LIGHT TRENCH MORTAR

DRILL REGULATIONS

(L. T. M. D. R.)

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The following pamphlet, entitled "Light Trench Mortar Drill Regulations," is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

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(L. T. M. D. R.)

NOTE.—Materiel described and range tables shown are for mortars and ammunition used by A. E. F. prior to December, 1917. See Ordnance Pamphlet No. 1744 for U. S. Mortars and ammunition and range tables for same.

CHAPTER I.

1. School of the Soldier as prescribed in Infantry Drill Regulations.

SCHOOL OF THE SQUAD

2. The squad consists of one corporal and four or five privates, the corporal being the squad leader. A substitute squad leader is designated in each squad, who takes the place of the corporal when the corporal is absent. When both the corporal and the substitute are absent, the private senior in length of service acts as squad leader.

3. The formation of one squad in line is in single rank, numbers 1, 2, 3, 4, from right to left, the corporal three paces in front of the center of his squad; extra men, if any, in the line of file closers.

4. When in line in platoon the formation is the same, except that the corporal is in line on the right of his squad.

5. When in column of squads the post of the corporal is 40 inches in front of the center of his squad.

6. The squad executes the *halt, rests, facings, steps,* and *marchings* as explained in the School of the Soldier, Infantry Drill Regulations.

7. School of the Squad as prescribed in Infantry Drill Regulations, with the following substitutions.

To Follow the Corporal

8. Being assembled or deployed, to march the squad without unnecessary commands, the corporal places himself in front of it and commands: FOLLOW ME.

The corporal moves in any direction.

The men of the squad oblique toward and follow the corporal in order, 1, 2, 3, 4, in single file, at easy marching distance.

To Deploy as Skirmishers

9. Being in any formation:

1. *As Skirmishers*, 2. MARCH.

The corporal places himself in front of the squad, if not already there. Moving at a run, the men place themselves in line, three paces in rear of the corporal, at two pace intervals, so that the center of the squad will be directly in rear of the corporal, numbers 1 and 2 to the right, 3 and 4 to the left of his center.

When deployed as skirmishers the men march "at ease."

SCHOOL OF THE PLATOON

ORGANIZATION

10. The Sappers and Bombers Platoon consists of:

1 First Lieut.—Platoon Commander.
1 Second Lieut.—Second in command.

2 Total commissioned.

BOMBERS (3 in. Trench Mortars).

3 Sergeants—Section commanders.
6 Corporals—Gun squad commanders.
30 Privates: 1st Class and privates—six gun squads of 5 men each.

39 Total enlisted.

SAPPERS:

1 Corporal.
8 Privates.

9 Total enlisted.

11. The platoon is organized into six gun squads of one corporal and five men each, there being one extra private in each squad to replace absentees, sick, wounded, etc.

In the formation of the platoon line, the squads are in line abreast of each other with two paces interval between squads.

12. The six gun squads are organized into three sections of two gun squads each, each section commanded by a sergeant.

13. The guns should work in pairs (sections), the guns of each pair being kept close enough together to be in constant communication with each other.

14. The sappers (1 corporal and 8 privates) constitute the sapper section of the platoon.

15. For close disciplinary drill, the sapper section forms as the seventh and eighth squads of the platoon; extra men form in the line of file closers two paces in rear of the rank, each in rear of his own squad; the senior sergeant acts as first sergeant; the other two sergeants act as right and left guides.

In combat drill, the corporal of the sapper section reports to the platoon commander for orders.

The second lieutenant assists the platoon commander and takes his place if he is absent or incapacitated.

16. The platoon executes the *halt, rests, facings, steps, marchings, takes distances, assembles, resumes attention, obliques, resumes the direct march, preserves alignments,* as explained in the Schools of the Soldier and the Squad, in Infantry Drill Regulations, substituting in the commands "platoon" for "squad."

17. The platoon executes the close order movements prescribed in Infantry Drill Regulations for the company, substituting the word "platoon" for "company," and the word "section" for "platoon," with the following additions and substitutions:

18. Being in line of squad columns or section columns, to turn the platoon:

1. *Platoon right* (*left*), 2. MARCH, 3. *Platoon,* 4. HALT.

At the first command, the leader of the right unit commands: *Column Right.* The leaders of the other units command: *Column Half Right.*

At the second command, the units execute the movements according to the preparatory commands of their leaders.

The leaders of the units, except the right, lead their units to the new line, giving the command, *Column Half Right,* MARCH, at such point as they will have their proper interval from the unit on their right.

At the command "Platoon," the leader of the right unit commands: "Squad (section)." At the command, "HALT," the right unit halts. The other units are halted by their leaders so as to be abreast of the right unit on the new line.

19. If the command: "Double Time," be given, the right unit continues to march at quick time. The other units are marched at double time until abreast of the right unit, when the leaders command: *Quick Time,* MARCH.

20. Being in line or skirmish line: 1. *Squad columns,* 2. *Forward* (*Rear*), 3. MARCH.

The squad leader moves straight to the front (rear); the members of each squad face toward and follow the squad leader, in single file, in order 1, 2, 3, 4, at easy marching distance.

21. Being in line or skirmish line: 1. *Section columns,* 2. *Forward* (*Rear*), 3. MARCH.

The section leaders repeat the preparatory command and, at the command, "MARCH," dart through the center of their sections; the squad leaders close in rear of section leader, the squads following their squad leaders, each squad in single file, numbers 1, 2, 3, 4, in order from front to rear.

Each section leader thus conducts the march of his section in double column of files.

If to the rear, the section leaders, instead of darting through, face to the rear, the squads following, as described.

22. Squad or selection columns may be formed from column of squads or sections, by similar commands and in a similar manner as skirmish line is formed, substituting in the commands, *"Platoon Columns,"* or *"Squad Columns,"* for *"As Skirmishers."*

23. To deploy section or squad columns: 1. *As skirmishers,* 2. MARCH.

Nos. 2, 3, and 4 move to the left front and place themselves on the line with No. 1 at the proper interval.

The squad leader takes his post three paces in front of the center of his squad.

24. Being in squad columns, to form column of files and change direction: 1. *Squads, Column Right (left),* 2. MARCH.

25. Being in Section Columns, to form double column of files, and change direction: 1. *Sections, Column Right (left),* 2. MARCH.

26. On arrival at the storehouse or place where the guns and ammunition are kept, the platoon commander commands: 1. *Secure equipment,* 2. *Fall out.*

At this command the platoon falls out and each man obtains the following equipment:

Corporal: Base plate, shovel and gunners' pouch containing a clinometer, wrench, tommy bar, spare striker with nuts, bolts and washers, two aiming sticks ten inches long, a plumb line, a prismatic compass, and a circular protractor. The gunners' pouch is carried on the left side with strap over the right shoulder.

No. 1. The gun barrel.
No. 2. Elevating stand and cleaning rod.
No. 3. Ammunition jacket.
No. 4. Ammunition jacket.

The ammunition may be carried in boxes, sand bags, or otherwise, as ordered.

The squads fall in again as before, the equipment of each man being placed on the ground in front of him in a uniform manner throughout the platoon.

27. To take up loads: 1. *Take,* 2. LOADS.

Each man takes up his load.

General Rule.—At all preparatory commands for marching, if loads are grounded and the command "Take Loads" be not given, loads are taken up at such preparatory command.

28. To ground loads: 1. *Ground,* 2. LOADS.

Each man places his load on the ground in front of him gently and in the uniform manner prescribed.

General Rule.—At all commands for halting, loads are grounded without command, upon completion of the halt.

