BOX 18
NUMBER

Field Artillery Notes
No. 5

From the latest information furnished by British and French sources, including reprints of official circulars

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EDITED AT THE ARMY WAR COLLEGE
WASHINGTON, D. C.

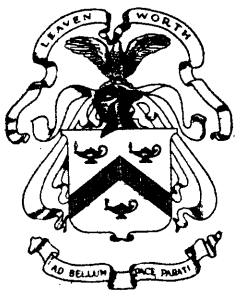
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FIELD ARTILLERY NOTES NO. 5.

WAR DEPARTMENT,
WASHINGTON, *June 27, 1917.*

The following Field Artillery Notes No. 5 are published for the information of all concerned.

BY ORDER OF THE SECRETARY OF WAR:

TASKER H. BLISS,
Major General, Acting Chief of Staff.

OFFICIAL:
H. P. McCAIN,
The Adjutant General.

CATECHISM FOR FIELD ARTILLERY SUBALTERNS.

PURPOSE.

As an officer in the Field Artillery you are required to have an extensive knowledge of a number of subjects. On the action you take, due to your knowledge of these subjects, will depend the accurate shooting of your battery and the lives of your men.

This pamphlet consists largely of questions which, if you are an efficient officer, you will be able conscientiously to answer satisfactorily. If you can not answer them, you are not efficient, which means that you may be responsible for the lives of infantry, whom it is the whole of your work to assist, to say nothing of the lives of your own men.

Take the necessary steps immediately, therefore, to be able to give satisfactory answers to those questions which you can not answer at present.

I. GENERAL.

1. When your battery takes up a new position, do you make every effort to get your guns into action, lines of fire laid out, and the battery connected to an observing station or another battery which could observe for you, as soon as possible, so that you can take part in event of a sudden attack?

2. Are you careful that all tracks and conspicuous objects are cleared away before hostile air scouts can see them?

3. Do you set about making rough dugouts for the men immediately?

4. Can you get a round off on your night lines inside two minutes from receiving the order, day or night?

5. Can you get a round off on to any target in your arc inside five minutes, day or night?

6. Do you take advantage immediately of any fleeting opportunity?

7. Are you careful to keep your personnel in touch with any change in the situation as soon as possible?

II. THEORETICAL GUNNERY.

1. Why is a recoil mechanism necessary?
2. Why do you need to calculate angle of site?
3. What is the actual effect of making a mistake of 10 mils in the angle of site at a range of 6,000 yards with your gun?
4. If shrapnel is used, what is the effect of a graze burst and of a very high burst?
5. What is the effect on range of a low air temperature, a high-charge temperature, or a high barometer, and why?
6. What is "drift"?

III. PRACTICAL GUNNERY.

(The majority of this applies particularly to platoon commanders.)

1. Have you got copies of handbook, drill book, and range table for your weapon?
2. Could you have any weapon taken completely to pieces and assemble it again?
3. If it is necessary to replace damaged parts, could you show your men how to do it, if they did not know?

How long would it take you to replace the different parts of your gun or howitzer that are liable to be damaged or go wrong?

4. What is the weight of your shell, the weight of the charge (or charges)? What do the marks on your shell mean?
5. What fuzes do you use?
6. What precautions do you take to keep your ammunition in good condition? Charges and fuses must be kept dry and, as far as possible, at a uniform temperature. Projectiles must be kept dry, clean, and off the ground.
7. Do you arrange your charges and time fuzes into lots and your projectiles into groups, according to their weight?
8. Do you take precautions to use up the old ammunition in the pits before that which is dumped when you fill up?
9. Do you know how much ammunition is in your pits at this moment, and how long it would last you in event of an attack?

10. Do you know how long it takes for fresh ammunition to come up during an attack, when the roads will be crowded and possibly under shell fire? Accordingly, do you know how long you could maintain a definite rate of fire before you ought to send for more ammunition?

11. Have you a definite plan for the replenishment of ammunition, so that the wagons know where to drive to and the men know where to put the ammunition when they unload it?

12. Do you know the aiming points used by your guns?

13. Do you keep a board fixed in the gun pit detailing the aiming point and different angles, elevations, fuzes, charges, etc., for your principal target and defense lines?

14. Could you at this moment go and lay your gun yourself on some point wtihin your range and arc?

15. Is your arc of fire as large as possible?

16. Could you determine the map position of your battery in an area of country you did not know?

17. How would you lay out the original line of fire in the following cases:

(*a*) Where there are plenty of aiming points and you know your map position.

(*b*) Where there is no suitable aiming point and you know your map position.

(*c*) Where there is no suitable aiming point and you don't know your map position.

18. What is the effect, if you have got your battery position plotted 300 yards northwest of your true position, when you switch from one target to another?

19. Are you certain at the present moment that your sights, clinometer, etc., are in accurate adjustment? Do you frequently test this personally?

20. Are you certain at the present moment that the bores of your guns are absolutely clean, and all working parts in good adjustment and well oiled, and all unpainted parts polished? Do you personally examine the working parts of your guns to see that there is no dirt in them?

