If the operation entails a considerable advance, the regiment will usually be disposed initially in column of battalions.

e. A large portion of supporting weapons will ordinarily be attached to battalions. The determining factor in the decision will be whether control and close support can best be obtained by such attachment. Steps must be taken to insure that the attached weapons are provided with close-in infantry protection.

f. Reserves will ordinarily have little opportunity to maneuver within the regimental zone of action. Their primary missions will be to repel counterattacks and to mop up hostile resistance which has been bypassed by forward elements. They may also be used to maneuver through the zone of an adjacent unit which has advanced more rapidly, for the purpose of striking in flank resistance which is holding up the attack of the regiment. A portion of the heavy weapons of reserve battalion(s) initially may be assigned close support missions with the forward units. The heavy machine guns of the reserve may be assigned antiaircraft missions; when assigned

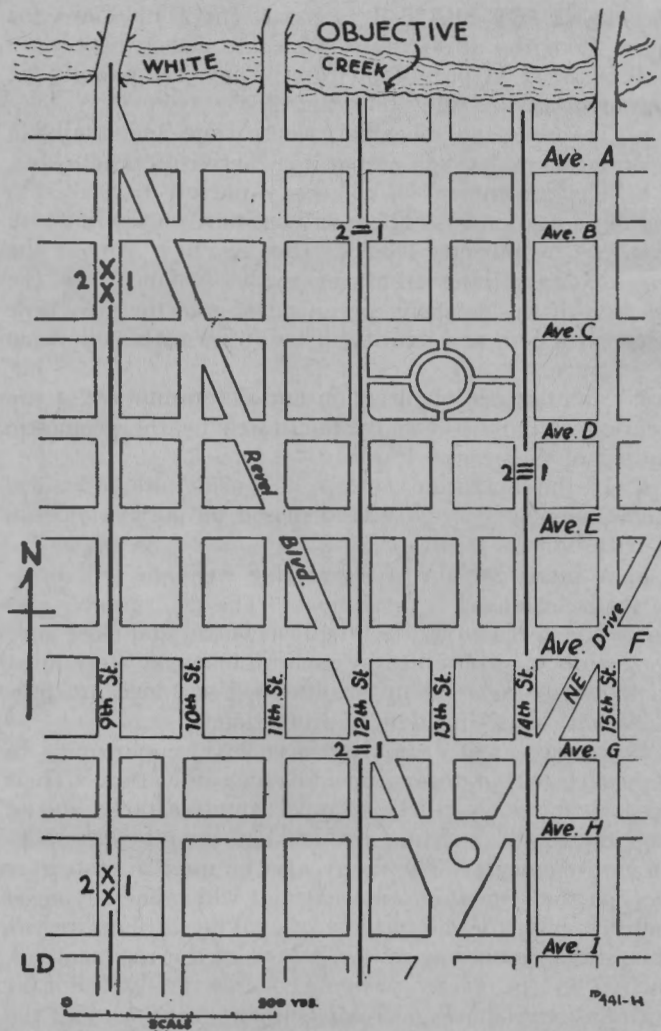


Figure 19. Infantry regimental and battalion zones of action for attack through a built-up area—schematic diagram.

such missions, they must revert to control of their own battalions when those units are committed to action.

g. During the advance through the built-up area, attached engineers may be used for any or all of the following purposes:

(1) To clear areas of antitank and antipersonnel mines and booby traps.

(2) To clear lines of communication, including the removal of street barriers and the temporary repair of streets.

(3) To execute demolitions.

h. Certain conditions will require the use of special equipment or personnel or both. Rifle squads may be especially equipped and employed as assault squads for reducing strong fortifications. The size, composition, and equipment varies with the nature of the task. (See chs. 5, 6, and 7, pt. one.)

i. Available tanks are kept in reserve for the performance of suitable missions, including meeting hostile counterattacks. Individual tanks and tank destroyers may be used as accompanying guns to attack by fire strongly fortified buildings and to assist in reducing barricades. Tanks so used must have close infantry support. The use of long-range flame throwers installed in tanks will be effective in neutralizing enemy resistance and possibly in driving the enemy from cover.

j. Supporting artillery will rely to a large extent upon forward observers for the adjustment and observation of fire. At times, leading infantry elements that are without cover may have to withdraw a short distance so that they will not be endangered by concentrations fired in close support. The characteristics of the light howitzer afford great flexibility of the trajectory to include high-angle fire.

k. Chemical combat troops may be attached to an infantry regiment to fire HE concentrations and smoke missions to blind observation, cover an advance, and pro-

duce deception. These units should be employed well forward.

l. The infantry regimental commander must take special steps to maintain communication with subordinate adjacent units. Although the commander will usually be close in rear of the attacking units, he must rely to a considerable extent on liaison officers to keep him informed and maintain lateral communication. These liaison officers will be fairly close to their own units as far as actual distance goes, but may have difficulty in communicating due to dead spaces in radio and severed wire lines. They must therefore be accompanied by a sufficient number of messengers to transmit their reports and information.

m. Limitations on the extent of demolitions allowed attackers will frequently be prescribed by higher headquarters. This information, together with any additional instructions which the infantry regimental commander wishes to add, must be transmitted by him to the lowest units.

SECTION III

INFANTRY BATTALION

79. PLAN OF ATTACK. a. Formation. (1) The formation to be adopted and zones of advance of companies in the attack are determined by—

- (a) Strength of enemy resistance expected.
- (b) Width of the battalion zone.
- (c) Density and size of buildings within the zone.
- (d) Depth of advance required.

(2) When the width of the battalion zone exceeds two blocks, two rifle companies are usually assigned to the attacking echelon. (See fig. 19.) Normally a rifle company is not assigned more than two blocks.

(3) When the built-up area consists of blocks of buildings, such as the business sections of cities or towns, where the buildings must be attacked block-by-block, streets are usually designated as boundaries. The buildings are the immediate objectives and their capture must be made the responsibility of a single commander. (See fig. 20.)

(4) In built-up areas, where the density of buildings does not require a block-by-block attack, it may be desirable to designate boundaries within the blocks in order that houses on both sides of streets will be included in the zone of one attacking unit. (See fig. 21.)

b. Objectives. Successive objectives are assigned attacking rifle companies, with plans made to continue the attack from each. Suitable objectives are streets, rivers, and railroads crossing the line of advance. Reports are required from companies as each objective is reached, and reports are made to regiment when the battalion objective is reached.

80. EMPLOYMENT OF SUPPORTING UNITS. a. Antitank and cannon weapons. Available antitank weapons are emplaced to cover streets from which mechanized counterattack appears probable. Some or all of the battalion antitank guns may be attached to leading rifle companies for direct-fire missions against fortified positions or buildings in addition to antitank missions. One or more platoons of the antitank company may be attached to battalions. One or more cannon platoons likewise may be attached.

b. Ammunition and pioneer platoon. The battalion ammunition and pioneer platoon assists in getting ammunition forward, in clearing areas of mines and booby traps, and may furnish men specially trained in demolitions to be attached to attacking rifle companies.

c. Heavy weapons company. Usually a large part of the weapons of the heavy weapons company are attached to attacking rifle companies. Normally the battalion

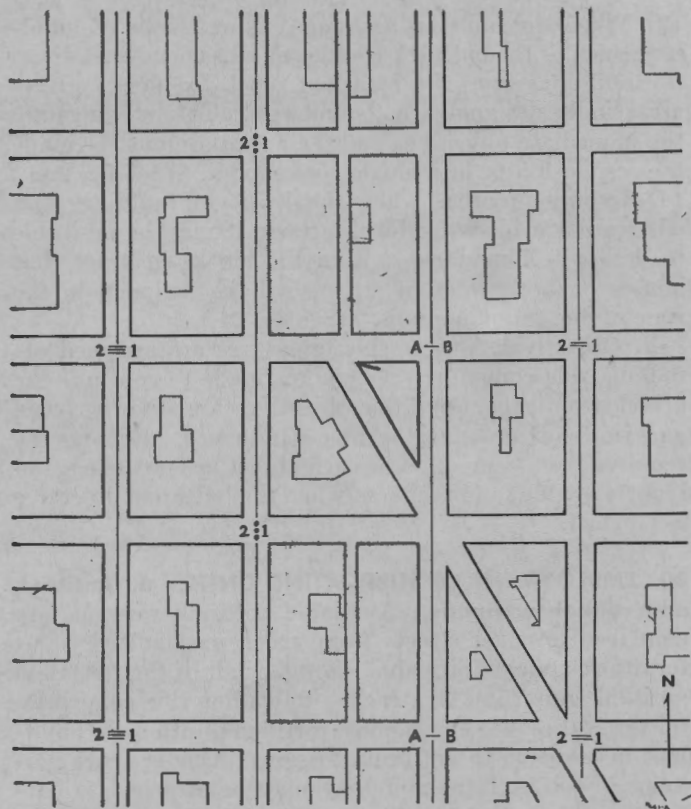


Figure 20. Boundaries for a battalion attacking in a built-up area, where a block-by-block attack is required—schematic diagram.

commander retains one platoon of heavy machine guns and one section of 81-mm mortars for use with the reserve. These machine guns are usually emplaced initially on roofs for antiaircraft and long-range fire missions. The mortars may be employed initially for long-range fire missions.

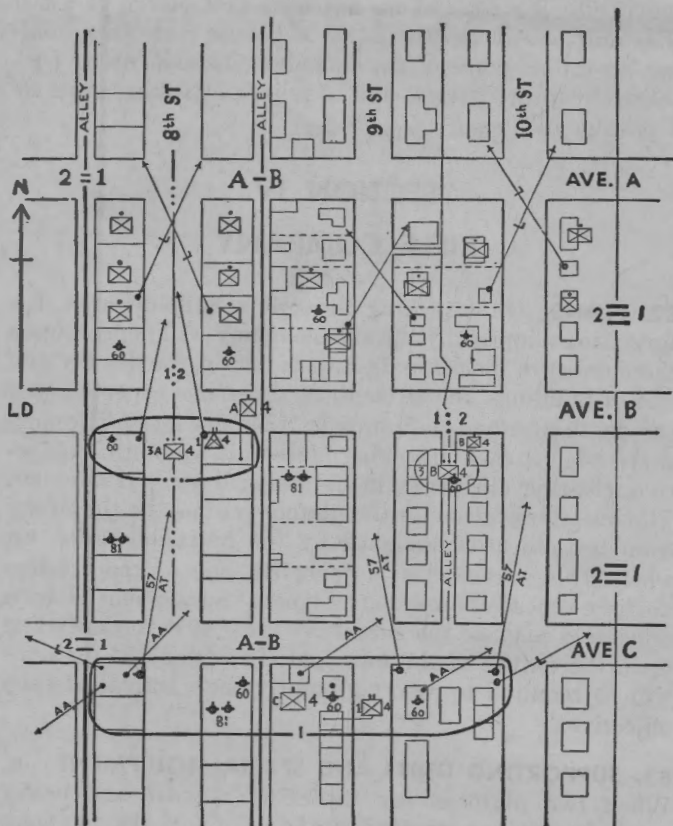


Figure 21. Disposition of attacking platoons, supports, and reserves of a battalion attacking in a built-up area, where a block-by-block attack is not required in a portion of the area—schematic diagram.