PREPARE FOR ACTION

29. At this command the corporal examines the contents of his gunners' pouch, checks up its contents and makes certain that the clinometer is serviceable, after which he supervises the work of the rest of his squad.

Nos. 1 and 2 connect the elevating stand to the barrel and place the gun in position one (1) pace in front of the corporal, muzzle of gun to the front. The traversing screw should be central.

No. 1 sponges out the barrel and replaces muzzle cover.

No. 1, assisted by No. 2, examines the elevating and traversing gears, removes the base cap and inspects striker, being careful to see that it is screwed tightly in base cap and is clean, after which the base cap is replaced on the barrel.

Nos. 3 and 4 look to their ammunition.

After the examination is completed the squad takes post as follows:

Corporal on left of gun in line with and facing the base plate.

No. 1 on right of gun in line with and facing muzzle.

No. 2, on left of No. 1 in line with and facing the base plate.

Nos. 3 and 4 at the ammunition store which, for drill purposes, is considered as 5 paces in rear of base plate, facing the front.

The corporal then reports "No. ( ) CORRECT" or otherwise, stating deficiencies.

ACTION

30. At this command, the corporals run at double time out to their platoon commander and receive instructions as to target, method of fire, range, charge, fuze, etc. Details will be taken down in a note book and will be repeated back to the officer giving the instructions. Each corporal, on returning to his post, will communicate his instructions to his squad and then duties will be carried out as follows:

The corporal aligns the base plate on the target by raising the base plate on its edge and sighting over the upper edge and moving the base plate till it is accurately aligned on the target. The corporal then marks where the lower edge of the base plate rests on the ground. This line should point directly toward the target. The base plate is then turned bottom side up by No. 2 and placed on the ground with one edge parallel to and touching the line on the ground. No. 2 then stands on the base plate to hold it firmly, while No. 1 marks around the four edges of it with a pick or shovel. The base plate is then removed and the pit is dug by No. 1 within the lines thus marked out on the ground. The pit when dug will then hold the base plate perpendicular to the target. The pit should be V shaped with the rear wall inclined at an angle of 45°. The top of the base plate should be level with the surface of the ground. The pit being dug, No. 2 puts the base plate in the pit with the rope handle upwards. It should be in firm contact with the earth so as to prevent it shifting when the gun is fired. The gun and elevating stand are then placed in position with the base cap in the central depression of the base plate.

No. 2, then squatting on his haunches in front of the elevating stand, his hands grasping the legs of the elevating stand, moves it to right or left as ordered by No. 1, who aligns the gun on the target. The final adjustment for direction may be made by turning the traversing screw; two complete turns of the handle being equal to one degree of deflection. The legs of the elevating stand should always be as nearly as possible at right angles to the barrel, as this allows the shock to be taken by the base plate and not by the elevating stand. Sandbags may be placed on each foot of the elevating stand with advantage, but they should not rest on the cross stays.

The barrel should be inclined at an angle of about 45°, and about one inch of the elevating screw should be seen above the brass cap of the elevating gear.

The corporal places the clinometer on the barrel and elevates or depresses as required.

Sandbags placed underneath and on top of the base of the barrel will steady it and aid accurate shooting.

No. 4 cleans shell, inserts cartridge in cartridge container and places the ballistite rings on cartridge container if ordered.

No. 3 inserts detonator and screws on the "always fuze," straightens the pin and carries up the ammunition to No. 2.

No. 2 withdraws the safety pin before handing shell to No. 1.

When a certain number of rounds is ordered to be fired, Corporal will not report his gun *ready* until the prescribed number of rounds has been prepared and placed near No. 2. In case of gun fire, in addition to the above preparation, the safety pins will be withdrawn by No. 2 from the number of rounds ordered, prior to the corporal reporting his gun *"ready."*

31. PREPARE ( ) ROUNDS { Platoon / Section / Gun } FIRE.

At this command, the corporals repeat the command back to the platoon commander.

No. 1 removes the muzzle cover.

No. 3 hands shell to No. 2, who removes safety pin and hands shell to No. 1.

No. 1, holding the upper guide with the right hand, palm up, and body of the shell with the left hand, palm down, inserts the base of the shell in the bore of the gun. When this is done, the corporals report in succession from right, "No. ( ) READY."

32. COMMENCE FIRING.

At this command, No. 1 allows the shell to drop into the gun cutting his hand sharply away. The corporal then reports "No. ( ) FIRED," and, placing the clinometer on the barrel, readjusts the elevation.

NOTE.—In case of gun fire the corporal will report on completi of the number of rounds ordered. The elevation should, howev be checked as often as practicable (if possible, after every four or five rounds).

33. CEASE FIRING.

No. 1 sponges out the gun and replaces the muzzle cover.

34. Methods of Fire.

Platoon Fire.—The guns are fired, with or without an interval, as ordered, in succession throughout the platoon, commencing with No. 1 gun.

EXAMPLE: *"Platoon Fire.* —(10) second interval—COMMENCE FIRING."

Section Fire.—The guns of each section are fired with or without intervals, as ordered, without reference to the other sections.

EXAMPLE: *"Section Fire.* —(10) second interval—COMMENCE FIRING."

Gun Fire.—The guns are fired with or without an interval, as ordered, each gun independently. If no interval be ordered each gun is fired as rapidly as possible.

EXAMPLE: *"Gun Fire.* —(10) second interval—COMMENCE FIRING."

The number of rounds ordered having been fired, the corporal reports: "No. ( ) FIRED."

35. Being in action, at the command:

PREPARE TO ADVANCE (WITHDRAW).

The gun is dismounted from the elevating stand and the squad falls in, facing the front or rear as prescribed for the command "FALL IN." Loads are taken up.

36. Corrections.

All orders for corrections will be repeated by the corporal who then makes the necessary alterations and reports: "No. ( ) GUN CORRECTED."

37. Missfire.

Corporal reports: "No. ( ) MISSFIRE," and orders No. 2 to raise the base of the barrel to a sufficient height to permit the shell to slide down. When the shell begins to slide (but not before), No. 1 places his hand in the muzzle and grasps the "always fuze," withdraws the shell, unscrews the "always fuze," and passes them back to No. 4, who will remove the detonator and readjust the "always fuze." No. 2, after the shell has been removed, raises the base of the barrel to the full extent, tapping the base cap to remove any matter left behind.

Missfires may be caused by:

(*a*) Bad cartridge.

(*b*) Loose striker.

(*c*) Dirty guides of the shell.

(*d*) Dirty bore (too thick oil in the bore will cause missfires).

(*e*) Unconsumed portions of cloth from ballistite rings covering nipple of striker.

If, on examination, the cap of the cartridge has been well and centrally struck by the striker, remove the cartridge from the

cartridge container and insert a new one. If the cap is not centrally struck, the fault is due to:

(*a*) Loose striker.

(*b*) Bent or crooked cartridge container.

38. SUSPEND FIRING.

At this command, the mortar will not be loaded or fired again until command: COMMENCE FIRING, is given.

39. Moving the Gun.

Before moving the gun from one position to another the elevating screw will be run down to its lowest extent.

1. *Change Posts,* 2. MARCH (*in action*).

At the command: "*Change Posts,*" the corporal removes pouch, places it on the ground. At the command: "MARCH" he takes No. 4's place.

No. 4 takes No. 3's place.

No. 3 takes No. 2's place.

No. 2 takes No. 1's place.

No. 1 takes the corporal's place.

This movement is executed at the double time.

40. On completion of the drill, Platoon Commander gives the command.

1. *Replace equipment,* 2. FALL OUT.

The equipment is replaced in store house or wherever it is kept, and at the command: "FALL IN," the platoon falls in as prescribed.