21. Do you realize the damage that can be done to the bore by a gun being left loaded for some hours after it has been fired several times, and is accordingly coated with corroding substances?

22. Do you turn your wheels daily, so as to change the working spoke?

23. Have you got a map board for your battery position? Is the map of the latest edition? The coordinates of points and trenches vary considerably on different editions.

24. Do you occasionally check your map to see that it has not stretched and is giving you wrong map ranges?

25. Are you deficient of any stores, particularly the new ones not in equipment manuals?

26. If you have emplacements, are they whitewashed inside? Are all the tools necessary hung up neatly in the gun pit? Are the box respirators handy?

27. Do you frequently look to see that your buffers are full and your springs and parting plates in good condition? Do not leave this to the chief mechanic.

28. Do you frequently watch your guns while they are firing to see that the recoil and return are normal?

29. If you suspect anything wrong with your guns, do you request that an ordnance officer shall examine them?

30. Do your aeroplane lookouts know their job? Do you arrange for them to go to neighboring anti-aircraft batteries occasionally in order to learn new types of hostile aircraft?

IV. OBSERVATION.

1. Do you know the details of the enemy country your battery is shooting over? Can you name all the prominent points that can be seen from your observing station?

2. Do you know exactly where our front line is?

3. Do you understand "contours" and can you determine from them what ground should or should not be visible from your observing station?

4. Do you visit other Field Artillery observing stations and study the country from a different point of view?

5. Have you got a properly mounted map at your station with an arc of view on it?

6. Do you continually instruct all your observation party in knowledge of the country? As this knowledge depends on a purely personal factor, viz, "eye for country," you will generally find that there are several men in the battery who are better at spotting shell bursts, working parties, gun flashes, etc., than you are. Do you make all the use of these men you can?

7. Do you thoroughly appreciate the fact that, whoever is watching from the battery observing station, be it the battery

commander or member of the party, is nominally commanding the battery, and must call it into action instantly if necessary, get it shooting, and then make his report?

8. If you see a target out of your arc, do you know whom to call up to engage it, and how long it takes them to commence firing?

9. Have you an angle-measuring instrument at your station?

10. Do you check the variation of your prismatic compass?

11. Is your observing station constructed on one of the following principles?

(*a*) Overhead cover proof against 5.9-inch, with telephonists' dugout proof against 8-inch.

(*b*) Overhead cover just proof against shrapnel with a 5.9-inch proof dugout into which the observer can slip instantly. Telephonists' dugout proof against 8-inch.

The former used where there is natural concealment, or where concealment is not necessary, and the latter where concealment is essential.

12. Do you inspect your station each day to see that the telephonists' dugout is kept clean? Telephonists at observing stations are inclined to acquire dirty habits.

13. Do you make a point of learning some more country from the map each time you are up at the observing station?

14. Have you a general knowledge of country both sides of the area your battery shoots over?

15. Do you know all depressions or other places within reach of your battery where the enemy could assemble unobserved?

16. Do you know what rocket signals are used on the front within your arc of fire, and what they mean?

V. RANGING.

1. Can you adjust your battery quickly on any point in your sector?

2. Do you know what change of range or deflection an arc of 100 mils represents when looking from your station on different parts of your sector?

3. Do you employ a stop watch when ranging, so that you can pick out your own shell if more than one battery is engaging the same target?

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4. Can all your observation party carry on ranging the battery in case you are a casualty?

5. Do you thoroughly understand the method of ranging with aeroplane observation?

VI. ACTION.

1. You may be confronted at any moment by an exigency such as a gas attack, a heavy bombardment of your battery, or even a rapid German advance.

2. In each of these cases what action would you take? Have you taken all the precautions necessary to insure that everyone knows what to do?

3. Do you understand the "gas precautions"; do you observe them fully; and do you frequently practice "gas drill"?

4. What will you do with casualties in the battery? Where is the nearest dressing station?

5. Assuming, if the enemy attacked on a large scale, that there was a severe preliminary bombardment followed by gas and a possible rapid advance, what action would you take? Fire would probably cut all your telephone lines, and you would thus have to act entirely on your own initiative. Have you means of laying and shifting if your normal aiming points are obscured by smoke?

6. If you are ordered to retire, do you know the position that is reserved for you to retire to, for each line of defense that we hold? Have you visited rear observing stations, from which our own rront system of trenches can be observed in case these should be occupied by the enemy? Do you know what arrangements are made for establishing communication with these stations?

7. If you had to take one of these positions, have you thought how you would get there, where you would dig dugouts, and where you would run your lines? Have you reconnoitered the route to the position? Can you make use of existing telephone lines?

VII. LIAISON.

1. Do you make friends with the infantry in front of you and ask them to your observing station and battery when you are firing? It is of the greatest importance to get the infantry to have absolute confidence in you and your shooting.