81. BATTALION RESERVE. The battalion reserve is kept well forward, usually being from one to three blocks in rear of the assaulting companies. Its normal missions will be to protect the flanks, to repel counterattacks, to

move into the zone of an adjacent unit either to assist that unit or envelop the flank of hostile resistance holding up the advance of the battalion, to mop up or consolidate captured areas, and to relieve attacking units by a passage of lines.

SECTION IV

RIFLE COMPANY

82. PLANS. In attacking through a built-up area, the formation adopted by the rifle company will depend upon the number of blocks in its zone of action, the density and size of buildings, the strength of resistance expected, and the depth of advance required. (See fig. 20.) The mission assigned each attacking platoon is to gain its objective, clearing all houses in its assigned zone of advance. The initial objective for the platoon(s) may be the initial company objective assigned by the battalion order, or, when strong resistance is expected, one or more intermediate objectives may be assigned. Subsequent platoon objectives may be the successive cross streets, depending upon the nature of the anticipated resistance. Platoons will be required to report promptly their arrival at each objective.

83. SUPPORTING UNITS AND SPECIAL EQUIPMENT. a. When two platoons are attacking abreast and heavy machine guns are attached to the company, the company commander will normally attach them to one of the attacking platoons, and the light machine-gun section to the other platoon. When no heavy machine guns are attached to the company, one light machine-gun squad may be attached to each of the attacking platoons. Machine guns not attached to platoons are usually retained under company control to support the attack and be prepared for attachment to the support when it is committed. The

60-mm mortars are usually attached to platoons. Other weapons attached to the company are usually retained initially under company control.

b. The support platoon is held close behind attacking platoons to mop up bypassed enemy elements, or to pass through a depleted or disorganized platoon.

c. When the company has been reinforced with special equipment such as explosives and flame throwers, such equipment is allotted to the assault platoons.

SECTION V

RIFLE PLATOON

84. PLAN OF ATTACK. a. **Objective.** A rifle platoon in the attack of a strongly defended built-up area is ordinarily assigned not more than one block. (See fig. 20.) It may be assigned a cross street, exclusive, as its initial objective and directed to be prepared to continue the attack on order. It immediately reports its arrival on the objective.

b. **Formations.** Suitable formations for a platoon attacking through a built-up area are shown in figures 21 and 30.

85. CONDUCT OF ATTACK. a. **The advance.** The block-by-block attack of a rifle platoon requires alert, aggressive leadership on the part of the platoon leader. After the attack has been launched (see par. 81 and fig. 30), he maintains close contact with his leading squads and promptly supplies covering fire and support as needed. When he observes that smoke or additional supporting fire will facilitate the advance, particularly across parks and open areas, he calls for it promptly. When the platoon must attack on both sides of a street, the platoon leader uses his platoon sergeant or platoon guide to conduct the advance on the side where least

resistance is expected, while he takes the other side. When an attacking squad is held up, the support squad is used promptly to maintain the impetus of the attack. When an objective is captured, the platoon leader notifies the company commander, promptly reorganizes his platoon if necessary, and prepares to resume the attack.

b. Supporting arms. If machine guns are attached to the platoon, they may be used initially to cover the entry of attacking squads into the first buildings of the block being cleared and to cover the streets and alleys. Thereafter, they are displaced by the platoon leader as the situation dictates. Attached 60-mm mortars are weapons of opportunity, and they and their observers must be well forward near leading attacking squads. Their shells will have little effect against solidly constructed buildings or troops with overhead cover. They will have their principal use against enemy snipers on roofs and troops behind barricades or other shelters without overhead cover. The 81-mm mortar, using the heavy shell, will wreck lightly constructed buildings and penetrate most roofs. Smoke shell, when required, is used to cover the advance, particularly across open spaces. WP shells may be employed for their incendiary effect.

c. Reinforcements. (1) The platoon will frequently be equipped with explosives, rocket launchers, and flame throwers. These are used to equip assault squads. (2) Strong buildings and emplacements stubbornly defended may be reduced or neutralized by direct-fire assault guns (either organic infantry cannon or attached artillery pieces), or armored vehicles brought forward under company or battalion control. The platoon must protect these weapons by fire, and assault the objective the instant the fire lifts. Close coordination is required.

d. Barricades. It may be necessary to overcome enemy resistance at a barricade that cannot be out-flanked. Here the 60-mm mortars may be effective. When a frontal attack becomes necessary, the enemy

should be blinded with smoke. It may be well to wait for the second or third cloud before assaulting the barricade. If constructed of inflammable material, the barricade should be reduced by incendiary action.

SECTION VI

RIFLE SQUAD AND INDIVIDUAL

86. TRAINING. Combat in built-up areas requires thorough individual and small-unit training and the exercise of the highest degree of initiative, skill, cunning, and courage on the part of the small-unit leaders and individual soldiers. No two situations are alike.

87. METHODS OF ADVANCE. The advance will be from house-to-house through side yards; over rooftops; by breaching walls; or through back yards, streets, or alleys. The zone of advance of an attacking squad normally includes one side of the street only. Leading troops avoid streets as much as possible, as they are usually well covered by enemy fire. When required to advance along a street, the advance is made in two or more parties, each covering the opposite side of the street. If possible, the advance should be covered by a machine gun advantageously located. The squad is given a mission of clearing a particular house with instructions that as soon as the house is cleared, it will cover the advance of an adjacent squad, or proceed to the next house, or both. All movements across open spaces must be covered by fire and made at a run; the movement should be screened by smoke or other means, if practicable.

88. EQUIPMENT. a. **Individual.** Troops engaged in house-to-house fighting should be lightly equipped. Steel helmets, rifles, bayonets, and hand grenades are essential items. Special equipment, such as rubber- or rope-soled

shoes, submachine guns, pistols, knives, toggle ropes, and grappling hooks are frequently useful. An extra pair of socks pulled over the shoes, or burlap strips wrapped around the shoes, may be used in lieu of rubber-soled shoes. Each squad or detachment should have heavy tools, such as crowbars and axes, for use in breaking through doors, walls, and roofs.

b. Special. A rifle squad will frequently have available men equipped with explosives, rocket launchers, and flame throwers. Squad leaders are trained how to use these weapons effectively in the house-to-house advance.

89. CONDUCT OF ATTACK. The following principles, methods, and procedures should guide squad leaders and individuals in the advance and attack:

a. Since house-to-house fighting is difficult to plan in advance and depends upon the teamwork of individuals and small units, details of execution are decentralized to subordinate leaders. The immediate mission and plan of each group must be clear and unmistakable, and thoroughly understood by each individual.

b. Subdivision of the squad into two or more groupings comprising covering and searching parties, is frequently necessary.

(1) The covering party must protect and facilitate the advance of the searching party toward the building under attack by covering by fire the movement of the searching party.

(2) It is the duty of the searching party to enter and search all buildings which may be held by the enemy. The searching party must be kept small because too many men get in each other's way when fighting in close quarters. One or two of the searching party, properly equipped and adequately covered by fire, precede the party and force entry into the building. The remainder of the searching party follow promptly. Once inside the building, one or more men are posted to prevent surprise.

The remainder of the group go about the task of clearing the building in accordance with a prearranged plan. As a general rule, the minimum number of men are assigned to each task.

c. The city, town, or village must be systematically attacked, section by section. Adherence to this principle will reduce the possibility of leaving hostile centers of resistance in the rear.

d. The line of advance chosen must be one which does not mask the covering fire. It should also be remembered that it is suicidal to delay in the open.

e. Streets, alleys, vacant lots, and open areas afford the best fields of fire for the defender and therefore constitute areas to be avoided or crossed with caution.

f. Cover must be selected in advance. It is too late to select cover when being fired upon. Hug walls and move rapidly from cover to cover. Quickly roll over roof tops and walls. Do not go over them upright. (See fig. 22.) The individual must be trained to fire around the right-hand side of cover from the right shoulder and around the left-hand side from the left shoulder, as he exposes less of the body in that way. (See fig. 23.) He avoids, if possible, firing over the top of cover unless the firer's silhouette will blend with his background.

g. In combat, more unnecessary casualties result from bunching than from any other cause. This is especially true in house-to-house fighting. (See fig. 24.)

h. Control will be difficult when the fighting occurs among buildings. Movement in close proximity to the enemy must be planned in advance, executed rapidly, and always covered by fire. It is extremely important that there be *preliminary* planning for maintaining coordination during the attack.

i. There must be close coordination with supporting weapons. Automatic supporting weapons will be placing heavy fire down streets and open areas. If rifle units

must cross these streets or open areas in their advance, these fires must be lifted according to previously planned signals.

j. House-to-house fighting lends itself to surprise situations. The object is not only to avoid being surprised but to surprise and annihilate the enemy. Every effort

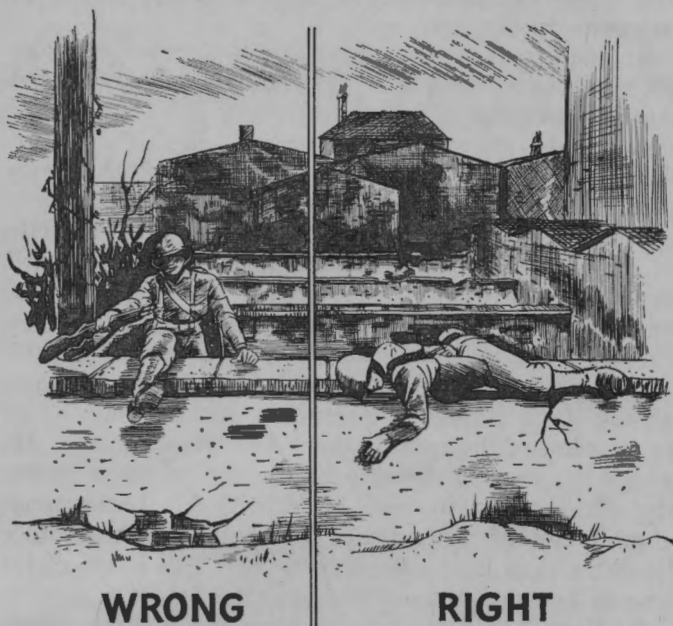


Figure 22. Crossing a wall.

is made to create and take advantage of diversions which temporarily distract the enemy's attention; for example, the use of hand smoke grenades in areas in which it is not intended to attack.

k. There are three methods of entering and clearing a house:

(1) Through the roof, upper story windows, or upper story walls; working down to the ground floor or cellar; and clearing each floor systematically.