41. Ammunition Jackets.

Four (4) per gun are provided to carry 4 shells each. The jackets are put on over the head and the tapes tied over the jacket in front of the body after shells are in the pockets.

42. Loading.

The retaining pin of the "always fuze" or the lever of the "pistol head" fuze should always be downward when inserting the shell in the bore.

43. Firing.

Before firing, make sure that all oil is removed from the bore. If the bore is oily, smoke will be given off and the position disclosed.

44. After Firing.

Examine, clean and oil all working parts. Examine striker. Clean and slightly oil bore and remove all residue from chamber. Clean base plate.

Occasionally go over nuts and screws with wrench. To clean the bore of the mortar, insert the base of the mortar, with the base cap removed, in a bucket of boiling water and then insert cleaning rod in bore and move it up and down until bore is thoroughly cleaned.

The strap and saddle frequently become loose thus permitting the gun to slip forward during firing. If tightening the two strap nuts does not prevent this, it will be necessary to loosen the strap nuts and then place a piece of tin between the strap and the barrel, after which the strap nuts should again be tightened up.

The cross stays are arranged to spring just past the dead center in such a manner as to hold the two legs rigidly apart. There is an adjustable lug on one of the cross-stays to take up any wear which may occur on the set pins. If the barrel is not supported rigidly by elevating stand, tightening the adjustable lug may correct it.

45. Muzzle Cover.

The muzzle cover should always be placed on the muzzle of the mortar when firing is not in actual progress. In wet weather this is of special importance as water in the bore seriously affects the range.

46. There should be frequent drills with the respirators on, to accustom the men to handling the gun when so equipped.

CHAPTER II.

DESCRIPTION OF MATERIEL

STOKES TRENCH MORTAR (3 INCH)

47. The three inch Stokes Trench Mortar consists of three parts: the Base Plate, Barrel, and the Elevating Stand.

(1) The *Base Plate* is made of compressed steel and weighs 29 lbs. In the center of the base plate there are three depressions for rapid traversing, each giving the following deflections, irrespective of the range:

Yellow cartridge	24	yards
Green cartridge	32	—
Green cartridge with one ring	48	—
Green cartridge with two rings	90	—
Green cartridge with three rings	102	—
Blue cartridge	25	—
Blue cartridge with one ring	40	—
Blue cartridge with two rings	75	—
Blue cartridge with three rings	90	—
Blue cartridge with four rings	109	—

Underneath the depressions there is a small ledge or shelf to assist the piece on the shock of discharge. There are five (5) indentations or ribs in the base plate to give it extra strength.

(2) *Barrel.*—The barrel is made of drawn steel. It is 51 inches long and weighs 48 lbs. It is closed at one end by a base cap into which is screwed a striker with a central fire nipple. Running up the center is a white line for sighting purposes. About 9 inches from the muzzle is the collar in two parts. The upper part, called the strap, is made of steel and has a slot on top to receive the tail of a periscope. The lower part is called the saddle and is made of bronze or gun metal. It has a projecting lug which engages the traversing screw. The muzzle is slightly beveled to permit of easy insertion of the shell.

(3) *Elevating Stand.*—The elevating stand is made of tubular steel and consists of two legs attached to a center trunnion by means of a compass joint; these legs are held apart by a cross stay which is arranged to spring just past the dead center in such a manner as to hold the two legs rigidly apart. There is an adjustable lug on the cross stay to take up any wear which may occur on the set pins. The trunnion standard is fitted with a bevel gear operated by a steel handle by means of which the elevating screw can be rapidly raised or lowered. The top end of the elevating screw is fitted with a cast steel yoke which forms part of the traversing screw. There are 2 slots in this yoke into which fits the traversing screw. The traversing handle, which forms a bolt, passes through the yoke of the traversing screw

and is held in position by a linch pin. A dog clutch on this bolt engages with the screw and forms a means of traversing the barrel.

The barrel can be quickly disconnected from the mounting by first lifting the linch pin and withdrawing the traversing bolt. The barrel can then be freely lifted out of position for carrying purposes. The bolt should be put back in position and held there by the linch pin. The weight of the elevating stand is 32 lbs.

One turn of the Traversing Handle will give the following deflection in yards irrespective of the range when using a

Yellow cartridge	1½ yards
Green cartridge	2 —
Green cartridge with one ring	3 —
Green cartridge with two rings	5½ —
Blue cartridge	2 —
Blue cartridge with one ring	2½ —
Blue cartridge with two rings	3½ —
Blue cartridge with three rings	5 —
Blue cartridge with four rings	6 —

THE TRENCH MORTAR SHELL

48. The shell varies in weight but will average about 10 lbs. 11 oz. It is cylindrical in shape with a body made of cast steel painted a field gray or khaki. There are two distinctive bands painted on each shell. A red band denotes a high explosive. A green band denotes the shell is loaded with ammatol, while a pink band denotes ammonal. The weight of the charge is 2¼ lbs. The inside of the shell is thickly varnished to keep the explosive dry. On each end of the body of the shell is a lathe-turned steel guide, made of very soft steel. Screwed or welded on to the bottom guide is the cartridge container, fitted with 16 gas escape holes. The top guide is fitted with a nipple screw and forms the entrance to the detonator well, a copper tube 8 inches long.

49. There are two types of fuze, a time fuze, called the "Pistol Head," and a percussion fuze, called the "Always."

Pistol Head.—This is an iron casting with two channels. The long one contains a striker and a strong steel spring. The short one contains a brass plunger and a copper creep spring. On the outside is the flyoff lever, one end of which is engaged in the neck of the striker, the other is held in position by the plunger. There are two safety pins, one passing through the long channel and underneath the striker, the other passing through the plunger action. Before firing the pins are withdrawn. On shock of discharge, the plunger falls down, overcoming the creep spring, thus releasing lever against side of barrel only. When shell leaves the muzzle, the lever drops clear, allowing the spring to expand, forcing the striker on the percussion cap, igniting the fuze, exploding detonator and detonating the main charge.

Detonator.—No. 8 Commercial, containing 30 grains fulminate of mercury.

Fuze.—Bickford's Slow Burning, 12½ and 14 sec. lengths. Marked with dots and lines. Dots=½ second. Lines = — seconds. On one end is an Eley 410 percussion cap, in the side of which are four small gas escape holes, through which the gas escapes through the hole in pistol head.

The 146 or "Always," consists of a hollow steel cylinder closed at the top by a screw fuze top, concave on the inside. Inside are two pellets. The bottom one, made of brass, contains a central fire percussion cap. Two creep springs are grooved on top of the pellet and a small powder magazine is underneath, with small gas escape holes on one side. The top pellet is made of aluminum and is concave on top. It contains the striker and also has a small gas escape hole on one side. Resting between the two concave surfaces is a steel ball. Fitting over the outside is a brass sleeve with an ejector spring. Fitting over the spring and close to the sleeve is a small brass platform. Wound around the outside is a waterproof tape with spring, on one end of which is a safety bolt which passes through the platform sleeve and body and rests between the two pellets. The tip is held secure by a retaining pin which engages in the frame of the platform. As further safety precaution, a small split pin passes through the retaining pin.

Cartridge.—Propelling charge: ballistite in Eley 12 bore cartridge.

Yellow cartridge contains 95 grains. Range 100 yds. to 220 yds.
Green cartridge contains 120 grains. Range 116 yds. to 290 yds.
Ring contains 100 grains.
Green and 1 ring: 230 yds to 497 yds.
Green and 2 rings: 287 yds. to 606 yds.
Green and 3 rings: 340 yds. to 753 yds.
The red cartridge, 175 grains, is no longer used.
Blue cartridge contains 95 grains ballistite, reinforced with 5 grains gun cotton yarn.
Blue rings contain 110 grains of 3 mm. flake cordite.
Blue cartridge: 102 yds. to 240 yds.
Blue and 1 ring: 197 yds to 420 yds.
Blue and 2 rings: 259 yds. to 550 yds.
Blue and 3 rings: 320 yds. to 660 yds.
Blue and 4 rings: 364 yds. to 800 yds.

