

TRENCH WARFARE

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INTRODUCTION

It is a safe bet that when the German army started for Paris they had plans for use in the event of disaster. The disaster occurred, and a new type of warfare requiring the highest courage, skill and endurance was born. I say born because although trench warfare was known before, it died in birth compared to this war, for the amount of science, energy and variety of weapons used.

More earth has been removed by a combination of man, pick and shovel in making these trenches than was excavated to make the Panama Canal possible, and in less time.

It is my object in this book to give a faint idea and knowledge of the trenches, and to approximately explain the way warfare is carried on, and I offer the information contained herein as a basic foundation on which to use the further knowledge you will gain as an officer, and which, for obvious reasons, I will not and cannot give here.

The notes are all taken from different courses

of instruction, and observations made during thirty-one months of service, fifteen of which was spent on the Belgian and French fronts, both as private and officer in the infantry service.

I do not lay down my information as expert and final by any means, but as trench warfare changes from day to day, improvements are made, old ideas discarded, new ones tried, it can be seen that nothing can be laid down as a cut and dried rule, but the principles of trench building, generally speaking, remain the same. This I have endeavored to give, along with a few other notes which will give an idea of the many and varied tasks that a second lieutenant must know before he is fit to take hold of men in a place such as the Western Front, where there is very seldom a chance to rectify mistakes, or to experiment more than once.

When the British and French armies started their retreat from Mons, as far as the British army was concerned they were hampered by their want of knowledge of trench warfare as used in the South African war. The men retired day by day, hardly staying in one place long enough to dig themselves in. At that time for digging a trench system, one valuable lesson was learned, and that was, that the hole

such as they had been taught to make in just such circumstances as they were up against then was no good, as it offered them no protection from overhead shrapnel, and at the best of times made a very poor shelter. This hole used to be dug a little more than the width of a man and straight back his full length, he naturally throwing the dirt in front of him and thus making a little parapet.

When the battle of the Marne commenced and the British and the French drove forward, this valuable lesson and many others had been learned, so that when the armies had reached the limits of their endurance, instead of digging themselves in in the old style, a new system was used, greatly assisted by shell fire.

A round hole was dug by each man to fit his individual size and made to suit himself. Here he squatted and fought, if necessary, and got what rest was possible during that day, with the enemies' line at distances varying from 100 to 500 yards from him. During the night, these men when not fighting or bothered by counter-attacks, or trying to obtain rations, water and the many necessaries that a fighting man requires, deepened their shelters and joined them together by little narrow ditches. During the next day there might be bitter fighting, so it

would be even possible that other troops would come up and relieve during the early dusk. The relieved troops would retire a short distance and dig themselves another row of little holes where they might act as supports in case the temporary front line gave. During that night the holes on the front line would be enlarged until they finally joined and gradually without deliberate intention the trench became a permanent feature. Then the line slightly in the rear became connected with the front line system by what were then nothing more or less than ditches and this was the birth of the present system which now stretches from the sea to Switzerland.

The trench systems now generally consist of three complete lines or systems of trenches, each system being self-supporting and independent of the other. The second and third systems are generally laid with due consideration to protection, fields of fire, and all the other tactical requirements that are necessary to such a system; it being impossible in the majority of cases to keep these points in mind during the building of the first or original line. These systems generally run to a depth of six to eight miles from the front firing line. They are so constructed that when a firing line has been

broken through to any great extent, what was formerly a communication trench at once becomes a fire trench, and serves to bring a heavy enfilade fire on the troops occupying the captured area.

It must be remembered that the considerations, arguments, and notes laid down in this book cannot, under stress of circumstances, always be acted on. It will be found, however, that a certain amount of training and of study as to the conditions governing the sighting, building, and living in these trenches, will cause a man, even under great stress of excitement, to look for and try to obtain the ideal as a matter of habit and without giving much time and thought to the question.

The Art of War is "the greatest amount of common sense used in the shortest possible time."

J. S. S.

EDITOR'S NOTE

Mr. J. S. Smith, the author of this book, is an American, born in Philadelphia, who enlisted in the 29th Vancouver Battalion in the fall of 1914. He saw service along the Belgian front, and in August 1916 was given a commission in the British Army. He is now (June, 1917) serving with the British Expeditionary Force on the French front.

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TRENCH WARFARE

LOCATION AND CONSTRUCTION OF TRENCHES

In locating the site for a defensive firing line, it must be divided into three sections:—firing line, immediate support and reserves. In doing this several opposing factors should be taken into consideration and their relative importance judged according to the special circumstances and objects in view, keeping in mind the probable lines and manner of defense of the enemy, and whether the trenches are for permanent or for temporary use.

This may be summarized under two heads: first, with the object of attaining the greatest field that can be covered by defensive fire; and, second, the greatest security from offensive fire.

It will even be found that these two constructions will be in conflict. Trenches placed behind the crest of a hill, say fifty to one hundred and fifty yards from the top, will hamper the accuracy of the enemy's artillery fire. Shoot-

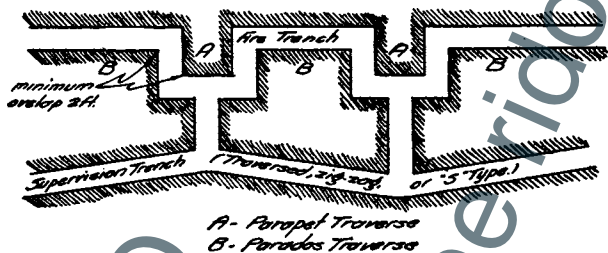
ing, to be effective, calls for a high rate of accuracy, and here the only observations possible are from aircraft and balloons; but the enemy side of the hill will be raised ground to the occupants of the trench. At night large numbers of the enemy could collect there, and the dangerous space to them would merely be the distance from your fire trench to the crest of the hill.

The enemy could and would entrench themselves on their side of the crest and by raising their parapet enjoy the advantage of a higher front, which would eventually lead to their entirely controlling the area behind your trenches, which are continually used by the relief and fatigue parties.

It is a principle that grazing rifle fire upon a defensive enemy is more effective than plunging fire, but any entrenched position higher than your own held by an enemy gives them a tremendous advantage. Regardless of what opinion may be held as to the maximum depth of a field of fire required to meet or repel attacks, whether in masse or open order, it should be obvious that the greater the depth of the field of fire and the more extensive the view of the enemy's operations, the better it will be for the defending forces.

tion being made and fill from there, if distance permits.

As a matter of fact, in every trench there is a continuous revetting, widening of communications or control trenches, or driving of a tunnel to a listening post.

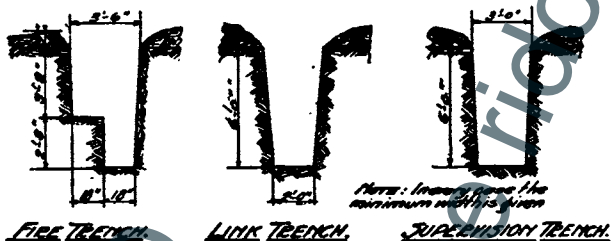


TRAVERSED & RECESSED TRENCH.

Inasmuch as the time for filling sandbags is never ending, if work is being done and the earth is not absolutely needed for parapet or parados, the earth, if dry, should be put in sandbags, and, if necessary, stored until it is needed. The repair work that is most necessary takes precedent and is about as follows: Any damage to parados or traverses should be immediately attended to. During the night any damage to the wire entanglements must be repaired. Drainage comes next in order of im-

be deepened to any desired depth, depending on the energy displayed. If of an extraordinary depth, steps must be cut to the fire platform.

In a great many different parts of the Western Front, especially Belgium, it was found that after digging to a depth of one to three feet water was encountered to such an extent that it



became impossible to dig any sort of a trench which would give adequate protection to the men involved.

When these conditions are run into, breast work parapets must be artificially built up above ground level with soil, sods and sandbags, supported by sandbags, hurdles or close wire netting, revetment and stakes. The same principles of thickness, depth, width, slopes, and in fact everything that applies to a dug-in trench, applies to breast works.

The "T" trench has many more advantages

than the few mentioned in the opening of this chapter. T fire-bays may be single, double or treble (that is with one, two or three bays). Fire-bays in any length up to 15 feet with 8 feet traverses are for firing purposes only, and the control trench, sometimes known as the lateral communication trench, as its name im-



S & T TRENCH.

plies, giving lateral communications, is used for that purpose only. Therefore, the fire-bays and control trenches can be narrower than trenches which have to be used for both purposes, thus lessening the amount of repair and revetment work required. And the intervening ground between these fire-bays gives the same result as a traverse used in a traversed trench system, and saves the labor of digging a more intricate system. The control trench gives an officer or N. C. O. in charge of the T bays a

chance to handle his men and fire in these bays without struggling around innumerable traverses and wasting time very often when a minute lost or gained means lives lost, or part of a trench system in the hands of the enemy.

