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C.D.S. 82.

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Ia/0062.

(Translation of a German Document.)

### INSTRUCTIONS REGARDING THE CONSTRUCTION OF TRENCHES AND SHELTERS.

*Deep and narrow fire trenches* afford the best protection, particularly against artillery fire. As a general rule, fire trenches should be constructed for fire standing. If time permits, they can be improved so as to permit of movement under cover behind the firing line. The height over which a man can fire standing is about 4 feet 7 inches, of which 3 feet 7 inches should be provided by the trench and 1 foot by the parapet. This type of trench should be 3 feet 3 inches wide at the top, and must be so constructed that the width at the bottom is at least 2 feet (see Fig. 1).

*The improved fire trench* is actually nothing more than a combination of an ordinary fire trench with a so-called lateral communication trench (*Verkehrsg Graben*). This latter trench should be constructed with a width of 2 feet at the bottom, and should be 16 inches deeper than the fire trench, so that it provides 5 feet 11 inches of cover to anyone passing along it (see Fig. 2).

*Trenches without parapet* can be constructed where the ground permits, but should be employed only if the excavated earth can be removed to some place where it is not visible to the enemy, e.g., to a natural depression in rear of the trench (see Fig. 3).

*Parados*, constructed with surplus earth, for protection against back bursts of shell, must not be higher than the front parapet, and must be made equally invisible.

*Traverses* should be provided. They afford protection against oblique and enfilade fire, and against the lateral effect of shell bursts and hand grenades.

*Cover trenches* must not be less than 50 metres behind the fire trenches. They must be organized for defence like the latter. They should be provided with shelters and bomb-proofs for troops not engaged in the firing line and for their commander (see Fig. 4).

*Communication trenches* must be provided between the fire trenches and the cover trenches, and from the latter to natural cover provided by folds in the ground. They should be made 4 feet 11 inches deep, and 3 feet 3 inches wide at the top and 2 feet at the bottom. They must be provided on either side with a

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parapet 1 foot high, so as to afford 5 foot 11 inches of cover (see Fig. 9).

Experience gained by the troops during the trench warfare in the East has led to further developments, and has caused the introduction of trenches which show considerable variation from the usual types.

Fire trenches, for instance, should never be constructed without a continuous recess. The simplest type is shown in Fig. 6. A narrow, deep trench with a low, flat parapet requires very little digging and is easily concealed. A man sitting on the low step below the parapet is well covered; he must stand on the side of the trench behind the step when he wishes to use his rifle.

The overhead cover, which is supported by four baulks laid across the trench, and by the traverses, can be quickly and easily constructed and requires but little material. There should be a sent in the centre of each bay in order to prevent the whole structure from being brought down by one direct hit. The space between the two centre baulks, which are 2 feet 8 inches apart, is for the group leader with two men in each of the spaces on either side of him (see Fig. 8).

A small parapet should be provided to give protection against splinters; screens are unnecessary, and would only cause inconvenience. Trust screens may be nailed up as a protection against weather.

Trenches are not possible in such a trench: it is necessary to construct a special trench, narrow and if possible 5 feet 11 inches deep, about 12 feet in rear, for lateral communication. This should be connected with the fire trench at every alternate traverse. In order to reduce the effect of splinters, it should be slightly staggered between the short lengths of trench which connect it to the fire trench. The short lengths should be dug to the same depth as the lateral communication trench and may with advantage be partially or entirely blinded, especially if the ground slopes down towards the front. The trench round the traverse should be excavated down to the level of the lateral communication trench. A few small latrines (four per company) should be made branching off from the rear-entrance of the lateral communication trench. Looking trenches should also be arranged. Numerous steps or short ramps should be constructed to facilitate entrance into the trench (see Fig. 10).

The trench shown in Fig. 7 is more comfortable and affords better cover, but it involves more labor and material.