CHAPTER III.

RANGE TABLE FOR 3-INCH STOKES MORTAR WITH YELLOW CARTRIDGE

50. PROJECTILE, WEIGHT, 10 lbs. 11 oz.
CHARGE, CARTRIDGE, YELLOW, SERVICE, 95 grs. Ballistite.
RINGS, 100 grs. Ballistite.

YELLOW CARTRIDGE	TIME OF FLIGHT	DEGREES
Yards		
220	7.0	45
210	7.6	50
190	8.2	55
170	8.7	60
140	9.2	65
100	9.6	70

YELLOW cartridge one ring	TIME of flight	YELLOW cartridge two rings	TIME of flight	YELLOW cartridge three rings	TIME of flight	DEGREES
245	13.5	340	15.8	480	18	69
258	12.5	374	15.4	520	17.5	67
290	12	406	15	555	17	65
318	11.5	440	14.5	590	16.5	63
340	11	480	13.8	625	16	61
365	10.5	515	13.3	660	15.5	58.5
390	10	540	12.9	695	15	54.5
410	9.5	574	12.4	730	14	48

Note.—See Ordnance Pamphlet No. 1744.

RANGE TABLE FOR 3-INCH STOKES MORTAR WITH GREEN CARTRIDGE

51. CHARGE, CARTRIDGE, GREEN SERVICE, 120 grs. Ballistite. RINGS, 100 grs. Sporting Ballistite.

ELEVATION	NO RINGS		1 RING		2 RINGS		3 RINGS	
	Range	Time of flight	Range	Time of flight	Range	Time of flight	Range	Time of flight
Degs.	Yds.	Secs.	Yds.	Secs.	Yds.	Secs.	Yds.	Secs.
45	290	7.5	497	10.3	666	12.6	753	14.0
50	280	8.1	487	11.7	646	13.6	736	15.1
55	261	8.7	460	12.4	608	14.5	696	16.1
57.5	249	8.9	442	12.8.	581	14.9	669	16.6
60	235	9.2	420	13.1	550	15.3	636	17.0
61	228	9.3	411	13.3	537	15.5	621	17.2
62	222	9.4	401	13.4	523	15.6	606	17.3
63	215	9.5	390	13.5	508	15.7	590	17.5
64	208	9.5	379	13.6	492	15.9	573	17.6
65	201	9.6	367	13.7	476	16.0	556	17.8
66	193	9.7	355	13.8	460	16.1	538	17.9
67	186	9.8	343	13.9	433	16.2	519	18.0
68	178	9.8	330	14.0	425	16.3	499	18.2
69	170	9.9	317	14.1	407	16.5	479	18.3
70	161	10.0	303	14.2	388	16.6	459	18.4
71	153	10.0	289	14.3	369	16.7	438	18.5
72	144	10.1	275	14.4	349	16.8	416	18.6
73	135	10.1	260	14.4	329	16.8	394	18.7
74	126	10.2	245	14.5	308	16.9	371	18.8
75	116	10.2	230	14.5	287	17.0	348	18.9

When using the Bickford fuze, which may be 14 seconds or only 12.5, it will be seen that a combination of both Yellow and Green cartridges with rings will be necessary to obtain all the ranges up to 600 yards.

The following is suggested when using the Pistol Head.

Range 260—410 Yellow cartridge and one ring.
375—475 Green cartridge and one ring.
470—575 Yellow cartridge and two rings.
550—600 Green cartridge and two rings.

14 seconds fuze should be used for the last two.

RANGE TABLE FOR 3-INCH STOKES MORTAR WITH BLUE CARTRIDGE AND BLUE RINGS

CHARGES { CARTRIDGE, 95 grains ballistite, reinforced with 5 grains, gun cotton yarn.
RINGS, 110 grains, 3 mm. flake cordite.

ELEVATION	Cartridge only		1 RING		2 RINGS		3 RINGS		4 RINGS	
	Range	Time of flight	Range	Time of flight	Range	Time of flight	Range	Time of flight	Range	Time of flight
Degs.	Yds.	Secs.	Yds.	Secs.	Yds.	Secs.	Yds.	Secs.	Yds.	Secs.
45	240	7.1	420	9.6	550	11.6	660	13.2	800	15.0
50	233	7.6	411	10.4	538	12.5	649	14.3	780	16.2
52	228	7.8	404	10.7	530	12.9	639	14.7	767	16.6
54	222	8.0	395	10.9	518	13.2	626	15.1	748	17.0
56	215	8.2	384	11.2	503	13.5	608	15.4	726	17.4
58	207	8.4	371	11.4	486	13.8	589	15.8	701	17.8
60	197	8.5	357	11.7	467	14.1	567	16.1	672	18.2
61	193	8.6	349	11.8	457	14.3	554	16.3	656	18.4
62	187	8.7	340	11.9	445	14.4	542	16.4	639	18.5
63	182	8.8	332	12.0	434	14.5	528	16.6	623	18.7
64	176	8.8	323	12.1	422	14.6	514	16.7	605	18.8
65	170	8.9	313	12.2	409	14.8	499	16.9	586	19.0
66	164	9.0	303	12.3	396	14.9	483	17.0	567	19.1
67	158	9.0	292	12.4	383	15.0	468	17.1	547	19.2
68	152	9.1	281	12.5	369	15.1	451	17.2	526	19.4
69	145	9.2	270	12.5	354	15.2	434	17.4	505	19.5
70	138	9.2	259	12.6	339	15.3	416	17.5	483	19.6
71	131	9.2	247	12.7	324	15.4	398	17.6	460	19.7
72	124	9.3	235	12.8	308	15.5	379	17.7	437	19.8
73	117	9.3	223	12.9	292	15.5	360	17.8	413	19.9
74	109	9.4	210	12.9	275	15.6	340	17.9	389	20.0
75	102	9.4	197	13.0	259	15.7	320	18.0	364	20.1

If it is essential to get a 700 yard range, this can be done by firing at 45 degrees elevation, with Green cartridge and three rings.

The short ranges, with 1, 2 or 3 rings, should be avoided as far as possible, as the shell goes so high that it is affected much more by weather conditions and is not accurate.

Wind affects the range, when using rings, very considerably. A high wind behind the shell increases the range and shortens

the time of flight, enabling ranges to be obtained, which otherwise would be impossible. A wind blowing against the shell has the converse effect.

LAYING THE MORTAR IN DIRECTION BY THE USE OF THE AIMING STICKS

52. With the aid of the periscope the corporal directs No. 1 to plant two aiming sticks in the parapet in line with the target. The one nearest the target should be planted first. The sticks should be separated by a distance of from one to two feet and should be firmly driven in the ground in order to prevent any shift in their position. Care should be exercised that these two sticks are planted in such a manner that the target and the two sticks lie on the same straight line, and that the prolongation of this line passes through the position to be occupied by the mortar.