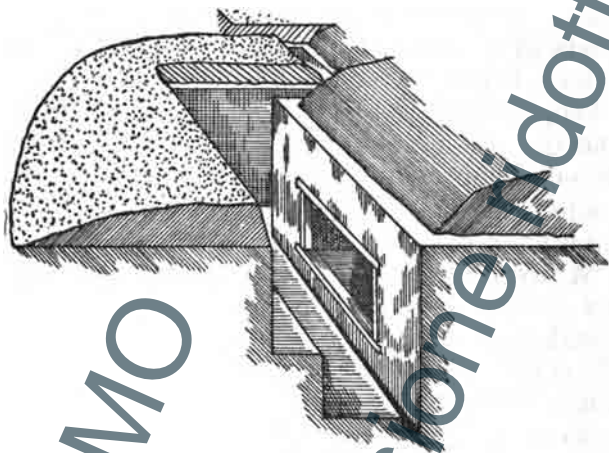
T bays may be sited with due and careful consideration while facing the enemy in an existing trench system. Thus it gives you the advantage of being able to take into consideration all the requirements of the field of fire, control of isolated areas, and the obtaining of maximum results from enfilade fire. These T trenches may be dug out from the old system without undue exposure of your men and if distance between the lines permits, and it is entirely possible to construct a new and generally more favorable line of trenches within 100 to 200 yards of the enemy's trenches. Intervening ground between these T bays must be completely controlled by entanglements and mobile machine guns, or automatic rifles, able to operate from different alternating recesses in the control trench. Fire platforms should be placed in recesses at intervals in the control trench from which covering fire can be given. Artillery fire to damage a T trench, must be very accurate. In a traversed trench a shell destroys not only lateral communication, but

the defenders as well, whereas with a T shape, both fire-bays and control trench have to be ranged and hit. The success of the enemy is entirely local when capturing one of these T-bays, and he may be shelled by your own artillery without any danger or risks to those defending their T-bays. Control trenches should be dug first and zigzagged with the longer stretches facing the enemy. This gives you another fire-trench as well as a communication trench, and is also ready for use at any time needed before the T-bay is completed. On the completion of the T-bay, the corners of the zigzagged trench must be rounded off to make it easier and quicker for the movement of troops and carrying of stretchers.

DUGOUTS

It is only under very exceptional circumstances that under-cutting a trench wall is allowed, and then the shelter should be cut in the rear wall only. These shelters must be carefully supervised and watched by the officer, as men are very often careless, with the result that the shelters are dug in a hurry and poorly. Then it rains, the shelter falls in, and the men are no

more. It should be high enough for a man to sit up straight, and long enough for him to lie down in, and deep enough for two men to lie side by side. It should be raised at least a foot



FIRE TRENCH, SHOWING ENTRANCE TO SHELTER

The shelter is of use only in a narrow or deep trench. Note that the floor is above the bottom of the trench.

above the floor level in the trench to prevent water from the trench floor coming in. A shelter smaller than these dimensions is useless. It has a demoralizing effect, destroying all activity, mental and physical. These shelters can

only be properly made by cutting into the rear trench wall the necessary depth and length and right to the top. Then, with any material which is convenient, such as corrugated iron, brush wood, old rubber sheets, revet the sides and back. A corrugated iron roof is supported on posts at a depth of about a foot to a foot and a half below the normal level of the ground. Then, when possible, cover this with rubber sheets. If not possible to procure rubber sheets, simply cover with dirt excavated from shelter, taking care that it does not rise higher than your parados.

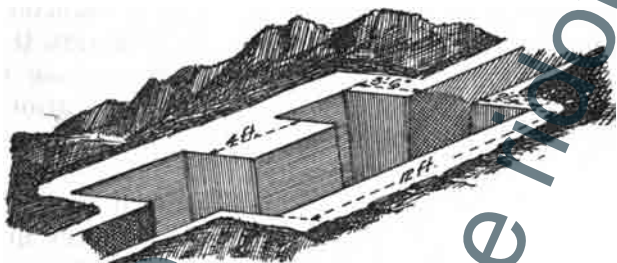
A fire-trench, however, is not a proper place for shelters, and they are generally better as a weather protection than a shell-proof shelter. Even this should not be favored too much, as it tends to cause obstruction, delay and inconvenience in the passing of troops. The real dug-outs for the accommodation of men holding a line are generally behind the fire-trenches in an immediate support line, or as in the case of T-bays, in the control trench and communication trenches leading to and from them. These are large dug-outs, having a depth of 30 and 40 feet, and in some cases capable of holding 100 to 250 men, generally having from 5 to 10 exits and entrances. Here the men stay during bom-

bardments and are generally safe from any caliber shell which may light on top, unless a half dozen should light in the same particular spot.

This work is generally of a very skilled and technical kind. Plans, drawings and labor are supervised by the engineers, expert tunnelers being used in constructing work, although the infantry supplies working parties to dispose of the dirt, etc., resulting from these excavations and to carry the materials and tools needed and required in the construction.

The design and general scheme of a small dugout which can be made by the infantry under the supervision of an officer, without the aid of an engineer, are here given. The dugout should be approximately 6 feet from floor to roof and about 8 feet wide, with an approximate length of 12 feet, thus allowing men to lie down and yet leave room for passage through. The width depends upon the number you intend to have occupy it. Each man requires 18". Depth to be dug below ground depends entirely to what extent you may raise the roof upon the ground without making an unduly exposed hump which will at once tell the enemy a dugout is there. The thickness of the roof should be approximately 6 feet, constructed with side

posts, cross beams, corrugated iron, water proof oilcloth, sandbags and soil. Sandbag revetments should be used in the strengthening of side posts. When possible, although hardly ever so, walls should be lined with waterproof

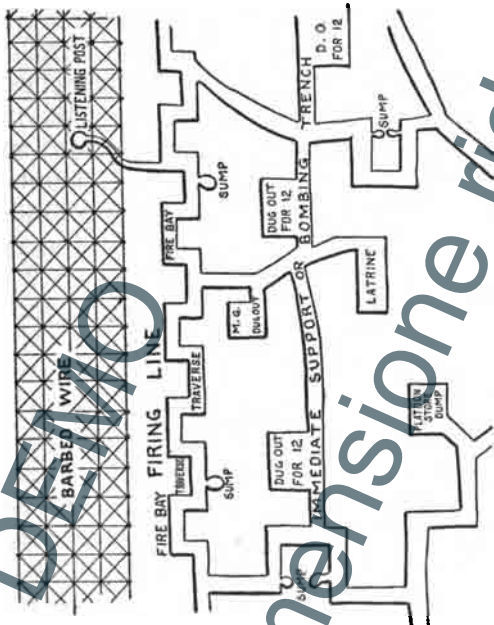


DUG-OUT WITH ROOF REMOVED.

Dimensions variable. Note the wide berms permitting the use of strong roof supports. A layer of large stones to cause early shell burst should form part of the roofing.

oilcloth and entrances so placed that they get as much sun as possible.

Great care and attention must be given to these dugouts, and even though taking a little longer than seems necessary, care must be taken to see that they are substantially constructed, otherwise they are in a constant source of danger of cave-ins during heavy shelling and bad

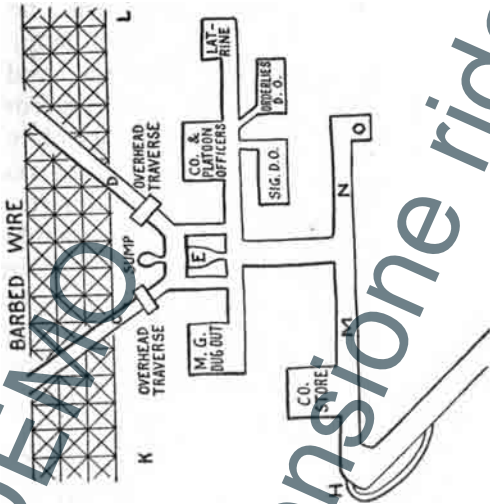


SECTION I
SKETCH OF TRENCH SYSTEM

center of the traverse and fire, kneeling or standing, through a loophole at the advancing enemy. The recess gives him ample protection, including head cover, and is so cut that the entrance is out of alignment with the trench behind him and he will be unaffected by a bomb exploding there. At the same time he may work with, and direct, the bombers behind him who are bombing over the traverse, and if it becomes necessary, they can also take cover in the entrance to the recess. The loophole should not be placed so high that it becomes possible for the enemy to come forward under it.

The most dutiable arms for the members of the defending bombing party detailed for this traverse work are what are known as "close-contact weapons," generally including revolvers, bombs, trench knives, and very often a bayonet carried by pushing it down in the puttee.