If time be available, more freedom of movement can be obtained in the trench shown in Fig. 6 if the supporting baulks overhead cover are shortened, as shown in Fig. 9, and are situated along the rear edge. This arrangement would obviate the necessity of a special lateral communication trench, and is desirable when the ground is difficult to excavate. Similarly, the trench shown in Fig. 7, the rear portion of the supporting baulks may be displaced with.

If time permits, a small dog-out, about 6 feet 6 inches wide by

6.2 feet deep, should be constructed underneath the parapet in every other space, and also one officer's dog-out, per company in rear of the lateral communication trench; this dog-out should be of at least the dimensions given, above, and should have an entrance leading into it from the lateral communication trench. These dog-outs should, if possible, be rendered rain proof by means of roofing felt (see Fig. 10).

Extensive use has been made of fire trenches protected against splinters; it is often desirable to cover them in completely, even towards the rear. This is particularly the case where it is difficult to support the line by artillery fire, but where a good volume of rifle fire, even under hostile artillery fire, is essential; it is also desirable where the unfavorable nature of the ground necessitates an increase in the passive defensive power of the trenches, and especially where the trenches, either owing to the nature of their site or on account of the ground, cannot be protected or are insufficiently protected against the enemy's indirect artillery fire.

Figs. 11, 12, 13 and 14 represent the types which experience has shown to be the most efficient. Generally speaking, wide latrines are to be preferred in these trenches. They are more easily constructed, afford a better view and a wider field of fire, and with the help of brushwood, vegetation, etc., are as easily and sometimes more easily concealed than ordinary latrines.

Fig. 15 shows an arrangement which permits of men firing standing and men firing lying down simultaneously. The lying-down portion can also be used for sleeping purposes.

Figs. 16 to 18 give examples of additions which can be made to trenches. The double overhead cover shown affords a certain amount of protection even against a direct hit, but it involves considerable labor and material.

It is essential that there should be covered communication trenches back to ground which affords cover from view; if these communication trenches enter a line of ground, they must either be taken round it or over the lowest part.

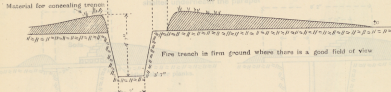
When the ground rises to the rear these communication trenches may have to be completely blinded in places.

Particular attention must be paid to concealment. From the experience gained in the Eastern Theatre it appears essential, firstly, that isolated fire trenches should not be apparent; communication trenches should be dug between them so that the line is continuous, and the enemy induced to distribute his artillery fire evenly along the whole front.

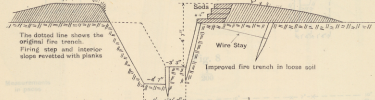
Secondly, in addition to making the parapets conform as far as possible to the form and appearance of their surroundings, it has been found advisable to keep the superior slopes very flat so that it merges gradually into the line itself. At the ends of sections gradually into the ground as slopes of about 1 in 20. The use of bushes and branches of trees, especially fir trees, will often assist concealment.

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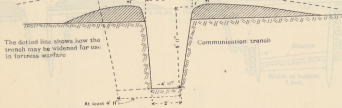
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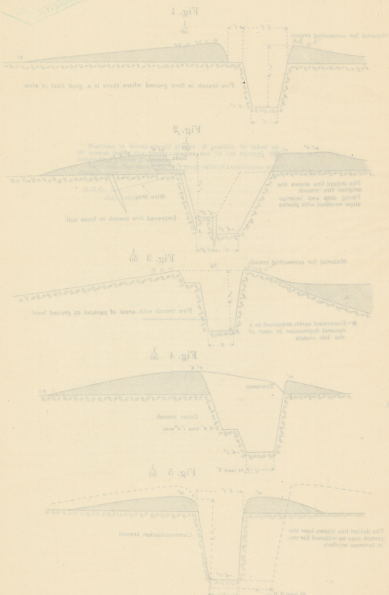