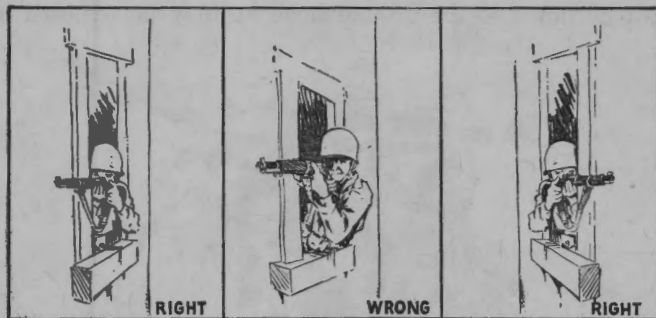


Figure 23. Firing along a street from windows.

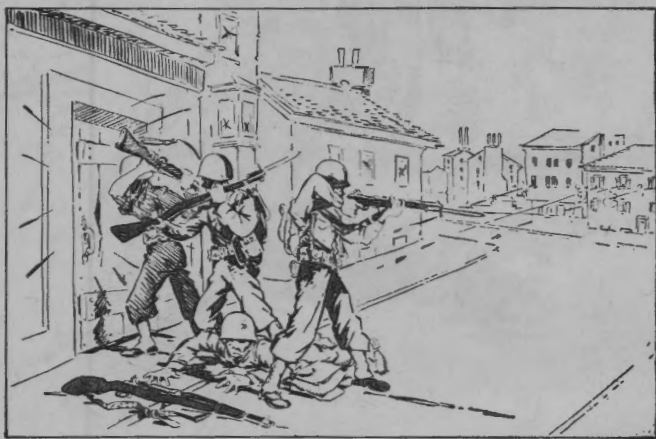


Figure 24. Do not bunch.

(2) Entry by means of a hole in the wall at ground level made by explosives.

(3) Entry effected through ground floor doors or windows.

1. Entrance through the upper part of a building is better if it is possible, because it is much easier to work down than up. (See fig. 25.) Also, when the enemy is forced down to the ground level he may be tempted to



Figure 25. Attack from above.

withdraw from the building and expose himself to the fire covering units or machine-guns. The cornered enemy will fight desperately, and therefore it is advisable to make it seem that there is an avenue of retreat open.

At the same time, somewhere along this apparent avenue of retreat the attacker's fire should destroy him.

m. Various means may be used to reach the top floor or roof of a building. Ladders, down-spouting, vines, or the roofs of adjoining buildings may be used. In many instances soldiers can climb onto the shoulders of their comrades and reach high enough to pull themselves up. If available, toggle ropes are extremely useful. These are short ropes from 4 to 6 feet long with an eye at one end and a short stick at the other. (See fig. 26.) Several toggle ropes can be joined together to form wall-scaling ropes. By attaching ropes to a grappling hook, an individual can scale a wall (see fig. 27), swing from one building to another, or use it to gain entrance to an upstairs window.

n. After clearing the rooms of an upper floor, a grenade may be thrown down before descending. One man follows it quickly, covered by his partner. Sometimes it will be impossible to use the staircase. In such cases, a hole chopped through the floor will do. A grenade dropped through this hole before descending may be effective. Another method of causing confusion among the enemy below is to place two or three grenades on the floor, pull the pins, and quickly cover them with a mattress so that the force of their explosion is directed downward. If this accomplishes nothing else, it usually will dislodge the ceiling plaster of the room below, thus filling the room with dust, confusing the enemy, and handicapping his observation.

o. Sometimes it will be impossible to enter buildings from the top. In such situations, the men must be trained to enter rapidly and to get upstairs as quickly as possible. If the stairway is barricaded and it is impossible to get upstairs *rapidly*, clear the rooms on the lower floor first. When the lower floor is clear, take steps to remove barricade on stairway as quickly as possible. Fire up through the ceilings systematically so as to create con-

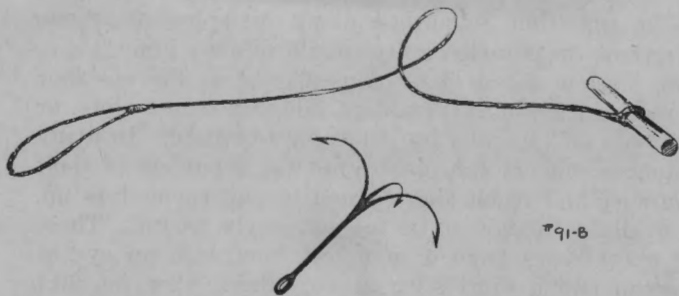


Figure 26. Toggle rope and grappling iron.

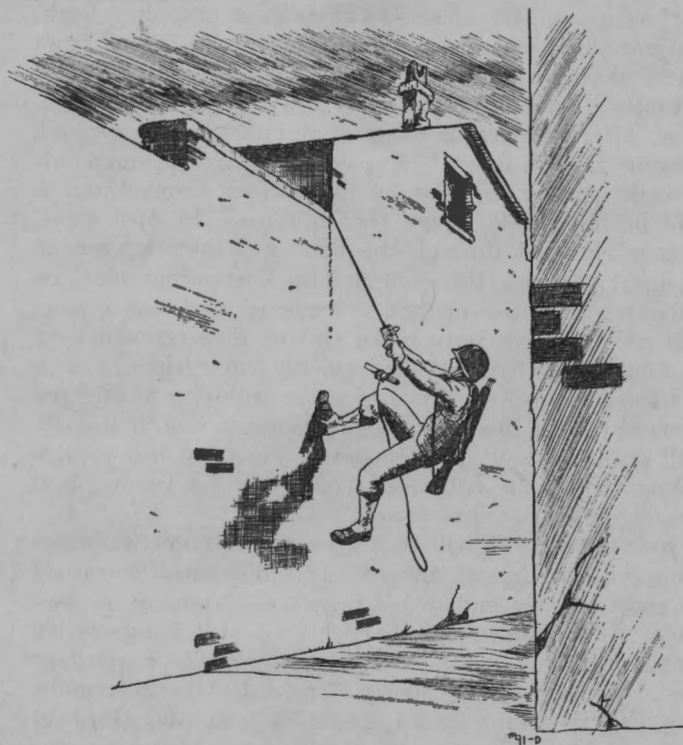


Figure 27. Use of grappling iron and toggle ropes in climbing.

fusion and disorganization in rooms above while the barricade is being removed. Modern military rifle bullets will penetrate most floors, ceilings, and interior walls. Guard against similar fire from the enemy. (See fig. 28.) Experience has shown that this expedient is not always



Figure 28. Attack through ceiling and wall.

effective, and may result in considerable waste of ammunition. It should be used only in emergency situations such as the one described above.

p. If there is reason to believe that an armed enemy occupies a room, it is suicidal to rush into that room without first killing or disabling him. It is much safer to breach a small opening and toss a grenade inside. In

entering a room believed to be occupied by the enemy, the attackers must work in pairs, using the "buddy" system, with each man alternately covering his buddy's

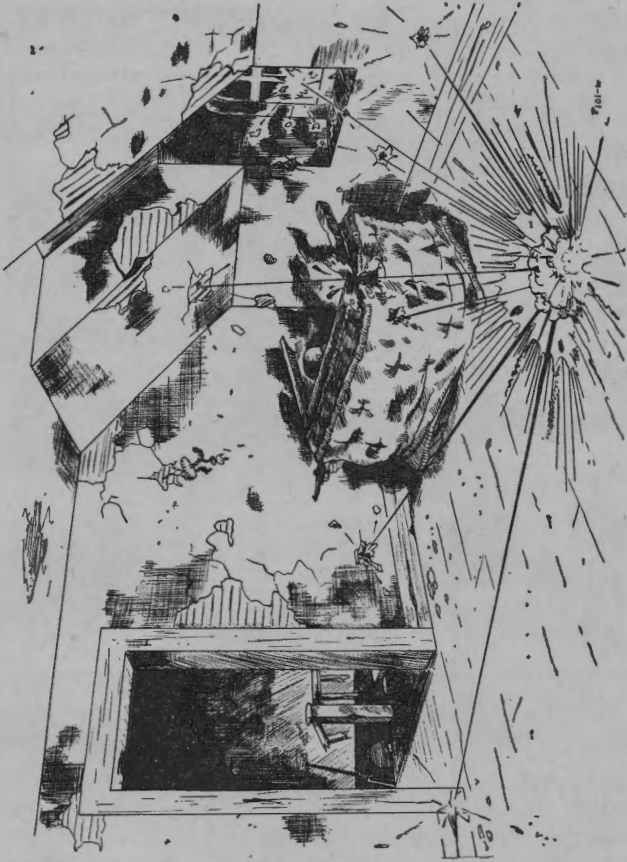


Figure 29. Corner barricade.

movements. In this system, one man throws the grenade into the room. The other rushes in immediately after the explosion, stands with his back to the wall and his

rifle ready for instantaneous use, and covers his partner as he searches the room for occupants. In entering rooms through doorways, riflemen should crouch as low as possible and jump to one side of the door. The defender usually will have his point of aim at approximately waist height. In breaching a wall, take precautions for protection from enemy fire through the wall and keep the hole covered by fire to prevent him from throwing the first grenade. Before throwing grenades at windows or doorways, look to see that they are not covered. Do not assume that a grenade bursting in a room has disabled all of the enemy. In a defended room, the enemy may erect a barricade in a corner as protection from grenades. Watch out for such a barricade and have another grenade ready to throw behind it. (See fig. 29.)

q. Search every house from attic to cellar as the advance is made. It is fatal to leave a house in your rear occupied by the enemy. In conducting this search, look for holes in the wall made to afford the enemy rapid ingress or egress. These holes will frequently be found in concealed locations, such as behind furniture, under stairways, or in cellars.

r. Make provision for a simple means of identifying buildings which have been cleared by friendly troops. The use of chalk marks constitutes an effective means.

s. If the enemy has strongly defended a building, it is less likely that booby traps will be found in it. However, precautions must never be omitted in examining defended and undefended buildings for booby traps. Electrically operated systems of booby traps make it possible for defenders to operate in the same building with less danger of detonating the charges themselves. In this type, a master switch thrown by the last defender to withdraw from the building can make the entire system effective. Other types are also used in defended buildings.