SECTION II. The time and claims of rapid transit will not allow the traverse system as employed in Section I to be continued, the narrow single-traffic C. T.'s, from wear and tear and shell fire, soon become wider, and as the width would allow rapid transit to friend and foe alike, it is of the utmost importance that some means be adopted to deprive the enemy of this

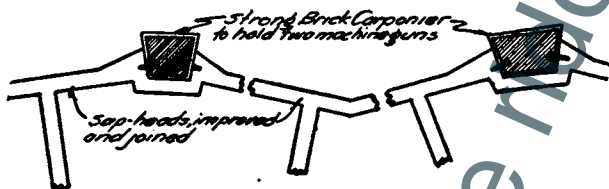


SECTION II
 SKETCH OF TRENCH SYSTEM

advantage. Moreover, the enemy may have successfully advanced down on traversed C. T., say, at "C," and our own bombers might still be fighting in another traversed C. T., say, at "D," and their needs demand protection. This may be obtained if, before the single C. T.'s merge into the double, each of them be quite straight for approximately 15 yards, and island-traverse, "E," be placed at the junction. In the rear of this island, "E," is a large and substantial recess, into which one or two Lewis guns or automatic rifles can be placed, firing through loopholes and rendering hostile advance down both "C" and "D" communication trenches almost impossible. The recess in "E" must allow ample room in which to operate. Overhead cover is provided, and one rifle would require one long loophole, so that it could fire along either C. T. without more than a moment's interruption. In the case of two rifles being available, there could be two such long loopholes, each covering both C. T.'s, one for kneeling and one for standing. The lower loophole gives the advantage of it being impossible for any of the enemy to get out of danger beneath it. The fact that the traverse is an island one, with passageway either side, would allow friends to advance round the traverse and up

“D” to the support of friends still fighting there, and without obstructing the fire directed from the traverse at enemy advancing down “C.”

An island-traverse so constructed and manned should be unapproachable along either trench “C” or “D,” but precautions must be



ISLAND TRAVERSE.

A type used to control long, straight stretches of trench.

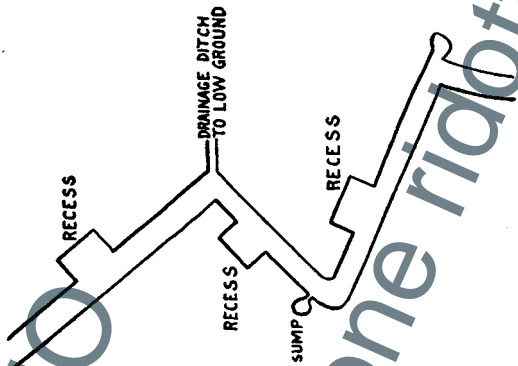
taken to prevent the enemy avoiding it by coming out into the open, as in active moments C. T.'s become as mutilated as fire trenches and the enemy may leave the C. T. before reaching the 15-yard stretch and approach the traverse from above or flank. In anticipation of this, the position “H” is selected slightly in rear and to flank of the traverse, and in this position one of the automatic rifles may take up, either originally or by retirement from “E,” and deliver the required traversing covering fire across the

front of "E" and giving adequate protection to the garrison manning the island-traverse. Barbed wire is also generally placed in open ground such as this described, say, for instance, between "K" or "L" on either side of the 15-yard stretches to impede hostile exit and advance. The overhead traverse just in front of the island gives protection against bombs thrown down on C. T.

When covering fire is not required, the position "H" will form an alternative position should the island-traverse be destroyed by shell fire or taken by the enemy; but the latter will be of little use to the enemy as their progress passed it is blocked by a loophole placed at "H" and covering the trench "M" down which they must advance. It also covers a dummy trench, shown as "N," down which there is a fair chance that the enemy would naturally go if a misleading notice were placed at the junction of "M" and "N." The slight turn at the end, "O," will prevent premature knowledge as to the real nature of this trench. The enemy's progress may also be blocked for a short time by having rolls of looped wire, sometimes known as concertina wire, so placed in recesses in the side of the trench, and so arranged that when a man retiring down a trench can catch

hold of the roll as he passes a recess, uncoils it as he runs, leaving it in the trench in a badly tangled mass.

SECTION III. Supporting trenches may be at any distance from 30 to 300 yards behind the firing trenches. The C. T. in this section is constructed on the same lines, or may be constructed on the same lines, as Sections I and II, into whatever proportions local conditions and practical considerations, and particularly dangerous places, may dictate. The zigzag plan shown in the sketch is generally safe to adopt, as it allows rapid transit with a certain amount of concession to the claims of protection, more so as it approaches the fire trenches. These C. T.'s generally should be a series of straight stretches, zigzagging at acute or obtuse angles, the length and angles governed by local conditions, the extent and direction from which each stretch might be enfiladed, and the gradient and distance from danger. It has been shown before that the shorter the stretches and the more acute the angle at the turn, the less is the danger from enfilade fire, but the C. T. with this advantage requires a greater length of time and labor in digging, as well as taking a great deal more time and effort to pass through it. In order to lessen these things as much as possible,

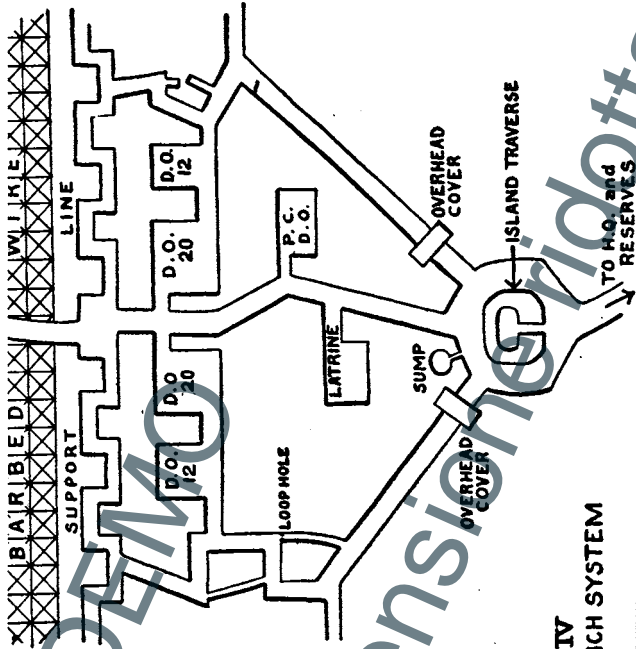


SECTION III
SKETCH OF TRENCH SYSTEM

it is always considered best to adopt longer stretches and more obtuse angles as soon as possible.

The excavated soil is naturally thrown up on the side facing the enemy, and thus forming a parapet. It can at times be used as an actual fire trench. The parapet should fulfill the same conditions as the parapet of a fire trench, and where necessary, overhead traverses should be placed. The more of these overhead traverses used, the longer can the straight run of trench be. When running up-hill, facing the enemy, it is clearly obvious that acute turns and short stretches are necessary, or, if it is not found advisable to use these and more time can be gained by digging the straight runs, then they should be dug deeper and a great deal of care taken in placing the overhead traverses.

Generally, the farther the C. T. from the enemy, the less necessity to take measures for stopping hostile advance down it, but it is a safe thing when time permits to loophole the traverses facing the long straight stretches either in an ordinary traverse or when time permits the building of island-traverses, especially at junctions. Such loopholes command the straight stretch in front and are reached by narrow trenches very similar to a drainage



SECTION IV
 SKETCH OF TRENCH SYSTEM

do not possess the temperament and qualifications necessary to make efficient bombers, and for this reason in every platoon there should be a bombing squad of one N. C. O. and 8 men, with a higher degree of training and efficiency as bomb throwers than the remainder, although all hope must not be given up for the remainder.

These men are available either to work with the platoon or to provide a reserve of bombers for any special job, such as raids, cutting-out parties, and clearing trenches just occupied. Only the very best men in each platoon should be chosen, taking into consideration physique, courage and steadiness, although it is not always the big man physically that makes the best bomber. The responsibility for the training of these men rests with the battalion and company commanders.

TRAINING

The first step is to overcome a man's natural fear of the grenade itself. This is only done by explaining how it is to be used, the method of lighting and the length of time taken for the fuse to burn. A good idea is to have some of the fuses of the length used lighted and the men

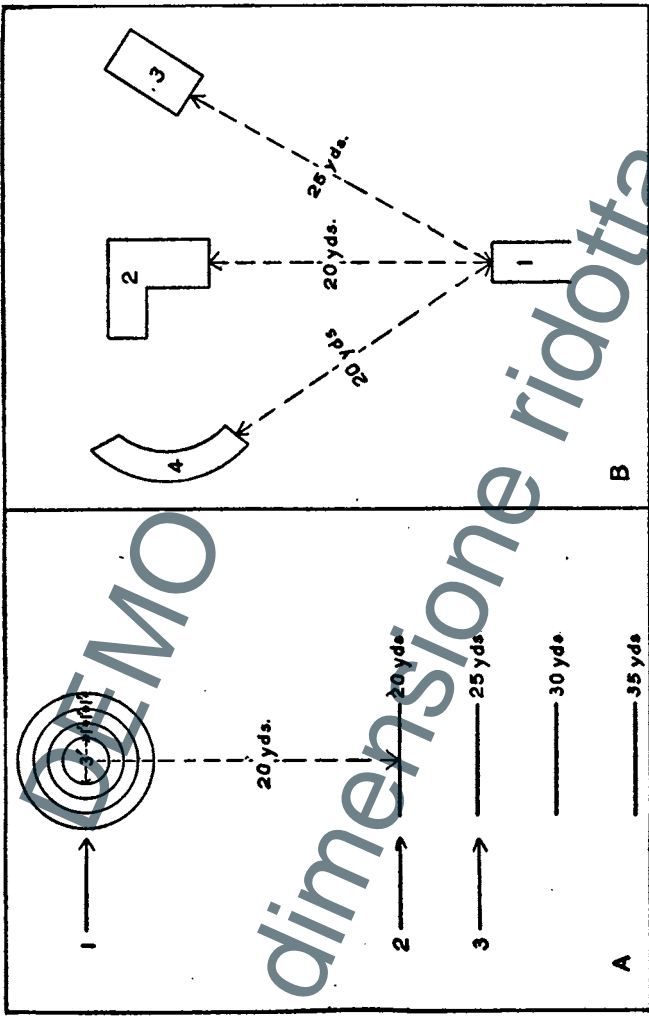
told to count while the fuse burns out. Dummy grenades with fuses attached can then be introduced and the men taught to light them, observing carefully how long it takes for the fuse to burn down to the grenade.