PREPARATION OF THE RANGE CARD

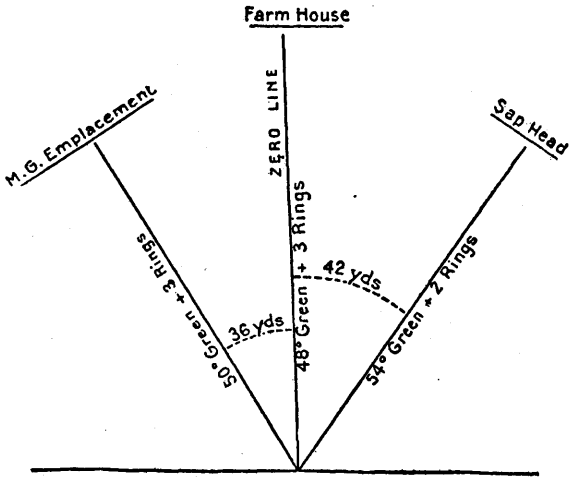
The mortar being in position, *and having registered on the target,* the aiming sticks are altered, if this is found necessary, until the prolongation of the white aiming line on the mortar passes through the two aiming sticks and intersects the most important target in the sector allotted to the trench mortar. The two aiming sticks then determine the zero line of the range card. Mark the position of the mortar by a small circle at the bottom edge of range card. Draw a line from the mortar position to the principal target, as indicated by the aiming sticks, and label this line the zero line. Having already registered on this target, mark, on zero line, the elevation and cartridge used. For other targets in the sector, register on them in turn, and from each position of the mortar when registered return it to the zero line, counting the turns of the traversing handle or the movements of the base cap in the base plate traversing and convert these changes into yards. On the range card, draw lines from the mortar position in the direction of the various targets, labeling them by their target designations, and mark along these lines the elevation in degrees and the cartridge used. In the angle between these lines and the zero line write the number of yards of traverse. When completed, the range card should be *inclosed* (for want of something better) in a picture frame with a glass face, which can be purchased for a few cents at a store near the billets. The glass face on the picture frame will prevent the destruction of the range card when using it in the rain.

USE OF RANGE CARD

53. Align mortar on zero line, with the aid of the aiming sticks planted in the wall of the parapet.

The mortar being in this position, the firing data can be taken at once from the range card.

Thus, with a range card, the mortar *can be* prepared for firing as accurately by night as by day.



Point from which made out.....

Made by..... *Date*.....

Notes.....

.....

LAYING THE MORTAR IN DIRECTION BY COMPASS

54. 1. Locate on the map accurately the gun position of the mortar.

2. Locate on the map accurately the exact position of the target. If the target is a linear one, take the central point of the target as the objective.

3. Draw a line on the map from the gun position to the target.

4. Place the center of the protractor on the gun position on the map and read the numbers of degrees from the north to the target.

5. Correct for the local magnetic variation of the needle.

6. Drive in one of the aiming sticks at the gun position and place the compass on top of it. Rotate the compass till the card reads the required magnetic bearing and drive in the other stake on the wall of the parapet, it having the magnetic bearing of the target. The two aiming sticks then determine a line to the objective, from the mortar position. Align the mortar on the two aiming sticks by holding the plumb bob and line over the rear stake and bringing the white line on the mortar in line with the front stake and line of the plumb bob.

This method will be the only method available in the event of an advance where the mortars will be required to go into action within the enemy's former lines and to open fire without

delay on a target which an inspection of the map will show to be invisible from the position selected for the mortars. The necessary firing data can be computed prior to the advance and if accurately performed there will be no delay in opening fire. This method is valuable also in night firing on an unregistered target, and by daylight where the target cannot be seen from our lines, but can be located on the trench map.

55. Method of Testing the Compass.

The compass used by the trench mortar detachments must be a good instrument, prismatic or equivalent thereto. Even good compasses are liable to have an error. The direction of the magnetic north indicated by the compass needle may not be the actual magnetic north, but this error is of no account if it be a constant error in the compass reading and if its magnitude and sign be known.

To test the compass, proceed as follows:

From an accurate map select two points, both easily determinable on the ground and reasonably far apart. Join these points on the map by a straight line and, by knowing the local magnetic variation, determine the magnetic bearing of this line on the map with the protractor. Proceed to the ground and read several times the bearing indicated by the compass from one of these objects to the other. The means of these readings should agree with the magnetic bearing of the line determined from the map. If it does not, the difference between them is the constant error of the compass which will therefore read too much or too little as the case may be.

EXAMPLE.—From map, bearing of church from crossroads equals—84 degrees;

By means of compass readings, bearing of church from crossroads—85 degrees.

Compass error—1 degree too great.

The compass is commonly used by the trench mortar squads, either for resection or for laying in direction, and a knowledge of the error of the compass when performing these duties can be conveniently applied in either one of the two following ways:

1. Convert the bearings given by the compass into the true magnetic bearings (by adding or subtracting the error) and work from the magnetic N and S lines on the map.

2. Alter the local magnetic variation shown on the map by the plus or minus error of the compass. A local magnetic variation is thus obtained, suited only for work with the particular compass whose error has been determined; consider all bearings taken by this compass as being correct magnetic bearings; convert these bearings to true North bearings by use of the altered magnetic variations; work from the true N and S lines on the map.

The compass should not be used when the instrument is close to steel or iron. It should therefore not be used in the vicinity of the mortar or ammunition, and the user should not have metal on his person such as a revolver.

It is impossible to say what distance the mortar and ammunition should be removed from the position of the compass, but a distance of several yards should be sufficient.

56. Resection.

Resection is a method of locating accurately on the map the position of any point chosen on the ground.

Resection is *useless* and *unnecessary* in the following cases:

1. When the map is inaccurate.

2. When the map is accurate in detail and the position to be located is near any object which it is possible to identify both on the map and the ground.

3. When the map has the trench system marked accurately thereon.

Resection *is* necessary in the following case:

When the map is accurate in detail, but the position to be located is not near any object which can be identified both on the map and the ground.

57. To Locate a Point by Resection.

(*a*) Select three prominent points on the landscape, marked on the map, and roughly 120 degrees apart, if possible.

(*b*) Determine the magnetic bearing of these points and draw lines through them, backward until they intersect.

(*c*) These lines (if the map and compass be accurate) will intersect in one point, which is the position required.

CHAPTER IV.

DISK SIGNALLING

58. In working with bombers, a rapid and very simple method of signal communication is required. One of the best signal codes that has been tried is on the following lines:

1. The observer to carry a small circular metal disk about 1.5 feet in diameter, attached to a pole about 4 feet long. The disk is to be painted with red and green quarterings on one face and black and white on the other. The disk can be made of wood and canvas.

SIGNALS TO BE AS FOLLOWS

59. Range: Signals for range will be given with the disk raised above the head, red and green quarterings toward the reader.

Increase range 10 yards: Lowered once to the right.

Range correct: Disk held in the vertical position for a few seconds.

Line: Signals for direction will be given with the disk raised above the head with black and white quarterings toward the reader.

Right or left 10 yards: Lowered once to the right or left.

Line correct: Disk held in the vertical position for a few seconds.

60. To stop the fire: Disk raised in a vertical position, red and green toward the reader and waved rapidly from side to side.

To inform infantry commander that the fire has lifted or stopped: Disk raised in the vertical position, with black and white quarterings toward the infantry commander and waved rapidly from side to side.

61. In using these last signals, since several shells will be in the air, a few seconds should be allowed, after giving the signal to the platoon, before giving the signal to the infantry commander, if our infantry are to rush the trench.

NIGHT SIGNALS

62. At night, disks painted with luminous paint may be used or torches with red and white lights, a tube 12 inches in length supplied to go over the torches to shade the flash.

Red.—One dash=Lengthen 10 yards.

Dash dot dash=Range correct.

A series of dots=Stop firing (to mortars).

White.—One dash=Right 10 yards.

Dot dash=Left 10 yards.

Dash dot dash=Line correct.

A series of dots=Fire has been stopped.