SECTION VII

ILLUSTRATIVE PROBLEM

90. RIFLE SQUAD IN ATTACK. **a. Situation.** (1) The first platoon, Company A, with the light machine-gun section attached, has arrived at Main Street and 2d Avenue (see fig. 30) with the mission of capturing the houses on both sides of Main Street between 2d and 3d Avenues. The built-up area consists of a double row of two-story brick dwelling houses with gable roofs. The back yards of these houses are inclosed by a brick wall 8 feet high. Other platoons are advancing on adjacent streets.

(2) Platoon leader's order—

“We will clear the enemy out of the houses on both sides of Main Street between 2d Avenue (pointing) and the next avenue to the north.

“Light machine-gun section cover Main Street from corner buildings A and B.

“1st Squad clear houses on right of street; cover right alley.

“2d Squad clear houses on left of street; cover left alley.

“3d Squad in support with one-half at building A and one-half at building B. Cover initial advance of 1st and 2d squads, protect machine guns, and cover rear. Automatic rifle of 3d Squad will take roof top position on building B and cover roofs of houses along Main Street. Be prepared to advance on my order.

“1st and 2d Squads will cover each other's movements as they work through their respective sides of Main Street:

“The signal for designating that a building has been cleared will be a small strip of white cloth hung from the upstairs window. On this signal the squad

on the opposite side of the street will continue its progress to next house.

"Move out at 0943. It is now 0931.

"I will be at A.

"Any questions?"

b. Standing operating procedure. A standing operating procedure (SOP) for the rifle squad in the attack

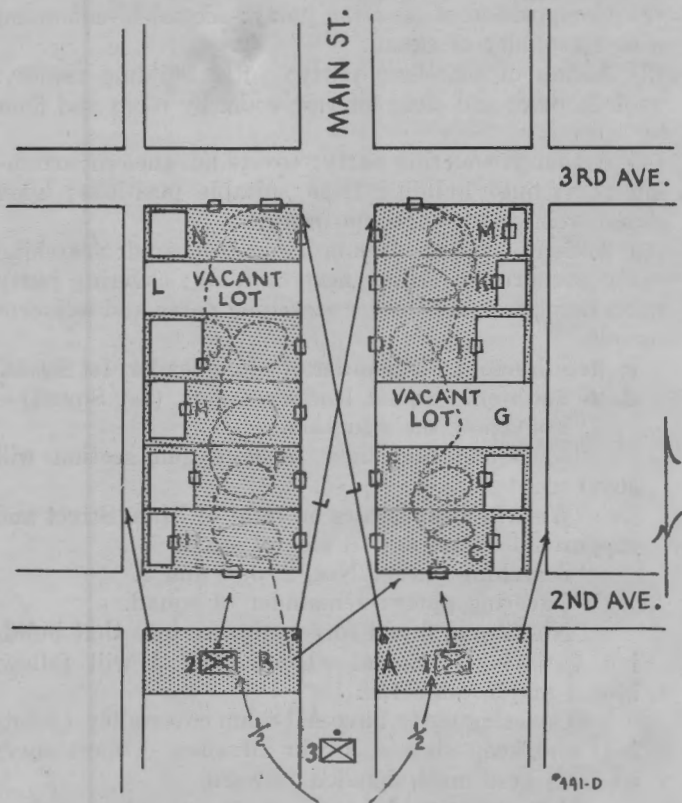


Figure 30. Rifle platoon in house-to-house fighting.

of a building is developed as the result of training in this type of operation. This training will normally be intensified when the imminence of such an operation becomes apparent. For the attack and clearance of buildings, such as presented in this illustrative problem, a standing operating procedure should cover the following: (1) Composition of searching party: squad leader with four to six riflemen.

(2) Composition of covering party: second-in-command with remainder of squad.

(3) Action of searching party: enter building rapidly, work in pairs and clear interior, room by room and floor by floor.

(4) Action of covering party: covers advance of searching party into building from suitable positions; upon signal, reinforces searching party.

(5) Action of squad after building is cleared: searching party prepares to attack next building; covering party takes new position to cover searching party and adjacent squads.

c. Requirement. The order of squad leader, 1st Squad.

d. A Solution. Squad leader's orders (1st Squad)—

"You know the situation.

"3d Squad and light machine-gun section will cover us.

"We will clear houses on right of Main Street and support 2d Squad on left side of street.

"Searching party: Nos. 2, 3, 4 and 5.

"Covering party: remainder of squad.

"Nos. 2 and 3 will force entrance into that building (pointing). Signal when clear. I will follow. Nos. 4 and 5 follow me.

"Covering party have AR team cover alley (pointing) and keep abreast of our advance. Others cover us from here until signaled forward.

"Any questions?

"Get ready. We move in 5 minutes, on my order."

CHAPTER 3

THE DEFENSE

SECTION I

GENERAL

91. MILITARY VALUE OF BUILT-UP AREAS. Cities, towns, and villages constructed of inflammable materials afford little protection. Those of masonry construction can be developed into well-fortified, tankproof islands of resistance which offer opportunities for a strong defense. The advantages are on the side of the defender. Each building and each block is a potential fort which provides such concealment that the attacker is unable to tell which is strongly defended and which is lightly held, causing him to disperse his fires and waste his ammunition. The attacker's bombardment serves to increase the camouflage of the defensive position by creating rubble and debris. Adequate underground cover is available or can be prepared so that the defender may take shelter during heavy bombardments and emerge promptly to meet the enemy assault. As the enemy infantry approaches the position, his artillery fires must lift and his bombers shift to other targets.

92. DEFENSIVE POSITION. a. The defense of a built-up area is comparable to the defense of any battle position

in that the plan of defense must insure covering the front and flanks by fire, and provide depth, mutual support, all around protection, and adequate weapon support. The built-up area to be defended must be so situated in relation to the general defensive dispositions as to force the enemy to a direct attack or a time-consuming maneuver. A position that can be readily avoided has little defensive value.

b. The main line of resistance may be either inside or outside the built-up area, but is never along a clearly defined edge. The near edge of a built-up area is a convenient registration point for artillery and is likely to be subjected to the most concentrated fire. In the usual situation, the main line of resistance may be advantageously located in suburban districts so as to command avenues of hostile approach and take full advantage of observation, fields of fire, and opportunities for flanking fire against attacking forces. The holding garrisons consist of a series of unit defense areas with supporting weapons attached, each occupying a separate tactical locality (one or more buildings or blocks of buildings) permitting small-unit control. These defense areas are distributed laterally and in depth in such manner that the fires of each cross the front or flanks of adjacent elements. Boundaries are usually located in streets and limiting points at street intersections, as these features provide unmistakable locations and facilitate mutual coordination between adjacent units.

c. All approaches must be prepared to resist the initial attack by the use of defended road blocks, barricades, mines, pill boxes, and barbed wire, with small defense areas at all advantageous locations.

d. The number and kind of obstacles that may be used are limited only by the time, materials, equipment, and labor available, and the ingenuity of the defender. However, obstacles may interfere with maneuver, supply, and evacuation of friendly troops, and may disclose

details of the position to the enemy. The type and priority of construction of obstacles is usually ordered by higher authority. Tank barriers may be improvised by blowing large craters, demolishing walls, overturning or derailling street or railway cars, and by the use of steel rails, beams, and rubble obtained from demolished buildings. Such barriers should be reinforced with antitank mines and protected by wire, antipersonnel mines, and by small-arms and antitank fire, including antitank guns, rockets, and incendiaries, from locations in nearby buildings. Such barriers will serve the dual purpose of furnishing protection from mechanized attack and attack by foot elements.

93. CIVILIAN CONTROL. Defense of a built-up area necessitates timely and effective disposition of all persons unwilling or unable to contribute to the defensive effort. It also necessitates the control of essential utilities. Where practicable, friendly inhabitants should be regimented into the defensive force, because such individuals usually have the will to resist and, if placed in a good position, can stop forces of superior military training, particularly when fighting for their own homes. Brassards or other forms of identification must be provided.

94. SUPPLY. All types of supplies should be dispersed and stocked sufficiently to sustain each tactical locality, however small, for a prolonged period in case the locality becomes isolated. Ammunition, food, water, and other critical items must be securely stored in bomb, fire, and gasproof shelters. The supply and distribution of water for personnel and fire fighting may become a major problem because of contamination or destruction of local sources of water supply. Supply plans should include plans for replenishment by aircraft and hand-carrying parties. Activities pertaining to supply and evacuation usually will be carried on at night.

SECTION II

INFANTRY REGIMENT AND ITS SUPPORTING ARMS

95. DISTRIBUTION OF TROOPS. An infantry regiment assigned to the defense of a battle position distributes its elements in three echelons: security forces, holding garrisons, and a reserve. It usually assigns two battalions to the defense of the main line of resistance and one battalion in the reserve. (See fig. 31.) The reserve battalion may be assigned an initial mission of security. The regimental commander assigns defense areas to the battalions by designating boundaries and limiting points. Elements of the antitank company and of the cannon company may be attached to battalions.