The second step is to develop accuracy in throwing. Normally, the bomb should be bowled overhand, although it is certainly not wrong to throw, but it has been found in tests that a man throwing bombs has tired a great deal quicker than a man bowling them overhand.

Stick grenades may be thrown over short distances like a dart, although this is unhandy and can only be done by a carefully trained man. Great care must be taken while in the trenches in throwing percussion bombs, as very often a man swinging his arm back to throw such a bomb has exploded it in the trench, with disaster to himself and those near him.

Men should be taught to throw standing, kneeling and prone. It should be impressed upon them from the beginning that if a grenade with a time fuse is dropped in the act of throwing there is ample time to pick it up and throw it out of the trench before it explodes, but this must be done immediately.

A is a diagram of a bombing field where men are trained in practice with dummy bombs. 1 is



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the target marked on the ground and having the same general plan as a firing target, with Bull, Inner, Magpie, and Outer, the score counting 5, 4, 3, & 2 respectively, or according to the instructor's taste. 2 is the first line, 20 yards from the center of the inner ring. The men *must* be trained to a high degree of accuracy at this range. 3 is the second line, 25 yards from the center of target. There are lines every five yards back until the 40 yard line is reached, which latter is the extreme range for bombing practice.

At each range the men should practice standing, kneeling, and prone. At 35 and 40 yards bombing from the kneeling and prone positions is very difficult and the time spent on practice here should not interfere with the obtaining of great accuracy at the shorter ranges.

At all ranges the men should be allowed to throw any number of dummy bombs, but should not be permitted to fatigue their arms.

B is a diagram showing the arrangement for trench practice with dummy bombs. Small trenches are built on the surface of the ground by screens of wire mesh covered with burlap or other similar material. 1 is the thrower's trench and is built so high that he cannot see over the top. From this he throws, using a periscope

for observation. 2 represents part of a traverse and fire-bay, the front part of which is about 20 yards from the throwing trench. 3 is a section of straight trench about 25 yards half right from the thrower's front. 4 is a section of curved trench about 20 yards half left from the thrower's front.

The general custom in the practice trenches is to give the man any desirable number of dummy bombs, say 18; 6 for each trench. Four out of six are required to be put in No. 2, and 3 out of 6 in Nos. 3 & 4. Men must not be kept at bombing practice too long at a time as it spoils both their interest and their aim.

In taking a line of trenches, it is well to remember that the attack will take place on a relatively small front by a large number of men, and therefore when the trenches are finally reached, there is liable to be great overcrowding in them. This can only be prevented by extending them along the trenches as quickly as possible, and is of the utmost importance as heavy casualties will result from allowing this overcrowding. To make this extending possible, it is the duty of the bombing parties to work along to both flanks of the trenches and take advantage of the temporary confusion of the enemy by obtaining as much of his trenches as possible,

thus allowing for the extension of men. In a narrow trench the only portion of an attacking party coming into contact with the enemy is the head, or what is known as the Bayonet Man. The bombing party is composed of the following:

1. Bayonet man,
2. First thrower,
3. First carrier,
4. First spade man,
5. N. C. O. first squad,
6. Second bayonet man,
7. Second thrower,
8. Second carrier,
9. Spade man, in charge of second party.

These parties will work up a trench until they come to a junction, when the first party in charge of the N. C. O. will continue straight on and the second party branch to the right or left, as the case may be, and as they come on other parties keep working up behind them, and the infantry gradually following taking possession of the line and starting consolidation work at once.

Communication throughout these lengths of grenade parties is very difficult with men ex-

tended in single file, and the attendant confusion which accompanies such a stand.

A system is required which will enable supplies of bombs to be passed up and casualties replaced automatically. This system cannot be laid down on any cut and dried lines, but must be figured out before the attack, with due consideration being given to the line of trenches to be attacked and the difficulties which will be encountered in getting supplies to that line, and it is only on the spot that such a system can be worked out.

During an attack three grenades per man are issued to each unit detailed to open the attack, and these grenades are turned over to the bombers or used by the men themselves if necessary. When out of grenades themselves, the men take over the casualty's, and it is the duty of a casualty when he is so able to, to leave his grenades and ammunition to the care of some other man before "going down." Small depots should be established at frequent intervals along the trenches from which the attack starts, with careful consideration given to their safety from shell fire, if at all possible. Other depots must be established in the support and assembly trenches, and these will generally be supplied

through a central station probably controlled by a brigade or division.

Before starting the attack, every man and party should have had explained them in detail exactly what is required of them, and generally the following system is adopted:

First bombing party of group—

Two bayonet men to protect grenade throwers,

First bomber,

First carrier,

Second bomber,

Second carrier,

Group leader (N. C. O.),

Two bayonet men to protect the group leader and the rear of party.

Second bombing party—

Formation as above. The head of the party must be in touch with the rear of the first party. Officer commanding in rear of second party.

Third and fourth bombing party—

Formation as above. Second in command in touch with rear of fourth party.

Machine gun detachment, if available or considered necessary.

Ammonal. A new explosive which is absolutely safe to handle, not being sensitive to shock or even bullets. It does not freeze and can only be exploded by means of a detonator. It easily absorbs moisture and should be kept dry.

Cordite. Is made in strands and is the explosive used in small arms ammunition.

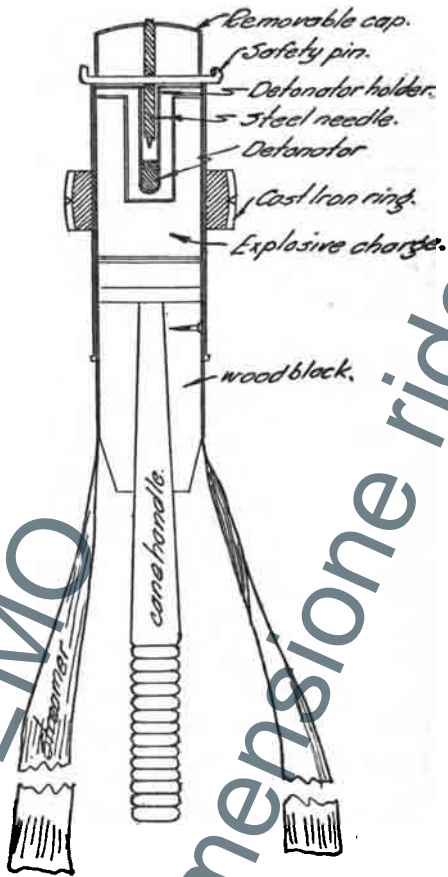
BOMBS

There are three kinds of bombs: (1) *percussion*; (2) *ignition*; and (3) *mechanical*. It is not possible to describe every bomb in use under these three headings, but the most typical are selected for description, although it does not follow that they are all in use at the present time, but will give a fairly good idea of what is required.

PERCUSSION BOMBS.

1. Hand Grenade No. 1.
2. Hand Grenade No. 2, formerly known as Mexican Hand Grenade.
3. Rifle grenade No. 3, formerly known as Hale's Rifle Grenade.

Hand Grenade No. 1 consists of a brass case



Length complete $12\frac{1}{2}$ "
Length of handle 5"

HAND GRENADE NO. 1.

screwed on to a block of wood, to which is fixed a small cane handle about half way up the case. Outside it is a cast iron ring serrated into 16 parts. The upper end is covered by a moveable cap with a striker pin in the center. On the cap are the words "Remove," "Travel," and "Fire" in duplicate. These are marked in red and can be made to correspond with red pointers painted on case. To prepare a bomb, turn cap so that pointer is at "Remove," take off cap, insert detonator in hole and turn it to the left until the spring on the flange is released and goes into position under the pin; replace cap and turn to "Travel," which is a safety position. When the bomb is to be thrown, turn cap to "Fire" and then remove safety pin. This bomb explodes on impact, and to insure its falling on the head, streamers are attached. Care should be taken that streamers do not get entangled. The bomb must be thrown well into the air.

Hand Grenade No. 2 is similar to the above, except that a special detonator is screwed in from the head, and that the striker pin, in this case, is at the bottom. The detonator having been inserted in the bomb is ready for throwing as soon as the safety pin has been drawn.