Buzzer and Shutter Signals

63. The following signals should indicate the corrections to be made, not the location of the strike of the shell.

All signal corrections for laying the mortar will be made in yards of 10 or some multiple of 10.

Left.—One dot for every 10 yards correction, followed by a dash.

EXAMPLE.—Left 30 yards.

Right.—One dot for every 10 yards correction, followed by two dashes.

EXAMPLE.—Right 20 yards.

Lengthen.—One dash followed by one dot for every 10 yards correction.

EXAMPLE.—Lengthen 30 yards.

Shorten.—Two dashes followed by one dot for every 10 yards correction.

EXAMPLE.—Shorten 20 yards.

Register.—. . . , dot, dash, dot.

Received.—. . . , one dash.

Repeat.—. . . , two dashes.

CHAPTER V.

METHOD OF BRACKETING

64. Estimate the range to the objective. Add 30 yards to the estimate. Lay the mortar at this range and if the shot goes over the target the next shot should be fired with the mortar set at 30 yards under the estimated range. If this shot falls short the target is within a bracket of 60 yards. Halve the bracket until the target is hit. If, in the first place, the mortar was fired at the estimated range it might be very difficult to tell exactly where the shot struck. In some cases it will be necessary to use two observers when firing at a small target, such as a machine gun emplacement where the direction and range are both important. In such a case, place one observer in the front line between the mortar and the objective who would send back information right or left, so many yards, as the case might be. The other observer should be placed on a flank and observe the range, sending back the information to lengthen or shorten so many yards.

EXAMPLE OF REGISTERING

65. Mortars at approximately the same range from the target. Target—line of trench.

No. of Round	No. of Mortar	ELEVATION	OBSERVATION + = over — = short	PLATOON COMMANDER'S ORDERS
		Yards		TARGET—LINE OF TRENCH
1	1	360	—	No. 1 Mortar, Range 360, Cartridge—Fire No. 1.
2	1	400	+	Range 400, Cartridge—Fire No. 1.
3	1	380	—	2 turns Left, Range 380, Cartridge—Fire No. 1.
4	1	400	+	Range 400, Cartridge—Fire No. 1.
5	1	380	—	Range 380, Cartridge—Fire No. 1.
				Platoon. Range 380. Commence.
6	1	390	R	Fire, 20 sec. interval, Cartridge—Firing.
7	2	390	R	
8	3	390	—	No. 3, two turns left.
9	4	390	R	No. 4, three turns right.
10	5	390	+	
11	6	390	R	Register.

NOTES

The first round, which was expected to be over, was found to be short. The platoon commander therefore added 40 yards. The third round gave a bracket of 20 yards, which was verified with rounds four and five.

EXAMPLE OF REGISTERING ON A HOSTILE TRENCH, CLOSE IN FRONT OF OUR OWN INFANTRY

66. Position of platoon, about 200 yards behind our front line.

No. of Round	No. of Mortar	ELEVATION	OBSERVATION + = over — = short	PLATOON COMMANDER'S ORDERS
		Yards		TARGET—LINE OF TRENCH
1	1	260	+	No. 1 Mortar, range 260, Cartridge—Fire No. 1.
2	1	250	+	2 turns right, range 260, Cartridge—Fire No. 1.
3	1	240	+	Range 240, Cartridge—Fire No. 1.
4	1	230	—	Range 230, Cartridge—Fire No. 1.
5	1	240	+	Range 240, Cartridge—Fire No. 1.
6	1	230	+	Range 230, Cartridge—Fire No. 1.
7	1	230	R	Platoon. Commence. Fire 20″ interval Range 230, Cart. Firing.
8	2	230	R	
9	3	230	+	
10	4	230	R	
11	5	230	—	
12	6	230	R	Register.

In the above case it is not advisable to use bracket system on account of the proximity of our own infantry. The Platoon Commander intentionally overestimates the range, and adopts the "creeping" method of ranging.

Chapter VI.

STANDING TRENCH ORDERS

Duties of officer in charge of squads in trenches

67. 1. Put himself in communication with Commanding Officers and state position of his headquarters.

2. Visit all emplacements. Instruct and question each gun-corporal as to his duties.

3. Prepare range cards and ammunition reports for each emplacement, if not already existing, and he will be responsible that the latter are written up before submitting his daily report of expenditure of ammunition.

4. He will also see that the orders detailed below for N. C. O.'s are duly obeyed.

5. He will visit the emplacements twice by day and twice between morning inspection and evening inspection to see that the gun teams are on the alert. He will daily cause corporals of the guns to repeat to him their orders.

NOTE.—Orders for every gun will be posted in each emplacement and be the direct orders of the platoon commander. Any additions or amendments considered necessary by any officer of the unit will be made thereto, bearing his initials to be countersigned daily by the platoon commander or sanction otherwise accorded in writing.

It is believed that the second line, sub-paragraph 5, paragraph 67, should read "twice between evening inspection and morning inspection."

6. He will inform company commanders before he fires so that the former may get their men under cover if necessary. This applies both in retaliation and offensive fire.

Duties of a Sergeant

68. 1. This N. C. O. is immediately responsible to the officer in charge of the line.

2. He will assume the powers of the Platoon Commander when anything unforeseen or extraordinary occurs from the enemy's front, until the officer in charge is able to communicate with him and approve or countermand his action.

3. The officer in charge will be located, if possible, left of the right section and the sergeant, center of the left section, should conditions permit it.

4. He will visit, with the officer in charge, the gun emplacements daily and at intervals by night. His nightly rounds will not be made with the officer unless so directed and normally should consist of two visits.

5. He will immediately bring to the notice of the officer in charge any want of discipline or alertness on the part of the sentries on the guns.

Duties of other N. C. O.'s of guns

69. 1. To see that sentries are posted between evening inspection and morning inspection. Sentries consist of one (*) N. C. O. and three men, constituting one gun team as provided in trenches.

2. That his gun is cleaned by 9 A. M.

3. That all ammunition is cleaned.

4. To daily write up and initial the ammunition report.

5. To report to his nearest officer anything of interest observed by him.

WHEN TAKING OVER FROM A PLATOON

70. Upon receipt of Operation Orders the platoon commander should, the day prior to taking over, visit the platoon commander he is relieving and personally ascertain the following particulars, and satisfy himself that the statements made to him are not in any measure a misrepresentation of existing facts and conditions.

Points in particular to be noted:

(*a*) If the outgoing unit is in possession of any information left behind by previous units holding the line.

(*b*) If the outgoing unit possesses any information or notes that may be of value.

(*c*) If a defense scheme will be handed over.

(*d*) Maps to be handed over:

1. Air photographs.

2. Local trench maps of zone.

3. Trench maps of actual sector to be taken over by brigade.

4. Maps of enemy's trenches.

(*e*) Ammunition to be handed over and ammunition statement demanded.

(*f*) Men's billets to be carefully inspected.

(*g*) Cooking facilities and water supply in trenches and in billets.

(*h*) Method of carrying rations to trenches.

(*i*) Personally accompanying the C. O. around the trenches and note particularly:

1. The maximum and minimum distances between trenches.

2. Check contours of our trenches against trench map.

3. Inspect enemy's front line with aid of periscope, *always* from observation posts and sniper's posts when allowed.

4. Visit all emplacements. Ask for range cards with each emplacement, if any, or otherwise actual sector of enemy's line or post covered.

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* In this connection location or condition of brigade and divisional dumps to be ascertained and inspected. Any irregularities noted here to be mentioned to your own C. O. for rectification.

5. Ask for ammunition card at each gun emplacement and inspect to see if written up.

NOTE.—Range cards and ammunition statements must be kept at each emplacement. The advantages are that they facilitate reliefs, daily inspections by the C. O.'s and officers in charge of the trenches.