96. EMPLOYMENT OF SUPPORTING UNITS. a. Artillery. The artillery is disposed to support the outpost and mass its fires on likely avenues of hostile approach. It is usually held under centralized fire control and successively executes the following fire missions as the attack develops: the counterpreparation; fires to break up the attack after it is launched and prior to reaching the defensive positions along the perimeter of the town; barrages for the final defense of the perimeter. During the above periods the commander may decide to emplace a portion of his artillery in the vicinity of the perimeter to assist by direct laying in the final defense against the hostile attack. This command decision must state whether or not these guns are to remain in place and be sacrificed or whether they are to withdraw under certain conditions. When adequately protected, the artillery is preferably disposed in rear of and beyond the limits of the town, generally in a central location, echeloned in depth, and

so emplaced that the bulk of its fires may be massed on the critical avenues of approach and during the final defensive fires. In the event that the enemy is successful in penetrating the town, the bulk of the artillery must still be able to mass its fires against these penetrations and to support counterattacks by the defending troops. In addition, part of the artillery must be so emplaced

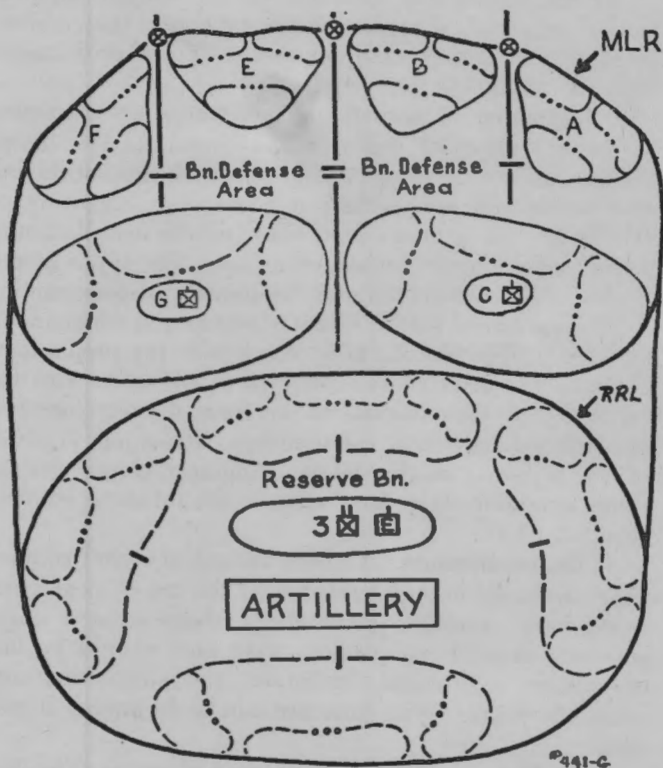


Figure 31. Organization of battle position of infantry regiment, reinforced, in built-up area—schematic.

that its fire power can be employed against envelopment of the town or against hostile forces within range that are attempting to bypass the town.

b. Antitank mine platoon. The antitank mine platoon will be employed to improve natural obstacles, construct artificial obstacles and road blocks, and lay mines. It usually will be kept under regimental control, operating under the regimental antitank officer. When engineer troops are attached to the regiment **c** below, the employment of the antitank mine platoon should be coordinated with the engineers.

c. Engineers. Attached engineer troops are employed in the execution of engineer work such as the maintenance of routes; construction of pill boxes, obstacles, and bombproof cellars and dugouts; the execution of demolition and mining operations; and the installation of booby traps and antipersonnel mines. The types of obstacles to be constructed and the priority of construction will be prescribed by the infantry regimental commander. He may charge the engineer officer with the preparation of plans for and the construction of obstacles and the execution of demolitions, or he may decentralize this function to battalion commanders, attaching engineer troops to assist in this work. Engineer troops can be made available as a final reserve for infantry combat. (See fig. 31.)

d. Communication. Organic means of signal communication should be supplemented by the use of local wires, cables, and conduits, particularly those located underground. Several independent wire lines should be laid to connect regimental, battalion, and supporting unit command posts. Wire lines are laid underground if possible.

e. Intelligence and reconnaissance platoon. The bulk of the intelligence and reconnaissance platoon is employed initially with the security forces. After the se-

curity forces have been driven in, elements of the platoon may be used to observe for enemy operations on the flanks and in rear and for patrolling.

f. Chemical units. Chemical combat troops attached to an infantry regiment may be employed to fire HE concentrations or for smoke missions.

g. Tanks. Tank units available may be employed as a mobile reserve for counterattack.

97. RESERVES. Regimental and battalion reserves are primarily intended for use to prevent encirclement, to counterattack penetrating elements, and to defend the flanks and rear. They may be held mobile in bombproof shelters or used to occupy previously prepared positions.

SECTION III

INFANTRY BATTALION

98. FRONT LINE BATTALION. **a.** A battalion occupying a defense area on the main line of resistance in a built-up area will usually be assigned a frontage of four to eight city blocks, depending on the defensive strength of the locality. The depth of the defense area may vary from three to six city blocks. The battalion is responsible for the all around defense of its assigned area, and all installations of the battalion are contained therein. For illustration of a typical battalion defense area, see figure 32.

b. The battalion commander usually places two rifle companies on the main line of resistance and holds one in reserve. All or part of the crew-served weapons, including attached cannon company, antitank and chemical weapons, may be attached to rifle companies. As soon as possible, obstacles are constructed, supplies are brought

up, and the area is fully organized for defense. Small holding detachments are provided by the reserve company for its defense areas.

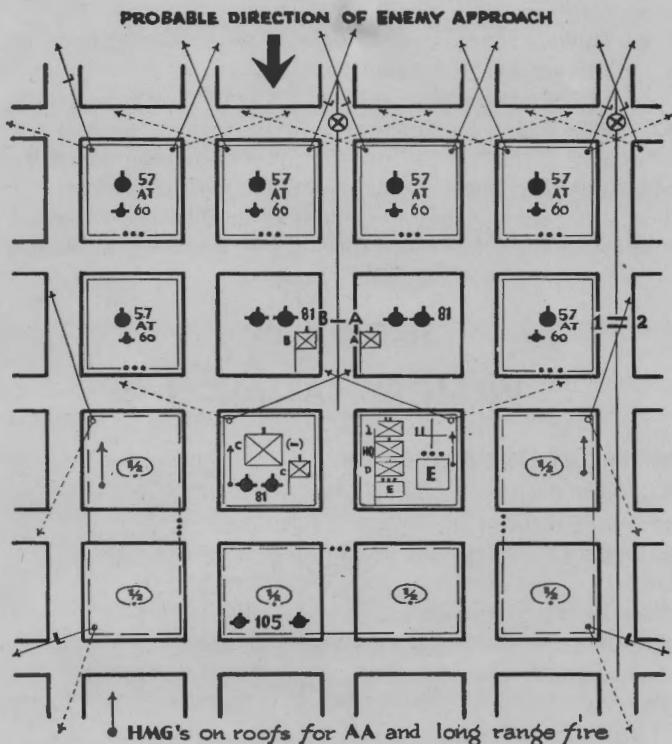


Figure 32. Front line battalion defense area in built-up area, with one cannon platoon, one 57-mm antitank gun platoon, and one engineer platoon attached. Crew-served weapons are attached to subordinate units as shown. Streets, alleys, and passageways are blocked with tank obstacles, antitank and antipersonnel mines, and barbed wire—schematic diagram.

99. RESERVE BATTALION. The reserve battalion usually organizes its position in the rear portion of the regimental area so as to complete the all around defense of the regimental sector. After completing the organization of its assigned defense areas, the battalion (less small holding garrisons left in each defense area) usually is assembled in bombproof shelters prepared to counterattack any penetration of the regimental sector or to occupy its previously prepared positions. Elements of the reserve battalion may be employed initially on security missions or, in certain situations, held in readiness outside the built-up area to prevent encirclement.

100. EMPLOYMENT OF SUPPORTING UNITS. **a. Battalion headquarters company.** Battalion intelligence personnel will establish a system of protected observation posts from which the front and flanks of the battalion area may be observed. Advantage should be taken of high buildings for this purpose. The probable effect of enemy shelling and bombing, and limitation of visibility by smoke, must be kept in mind and a number of alternate observation posts prepared. The battalion communication system should be established so as to make the maximum use of the sound-powered telephone and visual signaling equipment available. Wires are laid through cellars or placed underground. Attempts to jam the radio system may limit or prevent the effective use of the battalion radio equipment. All men available for use as messengers must be familiar with the battalion area and protected routes to and from the regimental command post. Elements of the antitank platoon usually are attached to front line companies. Personnel of the ammunition and pioneer platoon not required for ammunition supply may be assigned elementary engineering tasks or grouped with attached engineers.

b. Engineers. Engineer troops, if attached, are employed to construct or remove obstacles and other works

requiring special equipment and specialized training, such as barricades, and pill boxes, and to execute demolitions and install booby traps. They may be grouped with the ammunition and pioneer platoon of the battalion headquarters company. They are also available as a reserve for combat.

SECTION IV

RIFLE COMPANY

101. DISTRIBUTION OF RIFLE COMPANIES. a. Front

line companies. (1) Usually two rifle platoons are assigned defense areas on the main line of resistance and one rifle platoon in the company support area. (See fig. 32.) Platoon defense areas are located so as to be mutually supporting and capable of all around defense. Available 57-mm antitank guns, machine guns, and 60-mm mortars are usually attached to rifle platoons. If other crew-served weapons, such as 105-mm howitzers, 81mm mortars, and 4.2-inch chemical mortars are attached to front line companies, they are usually held under company control.

(2) A rifle company occupying a defense area on the main line of resistance in a built-up area usually will be assigned a frontage of two to four city blocks, depending on the defensive strength of the locality. The depth of the company area may vary from two to three city blocks.

(3) Each front line company should decentralize its supply plans by distributing ample quantities of all critical items to each defense area.

b. Reserve company. The reserve rifle company usually organizes its position in the battalion rear area so as to complete the defense of the battalion area, and

protects the flanks and rear. (See fig. 32.) After completing the organization of assigned defense areas, the company (less small holding garrisons left in each defense area (see fig. 32)) is assembled in bombproof shelters prepared to counterattack any penetration of the battalion area or to occupy its previously prepared positions. Elements of the reserve company may be employed on security missions.

SECTION V

RIFLE PLATOON

102. TACTICAL EMPLOYMENT. **a. Defense area.** In the defense of a built-up area, a rifle platoon, with crew-served weapons attached, may be employed to organize and defend a tactical locality on the main line of resistance, in the company support area, or in the battalion reserve area. It normally occupies one defense area. For an illustration of a typical rifle platoon defense area and a method of occupation thereof, see figure 33.

b. Organization of platoon area. (1) A rifle platoon defending a tactical locality assigns each rifle squad to a clearly defined area of responsibility. The platoon area is systematically organized into a fortified position for all around defense by skillfully emplacing the attached crew-served weapons, improving local fields of fire, constructing obstacles to both mechanized attack and attack by enemy foot troops, preparing bomb and gasproof shelters, storing ample quantities of ammunition, food, water, medical supplies, and equipment for a prolonged defense, and establishing a reliable system of communication with adjacent and higher units. Having organized the defense, the available personnel is then divided into

two reliefs, with one relief constantly on duty while the other relief is resting. During an alert the position is fully manned.