Rifle Grenade No. 3, more commonly known

as Hale's Rifle Grenade, consists of a serrated steel case filled with T.N.T. and a composite explosive. At the bottom of the case is a brass ring fitted with wind vanes, which keeps in place two small steel retaining plugs, securing the striker. In order to prepare this grenade for firing, the steel rod attached must be put down the bore of the rifle. The safety pin is then withdrawn, the collar pulled down and the wind vane given a slight turn. The rifle is then loaded with a special cartridge containing 43 strands of cordite. When charging the rifle the bolt must be well pushed home. When the rifle is fired, the explosion of the cartridge speeds the grenade on its way and the air passing through wind vanes causes the ring mentioned above to unscrew, and the two retaining plugs to fall out. The striker is now free, and when the grenade reaches its destination and comes in contact with the ground the shock compresses the creep spring and the needle of the striker is forced into the detonator, exploding the grenade.

Special screw-in detonators are supplied with this grenade, as well as in Grenade No. 2, and care should be taken not to mix the two detonators, as the Rifle Grenade Detonator is slightly longer, and if fixed in the wrong gre-

nade will cause premature explosion and much sadness. These grenades have an accurate range of from 250 to 350 yards.

IGNITION BOMBS. The following bombs come under this heading:

Hand Grenade No. 6.—Grenade light friction pattern.

Hand Grenade No. 7.—Grenade heavy friction pattern.

Hand Grenade No. 8.—Formerly known as double-cylinder light pattern.

Hand Grenade No. 9.—Formerly known as double-cylinder heavy pattern.

Battye Hand Grenade.

Pitcher Hand Grenade.

Oval Hand Grenade.

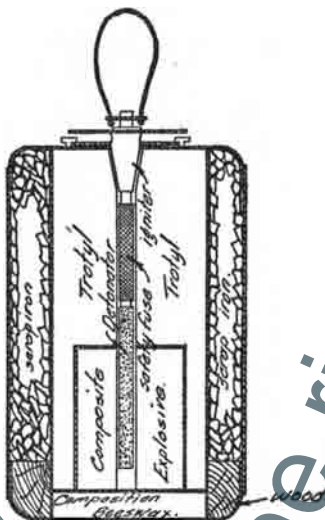
Ball Hand Grenade.

Hand Grenades Nos. 6 and 7 consist of metal cases filled with T.N.T and a composite explosive and are exactly alike, except that No. 7 contains shrapnel bullets or scrap iron, while No. 6 contains only explosive. At the top of each case is a place to fix the friction igniter, which is supplied separately. When these bombs are to be used, detonator fuse and igniter are put in and firmly fixed. Before throwing the becket on, head of igniter should be pulled smartly off.

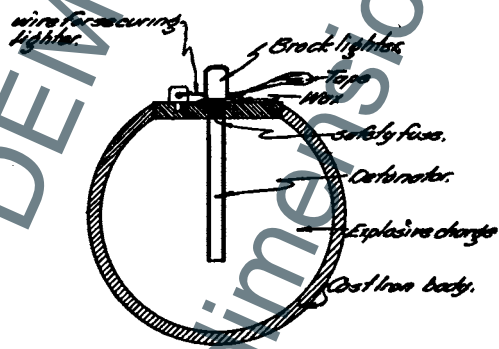
Hand Grenades Nos. 8 and 9 are similar to the above, except that the fuse is lighted by a Nobel Patent Lighter. The *Battye Grenade* consists of a grooved cast iron cylinder filled with explosive. The top is closed by a wooden plug pierced centrally for insertion of detonator and fire.

The Pitcher Hand Grenade is very similar to the Battye, only different in that it is slightly heavier and having a different patent lighter. This lighter is somewhat complicated and special instructions should be given before the grenade is used.

The Nobel lighter consists of two cardboard tubes, one fitting over the other. Inside the top end of the outer tube there is a layer of friction composition; fixed to the top end of the inner tube is a forked brass friction head, which is held in position by a safety pin fastened through both tubes. Inside the other end of the inner tube is a small copper band, into which the fuse is fitted. At the joint of the two tubes there is a narrow tape band with a loose end. To light the fuse, pull off tape and safety pin, then press down outer tube and turn slightly. This lighter has a five-second fuse attached.



SECTION.
 Dimension of Cylinder 4 1/2 x 4"
HAND GRENADE NO. 7.



SECTION.
 Diameter of Grenade 3"
BALL HAND GRENADE.

DEMO
 Primer Stone
 ridotta

The Oval Hand Grenade is an egg-shaped cast iron receptacle filled with ammonal. One egg has a steel plug and the other a flanged brass plug bored centrally, to which a hollow copper tube is fixed to take the detonator. This grenade is set off by a Brock fuse and lighter.

The Ball Hand Grenade consists of a cast iron sphere, 3 inches in diameter, filled with ammonal and closed by a screwed steel plug which has attached to it a covered tube to take detonator in the center of grenade. It is also lighted by a Brock lighter.

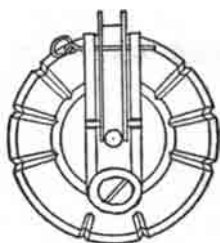
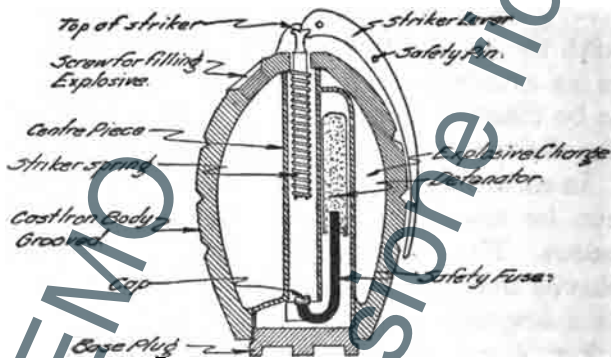
JAM-POT BOMBS. In the early stages of the war it was found necessary to make bombs on the spot. The material used was generally a jam tin filled with shrapnel bullets, scrap iron, powdered glass and grass, etc. This was exploded by 2 one-ounce primers, two ounces

The Brock lighter consists of a match-head and fuse combined. The head consists of a small cardboard cup filled with friction composition and covered with waterproof paper. With this type of lighter an armlet covered with match composition is worn by the bomber on the left forearm. To ignite fuse, first pull off waterproof paper and then strike head against armlet. Time of fuse 5 seconds.

gelignite, blastene or ammonal, and detonated by a No. 6 or 7 detonator, to which was attached a five-second fuse. The time could be regulated by length of fuse.

MECHANICAL BOMBS. *Hand Grenade No. 5*, known as *Mills' Hand Grenade*. Mills' Hand Grenade No. 5 weighs about one and one-half pounds and is in constant and steady use at the front, being the best known of all grenades. It consists of an oval cast iron case, containing explosives and serrated to provide numerous missiles on detonation. In the center is a spring striking pin, kept back by a lever or handle, which, in its turn, is held in position by a safety pin.

Detonators and percussion caps connected by a short length of fuse are supplied with these bombs. When the bomb is to be used the bottom is unscrewed and the combined detonator and percussion cap is inserted in the space provided for it, the percussion cap being placed in the boring under the striking pin. When this is done the bottom is screwed on again as tightly as possible, using the special spanner provided for this in each box. Before throwing, the safety pin is removed and the bomb held with the lever in the palm of the hand. When the bomb is actually thrown the lever or handle is

*PLAN.**SECTION.*

Dimensions of Grenade 4" x 2 1/8"

HAND GRENADE NO. 5 (MILLS)

released; this releases the spring, which forces striker down on to the percussion cap, ignites fuse, sets off detonator and explodes bomb.

GAS WARFARE

The use of poisonous and asphyxiating gases, which was first adopted by the Germans in the Ypres salient in April of 1915, is now becoming an accepted fact in the present war. It is to a certain extent in one shape or another, before one every day of his life in or near the trenches. Every one should therefore be well acquainted with the various ways in which gases are used in an attack, as well as precautionary methods to be taken in counteracting its effects while on the defense.

In an attack there are only two methods which can be used—emanation and shells and grenades. The emanation method can only be employed under very favorable circumstances and in a few cases where rather a long chance was taken, it reacted very badly on the enemy. The first thing to make a gas attack successful must be a favorable breeze of about five miles an hour, as if the wind blows any faster it does not give the gas a chance to settle down into the trenches. The object of this gas is to create a poisonous and irritant atmosphere, and this is accomplished either by a gas forced through

tubes in the direction of the enemy, or a liquefied gas stored in cylinders under very high pressure. To be successful, as before mentioned, the wind must be a steady breeze of not much over 5 miles per hour, no rain, and the element of surprise must figure very largely. The gas used must be heavier than air and not allow of being held back by any protective measures taken by the enemy. If the wind is too strong, it is obvious that any gas employed will be carried too quickly over the enemy's trenches, so that it cannot settle to any degree which will allow of its obtaining the desired effect. If the wind is too light, it will be carried up into the air by local eddies, or may even be blown back.

For these reasons it is impossible to fix a definite hour for gas attacks, as everything depends on the wind.