6. Inspect ammunition, noting the following points particularly.

(1) That the cartridge is not damp; as it may occur that while the cap end of the cartridge is dry, the wad end may be damp and, necessarily, this will have the effect of the shell dropping very short at times, probably to the disadvantage of the infantry holding the line. The explanation to be offered for this is that the full charge does not simultaneously explode when the cap meets the striker.

(2) That the gas escapes of the cartridge containers are clean.

When Turning Over

See that all you have required when taking over has been done by you.

AMMUNITION REPORT

DATE	NO. ROUNDS	DESCRIPTION	NO. SPARE Cartridges	NO. RINGS	NO. ROUNDS Fired	REMARKS
27/10/17	360	60 cartridges	200	1000	100	5 Rounds unfit for firing salvaged J. M. Lt.
28/10/17	255	Do.	150	800	50	All clean 50 rounds received J. M. Lt.
29/10/17	250	Do.	100	700		All clean J. M. Lt.

CHAPTER VII.

THE USE OF TRENCH MORTARS IN DEFENSE

72. Trench mortars have the following uses:

1. To destroy living targets when the opportunity is presented.
2. To destroy all defensive works and obstacles.
3. To prevent the construction by the enemy of new works.
4. To drive the enemy from small sections of our trenches in which he may have gained a footing.
5. To bombard important points in rear and on the flanks of a section of the enemy's line, thus isolating him while he is dealt with by our infantry.

73. The use of trench mortars in defense will be considered under three headings, (*a*) Holding the Line; (*b*) Offensive defensive action; (*c*) Counter-attacks.

(*a*) *Holding the line:*

Every unit in the line has a defensive scheme. To prepare this scheme, one must study all the maps, aeroplane photographs, enemy's trenches, etc. Then decide on what part of the line needs trench mortar assistance the most. There are always certain points where they are most useful such as salients where the two lines are very close together. The front lines now very frequently consist of shell craters, connected up, forming posts. Trench mortars can protect the intervals between these posts. In selecting sites for the trench mortar emplacements the following points should be considered:

1. Range of the mortar.
2. Cover from enemy's fire and view.
3. Possibilities for observing the fire.
4. Communication
   - (1) Between mortars and observing station;
   - (2) Between mortars and trench garrison.
   - (3) Between different mortars of platoon.
5. Condition of soil as regards drainage.

(1) The *range of the mortar* is between 100 and 750 yards. If the mortar is placed in the front line it may be lost during the enemy's barrage prior to his attack, which is always placed on front line. The best location for a trench mortar is about 200 yards in rear of the front line, for the following reasons: The ammunition supply is easier; it has a greater accuracy of fire, because it can then be fired at or near 45 degrees, which is the most accurate elevation. Also it is in a better position to assist in a counter attack on an enemy who has penetrated our first line trenches.

(2) *Cover from enemy's fire and view:* An ideal position is one in dead ground with a dark background such as a wood. If the mortar is in dead ground it cannot be seen by the enemy and if it has a dark background the light of the shell from the mortar cannot be seen till it is well on its way and thus will not give away the location of the emplacement.

(3) *Observing fire:* Points in our own front line should be noted on trench map, from which the effects of your fire on the enemy's position can be observed. It is important to note these points on the map so that if you get hurried orders to shell a bit of the enemy's trench you will know exactly where to go to observe your fire.

(4) *Communication:* There must be *always* communication between your infantry in the trenches, with your observers and with the sections of your platoon. This is generally accomplished either by buzzer, signals or runners.

(5) *Drainage:* Emplacements should not be selected in places where the pits will fill with water during a heavy rain. That is, they must have a drainage outlet.

(b) *Offensive-defensive action:*

Normally a trench mortar platoon keeps half of its personnel with the gun and half resting in dugouts, one half working during the day and the other half during the night. In selecting trench mortar emplacements avoid main communication trenches, as well as main trench systems, as these are always heavily shelled by the enemy. After having selected emplacements, dig them and prepare cover for men and camouflage. Then give each mortar a definite sector of enemy's line, noting important points within sector. Having allotted sectors and objectives, then register. This is accomplished by actually firing at the target with observers watching fall of shots till exact range is found. After registering, make your range card. When registering, do it inconspicuously so enemy will not know it. Fire one mortar at a time with a long time interval.

In each emplacement there should be standing orders as to what the squad should do in all events that can be foreseen. For example, when the enemy's barrage is on your front lines, your mortars cannot fire. The moment it lifts to the rear then it is time to destroy his attack. In a gas attack always fire on the enemy's front line.

Retaliation: The enemy will empty his front trenches and put his men in deep dugouts and then open fire. If you retaliate it will only be against his empty trenches. It is a better policy to wait and retaliate when he is not ready for it. It is always better to have an organized retaliation, such as, artillery, trench mortars, rifle grenades, etc. Destroy a section of his trenches. Whenever an artillery bombardment of the enemy's trenches takes place, always join in with your trench mortars.

Rate of fire: Lay down the type of fire to be used in each emergency, otherwise all the ammunition may be used up and none on hand when most needed. A general rule, the longer the fire is to be kept up the slower the rate.

Ammunition: There should always be at least 100 rounds of ammunition in each defensive emplacement and 100 rounds per mortar in reserve, 300 to 400 yards in rear of emplacement. When the enemy puts on a heavy bombardment it will be out of the question to get up ammunition while it is on, and whenever you think you may be going to withstand an attack, get all the ammunition up you can lay your hands on and trust to luck that it will not be destroyed during the bombardment. There should be a reserve store for no more than two mortars in one place. Never have a reserve store for a platoon in one place.

Emplacements: There should be several emplacements constructed for each mortar. These, to be used in annoying the enemy, might consist in widening a communication trench or certain places in the front line, but there should be one permanent emplacement constructed into which you go when the enemy puts down on you a great bombardment and from which you will use the mortar in repelling his attack. This emplacement should only be used in the registering and in emergencies. The alternative emplacements are used to annoy enemy, destroy his personnel, and inflict losses upon him.

(c) *Counter attacks and local attacks:*

In raids, whenever possible, the mortars should be used to assist the bombing squads. They should be so placed that they can bring a heavy concentrated and continuous fire on a point previously fixed in the enemy's trench about fifty yards beyond the length to be secured by the bombers.

The position of the mortars may be either in the trench down which the bombing raid is made so as to give enfilade fire or in the trenches opposite to the objective.

The following points should be attended to by trench mortar officers:

1. Careful registration on target before operation takes place.
2. Fire should be opened at the moment of attack and continued until the objective is gained and consolidated.
3. A plentiful supply of ammunition should be at the mortars before the attack commences.

The trench mortar can also be used to fire ahead of bombers as they proceed down the trench, but this method should only be employed when observation is so favorable that the trench mortar officer can make certain that he can follow the movements of the bombers down the trench.

EMERGENCIES

74. Whatever precautions are taken, the circulation of orders among trench mortars will always be difficult, and at times of sudden emergency very precarious. Every member of a trench mortar platoon must be carefully informed of situations likely to arise and, in addition to other situations, must know beforehand exactly what he is going to do, and what action the platoon will take in the following emergencies:

1. Gas attack on the front.
2. Sudden hostile bombardment.
3. Mine explosion.
4. Trenches rushed.

The course to be taken depends in almost every case upon the action of the infantry. A close understanding must be had with the infantry and common action decided upon beforehand.