(2) Sentries should be posted outside a building whenever possible, especially at night. They should be on

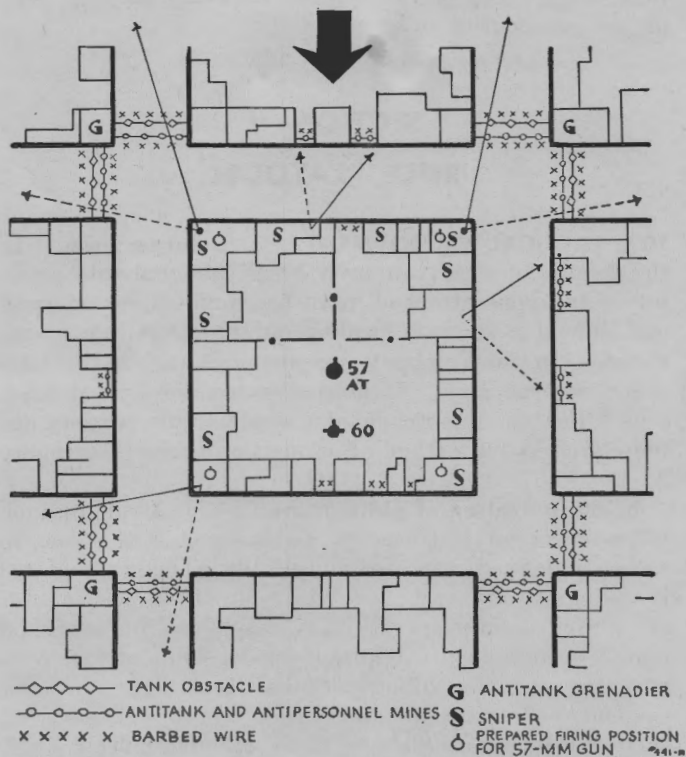


Figure 33. Defense area of rifle platoon in built-up area, with one machine-gun section, one 60-mm mortar squad, and one 57-mm antitank gun squad attached—schematic diagram. Positions of the relief on duty only are shown; the other relief is resting.

ground level, and on the roof if the latter is accessible to the enemy. From the outside they will be in a better position to listen for and investigate any movement.

103. DEFENSE OF BUILDINGS. In preparing buildings for defense, the first consideration is the selection of buildings of solid construction suitably located for the accomplishment of the tactical mission. Buildings which are so located or so inflammable as to weaken the defensive position may be demolished or burned, if such action will not unduly disclose to the enemy the details of the position. If extensive demolition is required, the approval of higher authority should first be obtained. The next step is the organization of each selected building for all around defense by the disposition of squads and individuals; the assignment of principal, alternate, and supplementary positions to attached crew-served weapons; improvement of fields of fire by the removal of fences, hedges, and outbuildings that obstruct the view; and by the construction of obstacles. Machine guns assigned to close-defense missions are emplaced on or near the ground level so as to command the avenues of approach; those given antiaircraft or long-range fire missions are usually located on the roof. Antipersonnel mines and booby traps (see FM 5-30) should be installed in buildings which are not occupied or from which the defenders are withdrawing.

SECTION VI

RIFLE SQUAD AND INDIVIDUAL

104. ORGANIZATION OF A FORWARD SQUAD DEFENSE AREA. a. **General.** The platoon leader's defense order assigns to the rifle squad the building or buildings

to be occupied and defended, the obstacles to be constructed, a specific area of responsibility, and general locations and principal directions of fire for the automatic rifleman and the antitank rifle grenadier. The location and sector of fire of members of the squad and the assignment of individuals to reliefs and duties are functions of the squad leader.

b. Position of squad. During an alert the squad defenses are manned by all available personnel and weapons. At other times the squad is divided into two reliefs with one relief on duty while the other relief is resting, as follows:

First relief

Sergeant, in charge.
Private, automatic rifleman.
Private, AT grenadier.*
Private, rifleman.
Private, rifleman.
Private, rifleman.

Second relief

Corporal, in charge.
Private, automatic rifleman.
Private, AT grenadier.*
Private, rifleman.
Private, rifleman.
Private, rifleman.

* Assigned by squad leader.

105. PRECAUTIONS AND SUGGESTIONS. The methods and expedients indicated below should guide squad leaders and individuals in the preparation of buildings for defense:

a. Every defensive measure should be taken to prevent the enemy from getting above the defender and fighting his way down.

b. Principal, alternate, and supplementary loopholes for riflemen and for all weapons should be prepared, reinforced, and camouflaged. Loopholes may be made high so that the firer can fire from a platform, or low so that he can fire from the prone position. Low loopholes are blocked with sandbags when not in use. It is good practice to fire successive shots from different loopholes, if practicable. Dummy loopholes and dummy heads may be used to draw the enemy's fire. (See fig. 34.)



Figure 34. Loopholes in unexpected places.

- A. Loophole behind vine.
- B. A few tiles have been lifted on roof. In this case the same thing should be done in several places or dark patches painted on roof as dummy loopholes.
- C. Loophole under shadow of porch, over the door.
- D. Loophole at ground level behind bush.
- E. Loophole under the eaves. Dummies should be painted all along under the gutter.

This illustrates the axiom, "If you cannot entirely conceal it, make dummies like it."

c. Use great care in the selection of firing positions. Always try to fire from unexpected places. Weapons which are to be fired from windows or large openings should be located well back in the rooms. The area in front of the weapon should be wet to avoid dust and consequent disclosure of position by muzzle blasts. Do not allow the muzzle of a weapon to project from cover. Snipers should make frequent changes of position.

d. Remove or sandbag windowpanes to prevent injury from flying glass. Screen or close openings, including the chimney, to exclude grenades. Place curtains over the upper portion of openings to darken the room and prevent observation by the enemy.

e. Guard against surprise, demolition, and fires. Trip or barbed wires with tin cans on them may give timely warning of enemy approach. The floor over basement dugouts or occupied rooms should be reinforced and fire-proofed with wet earth or masonry. Keep some fire fighting equipment in readiness for instant use. Remove inflammable materials.

f. Prepare one or more well camouflaged and sand-bagged observation posts in the attic or upper story. These locations may also be used for sniping or to prevent enemy infiltration over the roof.

g. LOOK OUT FOR BOOBY TRAPS, especially if the enemy has previously occupied the building.

h. Always keep one exit available. Breach the walls of interior rooms in concealed places, such as behind heavy furniture, under stairs, or other places not easily discovered by the enemy.

i. Barricade the openings. Doors required for your own use should be bulletproofed by placing sandbags behind them, and the opening restricted to the minimum necessary for passage. The opening should be so located that the enemy cannot see into the room. In some cases it may be necessary to rehang the door to effect this safety precaution.

j. Bulletproof parts of all upper floors, particularly the landings. This can be done with sandbags and will afford protection from enemy fire directed up through the floor.

k. Try to keep an empty room between you and the enemy if he is attempting to breach the wall of the building you are in; otherwise you may be killed by the blast.

Immediately after the explosion, take position to fire through the hole keeping alert for any hand grenades thrown through the hole.

l. Drop grenades out of windows on an enemy in the street below. A slit in the screen will permit this.

m. Remove down-spouts, or anything by which an enemy may climb the side of the building.

n. Fire through the walls or door if the enemy gains access to an adjoining room; fire through the ceiling, if he is upstairs; fire through the floor, if he is downstairs. (See fig. 28.) The caliber .30 bullet will penetrate most interior walls and floors.

o. Prepare observation holes in the floors and walls and cover them with a sandbag.

p. If you are forced out, retreat toward the upper story, unless you have a safe exit prepared in the cellar. It is easier to throw grenades downstairs from upper landings than to throw them upward. Prepare a means of escape from upstairs rooms.

q. Prepare a barricade in the corner nearest the door, if you are cut off and unable to escape from a room (see fig. 29), and *fight*.

CHAPTER 4

TRAINING

SECTION I

OBJECT

106. GENERAL. Training for fighting in built-up areas must be directed largely to the development by means of demonstration, lecture, and practice of confidence in the use of special methods involved. Each individual must feel not only that he is an expert in such combat, but also that he is certain that the man and subunits alongside him are equally expert and can be depended upon to do their job in the actual fighting, although perhaps out of sight and hearing of himself and of each other.

SECTION II

METHODS

107. TRAINING AREAS. For elementary training a great deal of use can be made of a single house, but at least a small built-up area, including a street, is required for more advanced training, in order to allow those being trained to become accustomed to the feeling of moving in, around, and over buildings for purposes other than those

to which they have been accustomed. Normally, realistic training areas can be found within theaters of operations. Built-up areas that have been the scene of recent military operations usually are appropriate for advanced training.

108. LECTURES. Short lectures and training films serve as a useful means of introduction and orientation to demonstrations and for working up interest.

109. DEMONSTRATIONS. These are particularly suitable for this form of training. The area required to stage a demonstration can be small and, yet given good preparation and a sense of showmanship, offers scope for many valuable lessons.

110. MODELS. Built-up areas can be easily portrayed by means of sand table models, dolls' houses, and mock-ups.

111. AERIAL PHOTOGRAPHS. Vertical photographs and vectographs are useful for conducting indoor exercises and for discussions, as they bring out clearly many characteristics of built-up areas.

112. EXERCISES. Whether conducted for individuals or units, the provision of an enemy and battle noises makes for realism. The enemy should be carefully controlled to avoid an undue number of clashes and to simplify umpiring. For small exercises, those not taking part can learn much by acting as observers.

SECTION III

STAGES

113. ELEMENTARY TRAINING. The start of training should be devoted principally to introducing the indi-

vidual to this particular type of action; to teaching him its characteristics; to increasing his knowledge of items such as types of walls, drains, manholes, attics, eaves, roofs, shafts, and cellars; to giving him practice in movement both by day and by night; and generally to making him appreciate the combat potentiality of a built-up area.

114. ADVANCED INDIVIDUAL TRAINING. This stage should include the finer points in use of weapons and explosives, the recognition and location of fire, agility, stealthy movement and bold, rapid movement, the selection of positions and use of cover, observation, and the preparation of a house for defense.

115. TEAMWORK. The development of teamwork should include the teaching of group action, and generally the welding of individuals into teams.