Arsenic and phosphorus compounds are used in the tube method, and their presence can be detected at once by the smell of garlic. Should such gases get into your own trenches, chloride of lime scattered freely about will disperse them.

The gases used in liquid form from cylinders are a mixture of chlorine and other matter annoying to the ordinary infantry officer and

soldier. If successful in surprising the enemy, their trenches should be cleared at once, but if the element of surprise is not there and time is given for defensive measures to be taken, the effect is lost. In an assault following a gas attack, men should always wear smoke helmets for at least 30 minutes after the gas dissemination has ceased, and the assaulting party must have the strictest orders not to remove their helmets until the officer in charge has given the command.

In the shell and grenade method of dissemination, shells and bombs are used containing liquid gas, or a substance which gives off irritant fumes.

It is easy to tell a gas shell when it lights as it comes down, the same as a "dud" shell; that is, one which does not explode, the outer casing of the shell simply collapsing. The liquid soaks into the ground, and men should be warned against standing over this ground and inhaling any of the fumes, which are very slight and rather hard to notice but very powerful and with very quick action. When a man thinks he has inhaled any of this gas he should at once be made to lie down, not undergo any exercise whatever, and as soon as possible have him

carried out on a stretcher to the dressing station.

Tear shells, which are used in great profusion during an attack, are for the moment blinding in their effect, causing smarting of the eyes and a great amount of watering. This effect is only for a minute, and the men must be impressed with the fact that if they continue moving forward instead of sitting down and rubbing their eyes, it will pass off almost at once. These shells are also greatly used against the artillery during heavy bombardments. Adequate protection is furnished in the shape of goggles to fit over the eyes, as the gas has no other effect whatever.

As in other branches of military art, the best means of learning defense is to have a thorough knowledge of attack. Thus, direction of wind must always be noted, and if favorable for an enemy attack, special observers must be placed to give warning and surprise guarded against in every way. Sentries are specially placed in the trench, and often in listening posts, to get early warnings of an impending attack. If a sentry at a listening post discovers that a gas attack is being made, he at once warns the sentry at the end of his cord or wire, giving a pre-arranged signal. This sentry passes the

alarm on a Strombon horn, which is something similar to a Klaxton, and will automatically give a warning which can be heard for 3 or 4 miles, and which lasts about a minute.

When a horn is not in use, generally shell cases are hung in the trenches. These are beat on by the sentry who is warned and taken up all along the line. It is then the duty of that sentry not for the instant to put on his gas helmet, but to proceed along the front line waking all the occupants of dugouts, etc., who may be sleeping in the area guarded by him. Every man without exception stands to in his trench with his helmet on and will not reënter dugouts until first given permission by officer or N. C. O.

These attacks are generally carried out, when possible, just before dawn or during the middle of the night, and the only warning given before the actual gas reaches a trench, is a slight hissing sound which is made and can be easily heard as the gas escapes from the cylinder. Great care must be taken when the wind is favorable for an attack that this sound be listened for.

Any man wounded during a gas attack must not be placed in a dugout or on the bottom of a trench, and even if considerable shell fire be going on it is far better that he be laid out in the open on the top of the ground, where he will

have a far better chance than lying in the bottom of the trench or in a dugout. After gas has passed through a trench system, and before the officer thinks that it is safe to remove the helmets, the trenches must be sprayed with a machine known as Vermeral Sprayer. A man with this sprayer on his back and wearing his helmet, slowly traverses the trench working the spray. This small tank on his back is charged with nothing more or less than "hypo" (sodium hyposulphite), about 6 pounds of which is dissolved in a bucket of water and a handful of ordinary washing soda added.

Garden syringes and buckets may be used if sprayers are not available, but their effect is not so quick.

When the officer thinks that the trench has been sprayed sufficiently and all gas has gone, he may then allow the men to take off their helmets, but not to reënter their dugouts until they have been thoroughly cleaned.

This is sometimes done by fanning the gas out, sometimes by building a fire and smoking it out, and by the use of the sprayer. Great care must be taken that no one enters until every last vestige of gas is gone, and it is generally well that the medical officer should inspect infected dugouts before allowing the men to return.

GAS MASKS OR RESPIRATORS

The Box Respirator at present in use on the Western Front is the latest improvement, and proof against any gas that so far has been used, but should such a thing happen that a man be caught without his box respirator, any of the following improvised methods are good:

1. Wet and ring out any woolen article, such as a stocking, muffler or cap comforter, so as to form a thick pad large enough to cover the nose and mouth, and press firmly over both.

2. Place in a scarf, stocking or handkerchief, a pad of about three handfuls of damp earth, and tie firmly over the nose and mouth.

3. A wet cap comforter will be found useful as additional protection, especially against certain gases other than chlorine.

4. A cap comforter wetted with water and soda solution or tea, folded into eight folds and firmly held over the nose.

5. A sock folded fourfold similarly wetted and held or tied. If the sock or comforter has been soaked in soda solution it will act efficiently when dry, though, if possible, it should be moist. The spare tapes from puttees may be used for tying on the sock or cap comforter.

6. Any loose fabric, such as a sock, sandbag, woolen scarf or comforter, soaked in urine, then wrung out sufficiently to allow of free breathing and tied tightly over the nose and mouth.

In the absence of any other cloths, the flannel waistbands issued for winter use could be used for this purpose.

Every officer defending a trench against an enemy gas attack should endeavor to collect information whenever possible to be sent to headquarters regarding the capture of apparatus used by the enemy either for disseminating or protection from gas. If a gas shell attack is made, unexploded shells or portions of them should be sent; the time of day, duration of attack, color, taste or smell of gas used, effect on the eyes, breathing, and all other symptoms should be noted. New gases may be used at any time, and speedy information greatly helps the adopting of protective measures.

The area of the gas attack is very large and will sometimes cover as far back as 12 to 15 miles behind the lines, although at that point it is not generally dangerous, but for three to four miles the gas has a killing power, and precaution should be taken anywhere within that length of the firing line the same as though in the firing line.

Another nuisance resulting from a gas attack is the wholesale slaughter of rats and other animals that infest the trenches, and while a very unpleasant job, steps should at once be taken to gather these beasts up and bury them in some place, obviously for sanitary reasons.

DUTIES OF A PLATOON COMMANDER AT THE FRONT

GENERAL NOTES: The selection and training of section commanders is of the highest importance, and a commander must assure himself that the man selected has the confidence of the men as well as his own.

A platoon commander should know his men and all about them, and keep a record in a book arranged in sections always kept up-to-date. This is easy to say, but harder to do, when the platoon changes day by day.

He should know his drill and be capable of moving the platoon into any position easily and by the shortest possible route.

He should know how to organize a task allotted to him, such as delivering over a working party, placing a line of sentries, arranging

posts and reliefs, and occupying a line of trenches.

He should be able to assume responsibility for all trench stores, bombs, periscopes, etc., handed over to him.

He should know the geography of his battalion trenches, the position of company and battalion headquarters, and keep trained guides at hand who can find their way to all important points by day or night.

GOING INTO THE TRENCHES

Platoons generally enter by not more than two sections at a time, thus minimizing the danger from shell fire and delay at entrance to communication trenches.

Before leaving billets, platoon commanders should explain fully to sergeants and sections commanders the extent of trench to be taken over and the steps to be taken in case they are caught by shelling or rapid fire going up to the trenches. Arrangements should also be made that if casualties occur among the soldiers, relief will proceed as arranged.

IN THE FIRING LINE

On relieving the fire trenches, the men should make no noise, and rifles must be carried so that they do not show over the parapet. This is necessary even if enemy's trenches are at a distance, as there is always the possibility of a listening or observation post being quite near.

Each man should pair off with one of the party occupying the trench and find out from him any points which may be useful.

A commander should consult the officer or N. C. O. in charge of the outgoing party and obtain the fullest information possible in connection with the position.

Particular points on which information should be obtained from the outgoing officer are generally: (a) behavior of enemy during period preceding relief and any point in their line requiring special information, such as enemy may have cut wire as though preparing to attack; (b) machine gun placement may be suspected at some particular point; (c) anything ascertained by patrols about ground between firing lines, thus avoiding unnecessary reconnoissance; (d) any standing arrangement for patrols at night, including point at which

wire can best be passed, ground to be patrolled, or place where they can lie under cover; (e) any parts of trench from which it is not safe to fire. Such positions are apt to occur in winding trenches, and are not always recognizable in the dark; (f) special features of trench, recent improvements, work not completed, dangerous points (on which enemy machine guns are trained at night), useful loopholes for observation; (g) places from which wood and water can be safely obtained; (h) amount of ammunition, number of picks, shovels and empty sandbags in that section of the line.

Information on these points cannot always be given by word of mouth. Written notes and plans should, therefore, be handed over to a platoon commander taking over for the first time.

In the meantime the incoming party should fix bayonets and all go temporarily on sentry at posts taken over. Occasional shots should be fired, so that the enemy's suspicions may not be roused. The outgoing party then starts back, and when clear, the relieving party should be numbered off and sentries posted and dug-outs allotted. When practicable sentries should be taken from the dugout closest to his post.