Fig. 6

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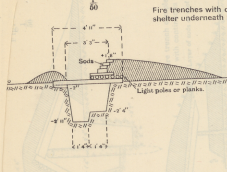


Fig. 7

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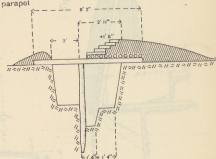


Fig. 8

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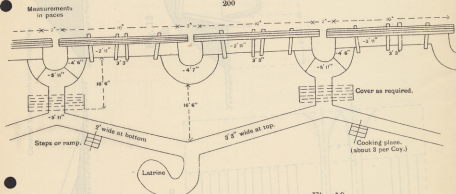


Fig. 9

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Improved Pattern of Fig. 6

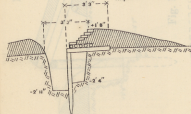
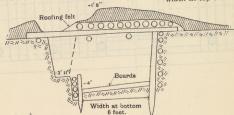


Fig. 10

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Shelter for 4 men lying down, width at top 8 feet.



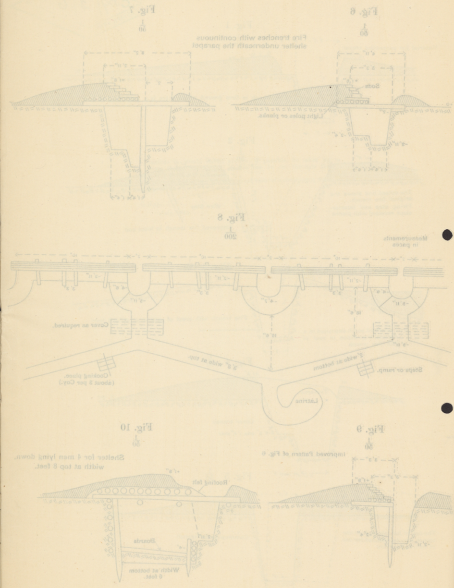


Fig. 11  
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Covered fire trench with loopholes.

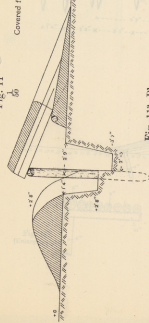


Fig. 12  
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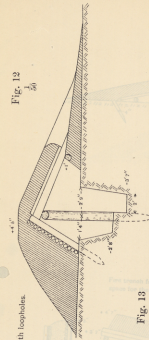


Fig. 13  
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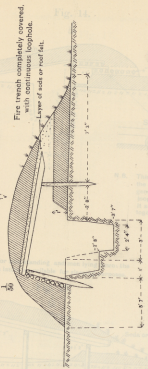


Fig. 11<sup>a</sup> Plan

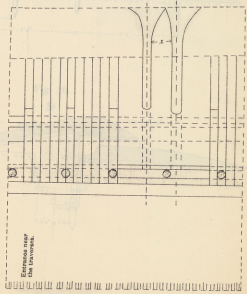
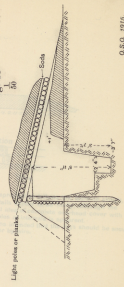


Fig. 13<sup>a</sup>  
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Fire trenches with complete overhead cover.

Fig. 17.

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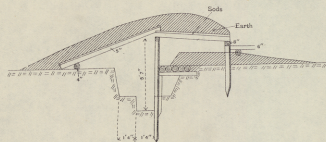
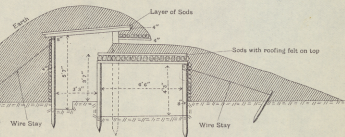


Fig. 18.

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Fire trenches with complete overhead cover.

Fig. 17.

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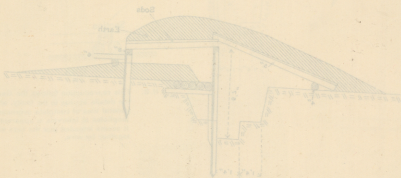


Fig. 18.

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