INDEX

	<i>Paragraphs</i>	<i>Page</i>
Aerial:		
Bombardment.....	20, 47, 55, 63, 91	21, 47, 51, 59, 95
Photographs.....	21, 43, 56, 75, 111	22, 45, 52, 68, 113
Air:		
Force, tactical and strategic.....	55-56	51, 52
Parties.....	61	60
Reconnaissance.....	19, 21, 23, 47, 75	21, 22, 24, 47, 68
Superiority.....	15, 47, 63	18, 47, 59
Airborne units.....	48	48
Alternate plans.....	75	68
Alternate positions.....	18, 103	20, 107
Ammunition.....	26, 28-29, 76	26, 30, 70
Antiaircraft:		
Artillery.....	13, 14, 26, 49	14, 15, 26, 48
Defense.....	47, 63, 103	47, 59, 107
Antipersonnel mines.....	4, 12, 56, 92, 103	2, 13, 52, 95, 107, 113
Antitank:		
Company.....	85, 95	79, 98
Mine platoon.....	96	98
Mines.....	4, 12, 22, 78, 92	2, 13, 24, 71, 95
Obstacles. (See Obstacles.)		95
Officer.....	96	98
Weapons. (See Direct fire guns.)		
Approach, avenues of.....	19, 92, 103	21, 95, 107
Armament.....	38-39	40
Armor plate.....	8, 31	8, 33
Armored units.....	50, 59	48, 55, 56
Artillery:		
Barrages.....	51, 96	48, 98
Bombardment.....	20, 23, 55-56, 63, 70, 73	21, 24, 51-52, 60, 62

Artillery—Continued.	<i>Paragraphs</i>	<i>Page</i>
Counterbattery.....	14, 47	15, 47
Counterpreparation.....	14, 23, 35, 96	15, 24, 38, 98
Displacement.....	14, 56	15, 53
Emplacements.....	7, 11, 13	6, 10, 14
Forward observer.....	78	71
Positions.....	14, 33, 77, 96	15, 37, 71, 98
Preparation.....	23, 55	24, 50
Support.....	14, 51, 67, 78, 96	15, 48, 71, 98
Superiority.....	63	59
Assault units:		
Detachments.....	78, 85	71, 79
Missions.....	38, 78, 82, 88	40, 71, 78, 81
Operations.....	55-56, 90	51-52, 92
Organization.....	38-39	40
Training and technique..	40, 89	44, 82
Attachment:		
Antiaircraft, artillery....	39	41
Antitank company elements.....	80, 98, 101	75, 101, 104
Assault detachments.....	83	78
Cannon company elements.....	39, 80, 98, 101	41, 75, 101, 104
Chemical.....	54, 78, 101	50, 71, 104
Direct-fire guns.....	37, 39	39, 41
Engineers.....	39, 52, 78	41, 50, 71
Field artillery.....	51	48
Heavy weapons.....	80, 101	75, 104
Tank destroyer.....	39, 53	41, 50
Tanks.....	78	71
Weapons platoon.....	101	104
Attack:		
Conditions for success of..	41	44
Conduct of.....	56, 85, 89	52, 79, 82
Phases of.....	42, 75, 77-78	46, 68, 70-71
Automatic rifle.....	89-90, 104	82-83, 107
Bangalore torpedo.....	31	33
Barricades.....	85, 89, 92, 105	79, 82, 95, 108
Barriers.....	15, 78, 92	18, 71, 95
Basements.....	69-70	62-63
Battalion, infantry.....	79, 98, 99	74, 101, 103
Beehive charge.....	31	33
Bombing. (See Aerial bombardment.)		
Bombs.....	27	28
Booby traps.....	12, 89, 103, 105	13, 82, 107, 108

	<i>Paragraphs</i>	<i>Page</i>
Boundaries.....	79, 92, 95	74, 95, 98
Break-through.....	55-56, 59, 63	51-52, 55, 59
Buildings:		
Blocks of.....	69, 79	62, 74
Bulletproof.....	105	108
Clearing of.....	87-89	81-82
Defense of.....	103-105	107-108
Density of.....	70, 79, 82	63, 74, 78
Fireproofed.....	105	108
Fortified.....	73, 78	66, 71
Isolated.....	69	62
Reinforced.....	105	108
Built-up areas.....	67-70, 91	61-63, 95
Bunkers.....	5, 8, 14, 17, 18, 23, 38	5, 8, 15, 19, 20, 24, 40
Camouflage.....	14, 17, 23, 55, 91, 105	15, 19, 24, 51, 95, 108
Cannon fire, effect of.....	25-26	26
Cellars. (<i>See</i> Basements.)		
Centers of resistance.....	14, 91	15, 108
Chemical troops.....	54, 78, 96	50, 71, 98
Civilians.....	74, 93	66, 97
Communication.....	15, 22, 37, 62, 63, 67, 70, 96	18, 24, 39, 59, 61, 63, 98
Company:		
Antitank. (<i>See</i> Attachment.)		
Battalion headquarters..	100	103
Cannon. (<i>See</i> Attachment.)		
Heavy weapons.....	60, 80	59, 75
Rifle.....	82, 101	78, 104
Concealment.....	13, 17, 56, 67, 91	14, 19, 52, 60, 95
Concrete works.....	26, 31	26, 33
Contact.....	19	21
Contamination.....	56, 94	52, 97
Control.....	37, 56, 70, 75, 89, 92	39, 52, 63, 68, 82, 95
Coordination.....	15, 40	18, 44
Counterattack.....	14, 15, 56, 78, 81, 95, 101	15, 18, 52, 71, 77, 98, 104
Counterintelligence.....	74	66
Cover.....	14, 55, 67, 70, 89, 91	15, 51, 61, 63, 82, 95
Covering:		
Fire.....	56, 70, 87, 89-90	52, 63, 81, 82-83
Party.....	89	82
Craters (<i>see also</i> Cover).....	47, 51, 55	47, 48, 51

	<i>Paragraphs</i>	<i>Page</i>
Darkness.....	35, 44, 56, 94, 102	38, 46, 52, 97, 105
Dead spaces.....	4, 33, 56	2, 37, 52
Decentralization of control....	67, 75, 89	61, 68, 82
Deception.....	18, 23, 55, 72, 78	20, 24, 51, 66, 71
Decontamination.....	56	52
Defense: (<i>See</i> Fortified.)		
Antiaircraft.....	47, 49, 103	47, 48, 107
Areas.....	68, 98, 101-102	62, 101, 104-
Defensive position.....	92, 95	95, 98 105
Density, permanent works.....	14, 59	15, 55
Depth in.....	11, 14, 98, 101	10, 15, 101, 104, 108
Distribution of troops....	95, 98, 101	98, 101, 104
Doctrine (German).....	14-15	15
Mobile.....	91	103
Static.....	91	103
Defilade.....	11, 19, 33, 37-38	10, 21, 37, 39
Defile.....	49	48
Demolition.....	31, 58, 103	33, 51, 107
Density of buildings.....	70, 79, 82	63, 74, 78
Depth in defense.....	11, 14, 98, 101	10, 15, 101,
Destruction:		104
Of buildings.....	76, 80, 85	70, 75, 79
Of permanent works.....	31-33, 36-39, 51, 56, 58	33, 38, 48, 52, 54
Detonation.....	36, 67, 70	38, 61, 63
Direct fire:		
Characteristics.....	32	37
Conduct of.....	36	38
Guns (<i>see also</i> Cannon).....	26, 49-51, 53, 60, 63	26, 48, 50, 55, 59
Occupation of positions....	35	38
Organization of positions....	34	38
Selection of positions.....	33	37
Tactical considerations....	37, 80, 96	39, 75, 98
Direction, maintenance of....	78	71
Ditches, tank.....	12	13
Diversions.....	89	82
Dragon's teeth.....	12	13
Embrasures.....	8, 17	8, 19
Emplaced weapons fire.....	4	2
Emplacements.....	4, 6-7, 9, 11, 22, 102	2, 5, 10, 24, 105
Encirclement.....	4, 75	2, 71
Engineers.....	22, 39, 52, 56, 78, 96, 99	24, 41, 50, 52, 71, 98, 103

	Paragraphs	Page
Entrances (concrete works)-----	5, 8, 10, 19	5, 8, 10, 21
Entrenchments-----	9, 13	10, 14
Entry (buildings)-----	89	82
Envelopment-----	41, 81	45, 77
Equipment-----	38-39, 56, 63, 88, 102	40, 52, 59, 81, 105
Exploitation-----	42, 59, 63	44, 55, 56, 59, 61
Explosive charges, hand- placed-----	31, 58, 71, 88	33, 54, 65, 81, 108
Exits (buildings)-----	105	108
Feints-----	23	24
Field fortifications-----	9, 14, 18, 39, 55	10, 15, 20, 41, 52
Field of fire-----	5, 17, 67, 77, 92, 103	5, 19, 61, 70, 95, 107
Fire:		
Cannon, effect of-----	25-26	26
Covering-----	56, 70, 87, 89-90	63, 81, 92
Direct-----	32-37, 60	37, 55
Dispersion-----	36	38
Emplaced weapons-----	4	2
Flanking-----	4, 37, 92	2, 39, 95
From embrasures-----	7	6
Grazing-----	4	2
Indirect-----	32, 36, 51	37, 38, 48
Location of-----	70	63
Preparatory-----	55-56	51-52
Protective-----	4, 14, 23	2, 15, 24
Sector of-----	104	107
Supporting-----	32-37, 56, 60, 78, 96	37, 52, 55, 71, 98
Flame thrower-----	30, 39, 60	31, 41, 55
Flat trajectory guns. (See Direct fire.)		
Fog-----	35, 56	38, 52
Formations-----	56, 79, 82, 84	52, 74, 78, 79
Fortifications:		
Permanent-----	3-4, 14, 15, 23, 57	1, 15, 24, 53
Fortified:		
Areas-----	91	95
Belts-----	11, 18, 56	10, 20, 52
Buildings-----	73, 105	66, 108
Lines-----	3-4, 14, 42	1, 15, 44
Localities-----	3, 57	1, 53
Positions-----	3-4, 38, 42, 56, 102	1, 40, 44, 52, 105
Zones-----	3, 4, 11, 14	1, 2, 10, 15