By day the number of sentries varies, but

should not be less than one in six. The platoon sergeant is responsible for changing sentries, who are generally not on duty more than one hour at a time, unless under exceptional circumstances. When the maximum amount of labor must be obtained from the battalion holding the line, sentry duty is of any length that fits in with working arrangements.

Every man must see that he has a good clear position for all directions. Section commanders must satisfy themselves that men have done this and reported such. When these arrangements are completed, word must be quietly passed down for men not on sentry to stand clear, and they are all not in that position again until the "Stand to" hours, generally the hour nearest dusk and the hour before dawn.

After dark, unless the moon is bright, rifles should be kept in a firing position on the parapet, and all men not on duty should keep rifles with bayonets fixed while in the trench.

OBSERVATION. Continuous survey of the enemy's lines through disguised steel loopholes should be made when the trenches are being held for any lengthy period, and such loopholes must always be sideways. Sites may be chosen by day, and made and disguised by night. Two steel loopholes about 3 yards apart

enable a man with leveled rifle to wait by one while another with field glasses watches for target through the other.

An observer watching persistently through glasses in complete security should make himself so familiar with the look of the opposite trenches as to enable him to observe any alteration in the enemy's wire entanglements, or notice immediately if a new sap has been run out from the enemy trenches under cover of night. He should watch points suspected of being machine gun placements, and especially at night when the flashes can be detected. Observers should be told what marks, etc., to look for on men exposing themselves, and any result of these observations at once reported to the officer or N. C. O.

INSPECTION. A platoon commander should make frequent examination of trenches; at least once daily, go around with platoon sergeant and section commanders and decide on the necessary work to be done. Section commanders are responsible for carrying it out.

Before handing over a trench, a platoon commander should make a rigorous inspection to see that it is as clean as possible and that latrines are left in a satisfactory state. This includes the removal of old tins, paper, scraps

of food, etc., which should be buried or burned, if possible. Empty cartridges should also always be kept cleared out, as they get imbedded in trench floors and hinder subsequent digging.

SENTRIES

If the enemy is close, sentries should be supplied with a small periscope to fix on sticks or bayonets. Magazines must be kept as full as possible. Sentries are not allowed to look over the parapet by day, but by night they must keep a continuous lookout. Shots should be fired even when no lights are showing, on the chance of catching hostile patrols or working parties. The best time to watch across No Man's Land is exactly the minute that the enemy send up a Very light, as there is little danger of one being seen, the real danger coming when the Very light is coming down behind you. Sentries should not reply to bursts of rapid fire on the right or left, unless they have a definite object to fire at.

Arrangements are usually made for commanders of two or three neighboring platoons to divide the night between 10 P. M. and the time for "Standing to" between them.

The platoon commander on duty in each watch should patrol the line constantly and satisfy himself that the proper number of sentries are on duty and keeping a sufficient look-out; also that they have good firing positions. In each platoon the sergeant and section commanders keep watch similarly in turns during the night, and are responsible for the relief of sentries. They also visit sentries every hour.

It is a rule which must be strongly enforced, that every sentry must challenge each person passing him, as it has often happened that enemy officers with more daring than common sense and speaking fluent English, have come into the trenches and walked up and down without being molested, which was only made possible by sentries not challenging every one passing his post.

RIFLES

Rifles should be inspected every morning in the trenches by the platoon commander, and at other times during the day by the sergeant or section commander, and it should be impressed on the men that ammunition must be kept clean or the rifles are apt to jam.

The principal defects of a rifle in the trenches are:

(a) Mud in the bolt, owing to rifle being rested on wet parapet or dropped on wet ground. To remedy this a bolt cover is used, or when not obtainable, an old sock pulled over the bolt action gives the desired result:

(b) Muddy ammunition, resulting in mud in chamber. Remedy: Prohibit placing of ammunition on ground and provide proper boxes for it.

(c) Mud in muzzle resulting from rifles being pushed into the sides of the trench. Remedy: Careful and frequent inspection. Rifle barrels must be freed from mud before firing, or they will be injured.

(d) Sticking of cartridges owing to dirt in chamber and magazine. Remedy: The keeping clean of both.

(e) Rust in the lock and insufficient oiling. Remedy: Bolt and magazine tested daily. Cartridges never to be kept in the chamber.

It is a standard rule that never from the time men enter the trenches until they go out, regardless of what they are doing, does their equipment come off, not even to lie down to sleep. During working periods which take the

men to the trenches, their equipment and rifles must always be carried with them.

PREPARATORY TO ENTERING TRENCHES

Things to be taken note of before entering:

(a) Check periscopes, wire cutters, field glasses, water carriers, stretchers, field dressings, emergency rations, smoke helmets, rifles, identity discs, sandbags, ammunition.

(b) See that water bottles are filled.

(c) Each officer to have an orderly.

(d) Magazines to be charged and bayonets fixed and unfixed beforehand to insure proper working. When taking over the trenches, the first thing to be done is:

(a) Ascertain position of officers' dugouts.

(b) Arrange telephones.

(c) Check stores, tools, and reserve ammunition, and its position.

(d) Obtain rough sketch of front and number of traverses to be manned.

(e) See that entanglements in front of trenches are absolutely intact.

(f) Arrange for water and ration parties and find out position of latrines.

TAKING OVER TRENCHES

On arrival each sentry is to have a periscope, the whole company to stand at arms, and each platoon to have its own ammunition reserve and all men know where this is. It is of the greatest importance that every detail and portion of trench taken over be known, and also the adjoining trenches as far as they affect the trenches held. Accurate sketches of the trench should be made, and periscopes, prismatic compasses and ruled notebooks are required. General scale is roughly $\frac{1}{4}$ inch to 10 yards. Drains must be watched and every effort made to keep trenches dry. When large trench mortar batteries of the enemy are active, men must be told off to watch for these bombs, as they are easily seen, and many casualties may be prevented by timely warning of their coming.

The fire trenches should contain as few men as possible, and work should be done at night, the men resting by day.

SNIPING

Each company generally has specially selected men told off as snipers. Strict discipline

is necessary. They are generally on duty by day and excused from night work, and it is the rule that they are either told off to a definite post or given what is known as a roving commission. These men must be expert in building loopholes of all kinds by day or night, use of telescopic sights, periscopes, etc., the selection and judging of good sniping positions, either for use in front or behind fire trenches; expert in judging distances, in aiming and trigger pressing, in laying fixed rifles for night firing, and in the fixing and laying of rifle batteries.

PATROLS

Patrolling both day and night is of great importance, and generally during the night each unit holding a front line sends out several small patrols which frequently obtain information of great value and at the same time counter the enemy's efforts in this direction.

These patrols generally consist of an officer and four to six men, according to the job in view. Sometimes on highly important work, it is three officers and sufficient orderlies to carry any valuable information obtained quickly back to a pre-arranged headquarters.

Bombs, revolvers and trench daggers are the only weapons of any value on these patrols. They frequently carry out small operations, such as raiding parties, cutting out parties, etc., obtaining from prisoners taken in this way information as to what enemy troops are opposing them in the line.

When a patrol is out every man in the section of firing line concerned must be warned, as well as the listening posts, and this cannot be done too carefully. It is not a sufficient warning to tell the sentry on duty at the time a patrol goes out, as men cannot all be trusted to pass on instructions, and generally word is quietly passed down the line by an N. C. O. or officer in person, and never passed from man to man. At the same time care must be taken to see that all firing does not cease, as this is undesirable, obviously arousing the enemy's suspicions that something is going on. When these patrols have to lie out in trying conditions during winter months, special dugouts should be kept ready for them on their return.

DUTIES OF AN OFFICER

Some of the questions an officer should ask himself on taking over a trench and keep in mind during his stay there, are:

1. I am here for two purposes—to do as much damage as possible to the enemy and to hold my part of the line at all costs. Am I doing everything possible to insure my being able to do this?

2. Do I worry the enemy as much as I might, and are the periscope rifles, rifle grenades, catapults and patrols at my disposal organized in the best way to effect this purpose?

3. Am I doing all I can to make my part of the line as strong as possible?

4. Should the enemy succeed in getting into any part of my line, will I be able to at once bring up a section of bombers for immediate counter-attack?

5. Do I connect properly with units on my right and left? Do I know the position of the nearest support, and the position of all machine guns in my vicinity, as well as their lines of fire?

6. Does every man know his firing position,

and can he fire from it over the parapet at the foot of our wire?

7. Do I do my best to prevent men exposing themselves needlessly? Have I ascertained and warned all my men of the places in my part of the line, including communication trenches, which are exposed to the fire of hostile snipers?

8. Are my sentries in the right places? Are they properly posted by N. C. O.'s and have they received proper instructions? Are the sentries visited at frequent intervals?

9. Have I always got a man ready to take messages to company headquarters? Do I realize that I should at once report any information I may obtain about the enemy, and that such information may be of the greatest use to the highest commanders?

10. Do all my men know their duties in case of attack, especially the bombers? If the enemy succeeds in working into my line at any point, how can I best arrange for counter-attacking him?