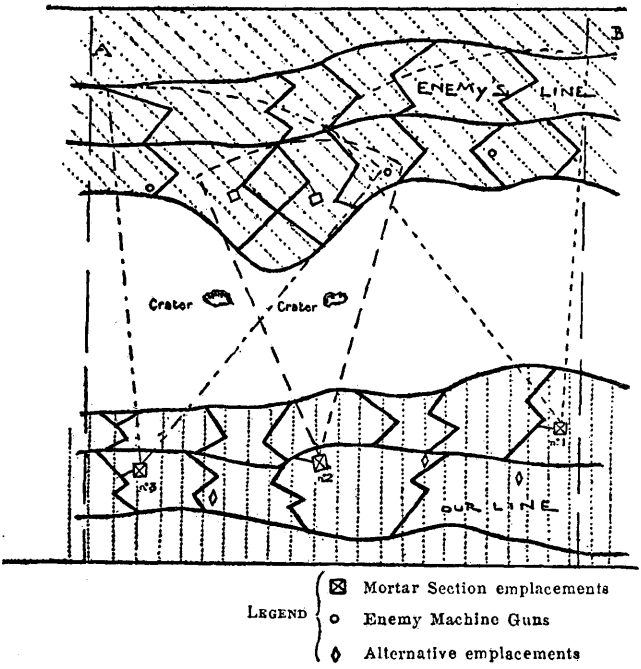
MAPS

75. Every trench mortar platoon commander should keep a map showing:

1. All emplacements with their arcs of fire.
2. All mortars in action, with their night lines.
3. All emplacements in the process of construction.
4. All observing stations, showing exact field of view from each.
5. Ammunition stores, showing routes of supply from each.
6. The Platoon Headquarters.

All maps should be kept up to date and handed over to the relieving units.

TYPE OF TRENCH MORTAR POSITION



NOTES:

The extent of front to be covered by the mortars is from A to B but concentrated fire is required on the salient and craters.

The mortars are so placed that each mortar section except No. 1 can cover the salient, and so that all mortars enfilade either portions of the enemy's front line or communicating trenches, while the fire of two sections can be crossed if necessary.

CHAPTER VIII.

TRENCH MORTARS IN ATTACK

76. *The attack is divided into two parts: The work to be carried out before and during the launching of the assault, and the advance of the mortars.*

In the preparation of the attack, trench mortars are frequently grouped on a portion of the line to deal with an objective that the artillery cannot deal with effectively.

The three inch mortar is not an efficient wire cutter. It can be used for making gaps in the wire, but not for destroying long lengths of wire. *This must be left to the heavier trench mortars,* but the three inch mortar can be used to prevent the enemy, by an intermittent fire during the night, from repairing the wire which has been cut during the day time by the heavier mortars. In the final bombardment, preceding the assault, the light trench mortars should concentrate their fire on the enemy's front line, heads of communicating trenches and machine gun emplacements, and when the assault is launched they should lift to other targets in rear of the front line.

Aeroplane maps should be carefully studied and all targets that trench mortars are able to deal with should be noted. Anything that looks like a machine gun emplacement, trench mortar emplacement, head of a communication trench, strong points and dead ground should be carefully noted. Each gun squad should be given a definite objective so that in the event of control being lost the battery would be able to go on and carry out its mission.

Arrangements should be made for communication, which might be telephones, orderlies or prearranged signals.

Arrangements should be made for the establishment of ammunition dumps in the enemy's lines.

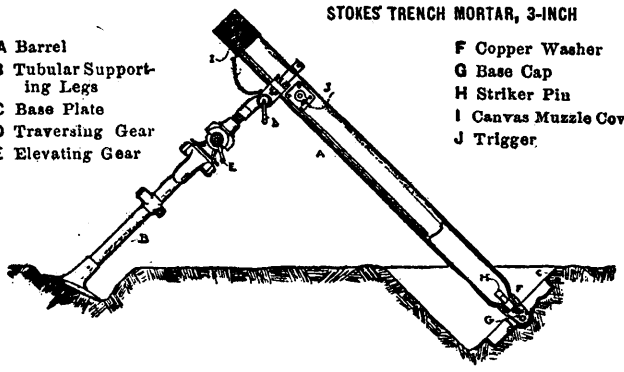
Carrying parties should be organized into squads and each squad should have a guide who would see that the ammunition was taken to the proper place. The best method of carrying the ammunition is to place 4 shells in two sand bags which can be tied together and slung over the shoulder. The guides should be taken up to the trenches and shown where the ammunition is stored and approximately where it is to be taken in the enemy's lines.

The line of advance across no man's land to the objective should be carefully studied. If possible select some object such as a ruined building, prominent bend in the enemy's lines or sap running out from his lines, anything that will aid the gun squad and ammunition squads to find their correct positions.

It is very difficult and practically impossible to lay down any hard and fast rule as to when to advance with the mortars, because the time will vary according to the nature of the objective and local conditions. But the trench mortar should not go forward until that portion of the enemy's line into which the trench mortars are coming into action is cleared of the enemy. Observers should be sent forward to give a signal when to move the mortars forward. Sometimes trench mortars are attached to battalions to support them in the advance. Having reached the objective, the trench mortars have to consolidate. This consolidation consists in the rapid construction of emplacements in suitable positions to cover the new front line. In selecting sites for the positions of the mortars, the same points are considered as when acting on the defensive. It is generally possible to find out, before the attack takes place, where the new communication trenches are going to be constructed. The mortars must be gotten rapidly into position to assist in repelling the inevitable counter attack. Then register and get the ammunition up and any spare time may be devoted to strengthening the position.

STOKES' TRENCH MORTAR, 3-INCH

A Barrel
B Tubular Supporting Legs
C Base Plate
D Traversing Gear
E Elevating Gear
F Copper Washer
G Base Cap
H Striker Pin
I Canvas Muzzle Cover
J Trigger



CHAPTER IX.

SAPPERS SECTION, SAPPERS AND BOMBERS PLATOON

DUTIES

1. The "Sappers Section" of the Headquarters Company of an Infantry Regiment has the following duties:

First: The construction and repair of such intrenchments and such posts of command and observation posts as may be necessary for the "Sappers and Bombers Platoon" (Stokes 3 in. Trench Mortar), in which work they should have the assistance of members of the Bombers Section. This is their first duty.

Second: They should then be utilized for duties in connection with dumps as follows: One (1) corporal and two (2) privates for duty at the Regimental Dump, in which is included the regimental grenade depot. Two (2) privates for duty at each of the three battalion dumps, in which are included the battalion grenade depots. Should no dump be provided for one of the battalions, those men originally for duty with that battalion dump, should be assigned to the Regimental dump or to some other battalion dump.

Their duties at the dumps are, in general, those of storekeepers, but they should also have a thorough knowledge of the mechanism of grenades and bombs, their fuzes and detonators.

These men also have charge of the fireworks stored at their respective dumps.

They should be acquainted with the general character of the fireworks which may be stored at the dumps, such as Rockets, Illuminating Cartridges, Signal Cartridges, Flares, Mortar Signals, Grenade Signals, Smoke Candles or Cases, etc.

Incidental to their duties as storekeepers, they keep their supplies, including all trench stores at their respective dumps, up to the prescribed amount. They may be used in digging and preparing the Regimental Dump. They may be assigned by the Regimental Commander to any other specific duties during operations.

INSTRUCTION

2. The commander of the Pioneer Platoon is charged with the instruction of the Sappers Section of the Sappers and Bombers Platoon in engineering work only. The other technical instruction of this Sappers Section, as well as the actual performance of their duties, as indicated in par. 1 above, is under the Commander of the Sappers and Bombers Platoon, to which the Sappers Section belongs, and independent of the Pioneer Platoon.

DETAILS OF STOKES MORTAR MOUNTING.