	<i>Paragraphs</i>	<i>Page</i>
Forts.....	4-5, 11, 18, 57, 91	2, 10, 20, 53, 95
Frontages.....	38, 56-57, 78, 84, 101	40, 52-53, 71, 79, 82, 104
Garrison.....	92, 101	95, 104
Grenades:		
Hand.....	56, 76, 89, 105	52-66, 82, 108
Rifle.....	29, 39	30, 41
Grenadier, rifle.....	104	107
Ground reconnaissance.....	19-20, 71, 75, 96	21, 65, 68, 98
Hand-carrying parties.....	76, 94	70, 97
Hand-placed explosive charges.....	31, 58, 71, 88	33, 54, 65, 81
Heavy weapons company.....	60, 76, 78, 80	55, 70, 71, 75
Houses. (See Buildings.)		
Identification.....	61, 89, 93	58, 82, 97
Incendiaries.....	73, 75, 105	66, 68, 108
Indirect fire.....	32, 36, 51	37, 38, 48
Infantry:		
Battalion.....	60, 79, 98, 99	55, 74, 101, 103
Regiment.....	77, 95	70, 98
Weapons.....	28-29	30
Infiltration.....	71	65
Information.....	16, 19-23, 67, 70, 75	19, 21, 61, 63, 68
Initiative.....	40, 67, 70, 86	43, 61, 63, 81
Installations.....	7, 20, 98	6, 21, 101
Intelligence.....	16-23, 63, 75, 96	19, 59, 68, 98
Isolated works.....	11, 39	10, 41
Isolation.....	42, 57, 67, 75	44, 53, 61, 68
Landscape.....	17	19
Launchers, rocket.....	88	81
Liaison.....	51, 56	48, 52
Limiting points.....	92, 95	103, 105
Loopholes.....	105	108
Looting.....	74	66
Main line of resistance.....	92, 101	95, 104
Maneuver.....	57, 70, 78, 92	53, 63, 71, 95
Materials.....	92	95
Mechanized attack.....	67, 80, 102	61, 75, 105
Messengers.....	62, 70, 96	59, 63, 98
Methods, entering and clearing buildings.....	89	82

	<i>Paragraphs</i>	<i>Page</i>
Mine fields.....	31, 52, 56	33, 48, 52
Mines:		
Antipersonnel.....	4, 12, 56, 92, 103	2, 13, 52, 95, 107
Antitank.....	4, 12, 22, 78, 92	2, 13, 24, 71, 95
Missions of supporting arms:		
Air force.....	47	47
Airborne units.....	48	48
Antiaircraft.....	49, 77	48, 70
Armored units.....	50	48
Chemical troops.....	54, 78, 96	50, 71, 98
Engineers.....	52, 78, 96	50, 71, 98
Field Artillery.....	51, 78, 96	48, 71, 98
Tank destroyer.....	53	50
Tanks.....	78, 96	71, 98
Mobility.....	42, 50-51, 53, 56, 91, 97	44, 48, 50, 52, 95, 108
Mopping-up.....	56, 58, 75, 78	52, 54, 68, 71
Movement.....	54, 87, 89	50, 81, 82
Mutual support.....	14, 56, 92, 101	15, 50, 95, 104
Neutralization of fires.....	32-37, 44, 56, 70	37, 46, 52, 63
Night operations.....	35, 45, 56, 71	38, 46, 52, 65
Noise, effect of.....	70-71	63-64
Objectives.....	42-43, 56-57, 59, 68, 77, 82, 84	44-45, 52-53, 55, 62, 70, 78
Observation.....	15, 18, 54, 67, 101	18, 20, 50, 61, 104
Posts.....	5, 20, 70, 100	5, 21, 63, 103
Obstacles.....	4, 12, 15, 17, 22, 52, 55, 56, 63, 92, 102	2, 13, 18, 19, 24, 50, 51, 52, 59, 95, 105
Operations:		
Assault units.....	55-56, 60, 90	51-52, 55, 92
Mopping-up.....	56, 58	52, 54
Night.....	35, 45, 56, 71	38, 46, 52, 65
Preliminary.....	44, 55	46, 51
Orders.....	43, 90, 104	45, 92, 107
Organization, assault units.....	38-39	40-41
Organized position.....	77	70
Outpost.....	55, 96	51, 105
Passage of lines.....	56, 60, 81, 83, 85	52, 55, 77, 78, 79
Patrols, reconnaissance.....	20, 71, 75, 96	21, 65, 68, 98

	<i>Paragraphs</i>	<i>Page</i>
Penetration:		
Troops-----	56-57, 99, 101	52-53, 103, 104
Weapons-----	25-31	26
Perforation (weapons)-----	25-31, 33, 36	26, 37, 38
Perimeter-----	96	98
Phases of attack-----	42, 75, 77-78	44, 68, 70-71
Photographs, aerial-----	21, 43, 56, 75, 111	22, 48, 52, 68, 113
Pill boxes (<i>see also</i> Bunkers)---	5, 12, 69, 92	5, 13, 62, 95
Plans-----	16, 43, 75, 77-78, 82, 92	19, 45, 68, 70, 78, 95
Platoon:		
Ammunition and pioneer-----	60, 80	55, 75
Antitank mine-----	96	98
Intelligence and recon- naissance-----	96	98
Rifle-----	39, 82-83, 102	41, 78, 105
Pole charges-----	31	33
Ports, firing-----	8, 56	8, 52
Positions. (<i>See</i> Fortified.)		
Alternate-----	18, 103	20, 107
Direct fire-----	34-35	38
Organized-----	77	70
Principal-----	103	107
Supplementary-----	103	107
Supporting-----	75	68
Preparation of buildings for defense-----	105	108
Prisoners-----	74-75	66
Protection-----	14, 56, 67, 92	15, 52, 61, 95
Pyrotechnics-----	62, 70	59, 63
Quarters, sheltered-----	6	5
Radio-----	15, 62, 96, 100	18, 59, 98, 103
Reconnaissance:		
Air-----	19, 21, 47, 75	21, 22, 47, 68
Ground-----	19-20, 71, 75, 96	21, 65, 68, 98
Patrols-----	20, 71, 75, 96	21, 65, 68, 98
Reduction, permanent works. (<i>See</i> Destruction.)		
Regiment, infantry-----	77	70
Rehearsal-----	40, 55, 77	43, 51, 70
Reinforcement-----	38-39, 85	40, 79
Reliefs-----	102, 104	105, 107
Reorganization-----	39, 56, 85	41, 52, 79
Reports-----	82, 84	78, 79.

	<i>Paragraphs</i>	<i>Page</i>
Reserves.....	14, 42, 56, 78, 81, 97, 99, 101	15, 44, 52, 71, 77, 101, 103, 104
Resistance, center.....	14, 91	15, 95
Reverse slopes.....	57	53
Rifle:		
Company.....	37, 39, 60, 82, 101	39, 41, 55, 78, 104
Platoon.....	39, 60, 82-83, 102	41, 55, 78, 105
Squad.....	39, 60, 86-89, 104-105	41, 55, 81, 107
Support.....	60	55
Support.....	92	95
Roadblocks.....		
Rocket, launcher.....	29, 56, 60, 83	30, 52, 55, 78
Roofs.....	70, 85, 89, 103	63, 79, 82, 107
Sandbags.....	105	108
Satchel charge.....	31	33
Searching party.....	89	82
Secrecy.....	35, 43	38, 45
Sectors of fire.....	104	107
Security.....	15, 56, 59, 70, 95	18, 52, 55, 63, 98
Sentries.....	102	105
Shaped charges.....	31, 58	33, 54
Shelter (<i>see also</i> Cover).....	55, 91	51, 95
Shelters.....	10, 17, 85, 102	10, 19, 79, 105
Signals. (<i>See</i> Communica- tion.)		
Small arms.....	28, 32, 37	30, 37, 39
Smoke.....	18, 23, 44, 72	20, 24, 46, 66
Snipers.....	70, 85, 105	63, 79, 108
Sound-powered telephone.....	62, 100	59, 103
Special equipment.....	39, 58, 88	41, 54, 81
Streets and alleys.....	67, 69, 77, 89	61, 62, 70, 82
Supply.....	76, 94, 102	70, 97, 105
Support:		
Mutual.....	14, 56, 92, 101	15, 52, 95, 104
Platoon.....	39, 83	41, 78
Squad.....	39, 90	41, 92
Supporting:		
Arms.....	47-54, 77, 85	47, 70, 79
Fires.....	32-37, 56, 78, 96	37, 52, 71, 98
Positions.....	75	68
Units.....	39, 55-56, 60, 62, 83, 96, 100	41, 51, 55, 59, 78, 98, 103
Surprise.....	14, 43, 89, 105	15, 45, 82, 108

Tactical:	<i>Paragraphs</i>	<i>Page</i>
Considerations, direct fire.....	37	39
Localities.....	3, 92, 98, 102	1, 95, 101, 105
Tank-destroyer units.....	53	50
Tanks.....	45, 50, 56, 67, 78, 96	46, 48, 52, 61, 71, 98
Technique, assault units.....	60, 89	55, 82
Telephone, sound-powered.....	62, 100	59, 103
Terrain.....	14, 15, 22, 57	15, 18, 24, 53
Topography.....	67	61
Torpedo, bangalore.....	31	33
Traffic.....	76	70
Training.....	39-40, 78, 86, 106-115	41, 71, 81, 112
Troop shelters. (<i>See Shelters.</i>)		
Turrets.....	5, 6, 8, 47	5, 8, 47
 Underground:		
Forts.....	5	5
Installations.....	5, 18	5, 20
Passages.....	13, 18	14, 20
Shelters.....	10, 17	10, 19
Tunnels.....	8, 14	8, 15
Works.....	56, 58	52, 54
Visibility.....	34, 70, 100	38, 63, 103
 Weapons:		
Bombs.....	27	28
Capabilities and characteristics.....	24-31	26
Development of.....	24	26
Direct fire.....	25-26, 32, 60	26, 37, 55
Emplacements.....	4, 6-7, 9, 11, 85, 102	2, 5, 10, 78, 105
Explosive charges, hand-placed.....	31, 58	33, 54
Flame thrower.....	30, 60	31, 55
Grenades, rifle.....	29	30
Penetration.....	25-31	26
Perforation.....	25-31, 33, 36	26, 37, 38
Rockets.....	29, 60	30, 55
Small arms.....	28, 32	30, 37
 Wire:		
Cutting party.....	56, 60	52, 55
Entanglements.....	11-12, 92	10, 95
High tension.....	8	8
Protective.....	12	13