11. Are there any suitable places in my part of the line which snipers can use? Have I pointed out to section commanders the portions of the enemy's trench which each one is responsible for keeping under fire, and where the enemy's loopholes are?

12. Do I thoroughly understand the best method of relief and bringing up of ration and water supplies, and do my men come up into the trenches in absolute silence?

13. Do my men know their way about the trenches in various routes to company and battalion headquarters?

14. Am I acquainted with the arrangements for access to the artillery and for asking, if necessary, for their immediate support? Do I know the location of the nearest telephone?

15. Am I doing my best to collect information about the enemy, his defenses, his activities and movements, and especially about his patrols at night? What points in my front particularly require patrolling?

16. Are my listening patrols properly detailed?

17. Which is my best way to get through the parapet in order to go towards the enemy?

18. Do I know the last order regarding the use of S. O. S., gas and Zeppelin messages, and do I know exactly what messages to send?

19. Are the arrangements in case of gas attack complete and known to all ranks? Do I know the gong position, and does the sentry know the orders as to sounding it?

20. Have my men always got their gas hel-

ments on their person and are they in good order?

21. Are my parapets and traverses bullet-proof everywhere?

22. Is my wire strong enough and am I doing all I can to prevent my trenches from falling in?

23. Am I doing all I can to drain my trenches?

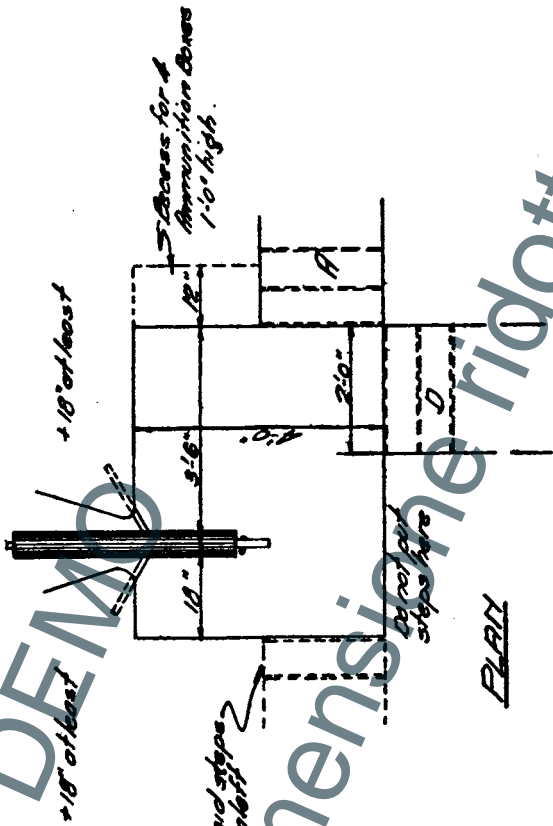
24. Have my men got weather-proof places to sleep in?

25. Are the trenches as clean and sanitary as they might be? Are live ammunition and empty shells properly collected? Have I made all possible arrangements for the collection of refuse and do the men realize that it must not be thrown over the parapets or in the sump-pits for sanitary reasons?

26. Where are my small ammunition and bomb stores, and are they under cover from weather?

27. Are all my rifles and ammunition clean and in good order, and have all my men rifle covers? Are their magazines always charged?

28. Am I doing all I can to prevent my men from getting trench feet? Have my men greased their feet before entering the trenches, and have they a pair of spare dry socks to

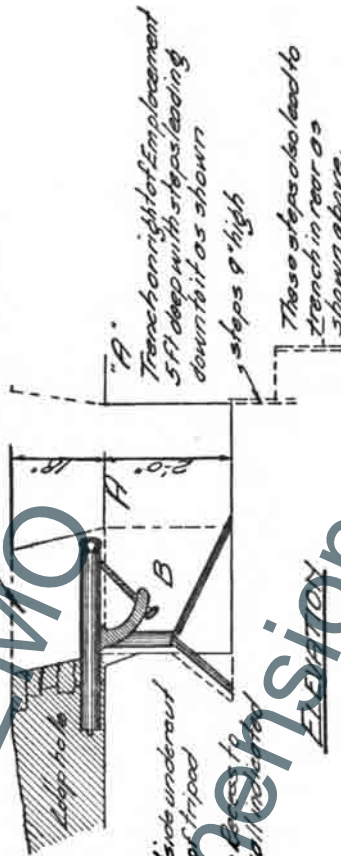


PLAN

DEMO
 dimensioni ridotta

DEMO

Send box or sand
right of emplacement



Support side undercut
for legs of tripod
Ammunition boxes to
be made in wall indicated
at B.

Trench on right of Emplacement
5 Ft deep with steps leading
down to it as shown

steps 9" high

These steps also lead to
trench in rear as
shown above.

MACHINE GUN EMPLACEMENT

A type of front line emplacement with which an infantry officer should be familiar, but which are constructed by and are entirely under the control of Machine Gun Companies.

change? Do my men wear gum boots when it is not necessary? Have I made all possible arrangements for drying socks?

29. Are the orders as to wearing equipment carried out?

30. Are my men using as firewood notice boards or wood from the defense or from the engineer or trench stores?

31. Are my men drinking water from any but authorized sources?

32. Do I know the name of every N. C. O. and man in my platoon, and do they know mine?

33. Do I insure that my men get sufficient sleep?

34. Have I sufficient periscopes and are they in good order?

35. Almost always remember that I am here for two purposes. Do as much damage to the enemy with the minimum amount of casualties resulting from retaliation, and to hold my part of the line at all costs.

HOW TO FIRE A MACHINE GUN IN CASE OF EMERGENCY

As a machine gun textbook is very dry, and it is difficult for a man who is not of a mechani-

cal turn of mind to obtain the most elementary knowledge of the action from a book, officers should lose no time in getting in touch with a machine gun officer and learn from actual experience, how to load, fire and rectify simple stoppage.

LEWIS GUN. To load, put a full magazine on the magazine post with the cocking handle forward.

Pull back cocking handle to its fullest extent, and raise tangent sight unless the target is within 200 yards.

To fire, press the trigger and the gun will continue to fire as long as pressure on the trigger is maintained. It will only stop when (a) the magazine is emptied; (b) stoppage is set up. To remedy this (1) take off empty magazine and put on full one, reload relay and fire; (2) cocking handle stops in one of three positions. To remedy this one must have a thorough knowledge of remedying of stoppages.

VICKER'S AUTOMATIC. To load, pass the brass tack of belt through feed plug (right to left), pull back crank handle and pull belt to the left; release handle and belt; repeat this process and the gun is loaded. Vertical adjustment for sighting is obtained by moving elevating wheel on quadrant of tripod, horizontal adjustment

by tapping the rear cross-piece. The clamping handle is in front of the cross-band of the tripod. To fire, raise safety catch with first or second finger (the safety catch is a strip of steel which is under the thumb-piece or double button) and press the thumb-piece. The gun will now fire until pressure is released or until a stoppage occurs.

STOPPAGES. There are four common stoppages, distinguished by the position of the crank handle. Remedy: (1) Pull crank handle back and belt to the left, let go crank handle; (2) open rear cover, take out lock, remove bent cartridge from face of lock; (3) hit crank handle down. If it will not go, lift it a little, pull belt and hit again; (4) raise crank handle, pull belt, let go of crank. If not effective, then put in the spare lock, but unload first. To disable gun, remove lock and fuse from fire belt through the breech casing.

PREVENTION OF FROST BITE AND TRENCH FEET

These conditions are generally caused by long standing in cold water and mud, or the continuous wearing of wet socks, boots and put-

tees, and the conditions are accelerated when the blood circulation in the feet and legs is interfered with by the use of tight puttees, or anything calculated to cause constriction of the lower limbs. They can be prevented or diminished by constant improvement of trenches and reducing the time spent in the trenches as far as the general situation will permit by battalion arrangements; by insuring that men entering the trenches are warmly clad in dry boots, socks, trousers and puttees, and that before entering, the men's legs and feet are thoroughly rubbed with whale oil. Provisions are made for the men on coming out of the trenches to get warm shelters, hot foods and facilities for washing the feet and drying wet clothes, and all along the line just behind the trenches soup kitchens are kept where the men may stop on the way to billet and get hot soup, etc.

The arrangements made when a battalion is going into the trenches are roughly as follows:

The men's feet and legs are washed and dried and then thoroughly rubbed with whale oil and dry socks put on. A second pair of dry socks is carried by each man, and when it is possible, battalion arrangements are made for wet socks to be brought down from the trenches one night and dry ones exchanged, this taking place every

night. This is generally managed by the men changing in the early morning, the relief party for that night taking down the wet socks and bringing in the dry for the next morning.

Hot water must never be used, nor the feet held near a fire. Where necessary, and circumstances permit, long gum boots are put on on entering the trench, while the men's feet are still dry, and taken off as soon as they prepare to leave and handed over as trench stores.

In some parts of the line, where conditions are very favorable, battalion rest posts are formed as close to the firing line as permissible, and men showing signs of suffering from exposure are frequently attended to.