2. Do you go and visit other batteries and their stations, and thereby see any improvements they may have made?

3. Are you in close touch with the personnel of the aviation, balloon, engineer, topographical, signal, and supply services? All these people can help you with your work.

VIII. CAPABILITIES OF YOUR BATTERY.

1. What is your extreme range on a hot day with a 10 m. p. h. wind behind you, and on a cold day with a 30 m. p. h. wind against you?

2. What is your extreme rate of accurate fire? Do you rest your guns periodically when firing for long periods at a rapid rate? (The general rule is 10 minutes in every hour.) Have you got water, for cooling the guns, handy.

3. How many guns can you get on any particular place in your arc of fire?

4. What is the shortest range at which you can fire?

5. How long does it take you to get the first round off upon receiving a surprise order to fire?

6. How long would it take to get out of action if you were ordered to advance at this moment?

IX. TELEPHONY.

1. Can you buzz and read Morse fast enough to be of use?

2. Can you read and send semaphore?

3. Do you thoroughly understand the telephone, particularly the tests which show whether it is in proper working order?

4. Do you test the voltage of your cells frequently?

5. Is your equipment complete, both for visual signaling and telephony?

6. Are your lines in good order? Do you test to see whether bad speaking of lines is due to bad insulation or bad joints? (See Appendix I.)

7. Have you taken precautions that your linesmen are as little exposed to shell fire as possible? That is, by having test points in safe places and the route for the line laid out accordingly. You can not expect to keep your lines "through" under heavy shell fire, if your linesmen have to work all the time exposed to this fire.

8. Do you know exactly the route of each line? And do you periodically walk your lines?

9. Have you several alternate routes for communication and do you take every precaution to make your lines safe by burying them at least 6 feet? Do you realize how the use of insulators will save your air lines from deteriorating?

10. Do you understand your telephone exchange and do you know the calls for your different stations?

11. Are your buzzer calls carefully selected, so as to avoid clashing with those of neighboring units who are interconnected with you? Do you employ four letter calls where one letter is sufficient?

12. Do you pay strict attention to the orders with regard to using "earths" within the zone of "overhearing" by the enemy?

X. FIELD ENGINEERING.

1. You are often required to construct dugouts and gun emplacements which are weatherproof, shellproof, and, at the same time, proof against detection in aero photos taken by the enemy.

2. Can you construct a dugout and a gun emplacement which is proof against a 5.9-inch shell? Do you understand the advantages of a "bursting course" and "double roofing"? (See Appendix II.)

3. Do you make as much use as possible of cupolas?

4. When constructing a gun pit do you make certain that the roof is not higher than necessary? There is always a tendency to make the roof too high, thus adding height to the pit and making it conspicuous.

5. Do you fully realize how essential it is to have proper framework for your dugouts and gun emplacements when they are first constructed? It is very difficult and unsatisfactory to reinforce the supports afterwards. Are your supports more than 18 inches apart?

6. Are you careful to give ample support to the beams or girders you use for framework? It is little use to employ heavy girders if you only support them for 2 inches at each end.

When building up sandbags on a trench, or excavation, are you careful to leave a ledge so that when the earth crumbles

away your sandbags will not collapse for want of support? Do you make the use of timber that gives its greatest strength? Are the entrances to your dugouts very strong, and do they face away from the direction of hostile shell fire? Have you two entrances for each man's dugout?

7. Before constructing dugouts, etc., do you go to see neighboring batteries (particularly those who have had winter experience in the area) and find out what they recommend? Have you studied the designs for gun pits issued?

8. Have you studied the drainage problem of your battery position?

9. Do you take every precaution to make the dugouts, etc., weatherproof? Will the roof leak? Will water get into the dugouts through the entrance? If water does get in, is there a large sump? (The ideal floor is cement, drained toward a deep sump and covered with high trench boards; or in chalk, the trench boards are sufficient, provided the floor is kept free from mud which blocks the natural drainage.)

10. Do you realize how easily battery positions can be detected on aero photos from (*a*) shadows thrown by the outward form of the dugout and emplacement, (*b*) tracks leading about the battery, (*c*) the blast from the guns on the ground in front of the pits? Do you take precaution against these?

11. Do you endeavor to mislead the enemy as to your position by (*a*) a not too obvious dummy position two or three hundred yards away with an artificial blast in front of the guns, (*b*) artificial tracks in front of your battery position?

12. Have you had an aero photo taken of your battery position?

13. Are your telephonists' dugout and your B. C.'s dugout really well constructed and shellproof, and is there ample room for the detachments in their dugouts?

14. Are your detachment dugouts so placed that the men can man their guns in the least possible time?

15. Have you got a good road up to the vicinity of the position along which wagons may drive for replenishment of ammunition, etc.? Wheel tracks up to the position must be avoided; if there is not a good road these tracks are inevitable.

16. Do you make use of speaking tubes?

XI. ROUTINE, DISCIPLINE, AND COMFORT.

1. At what time in the morning are your men clean and shaved? At what time is the battery position absolutely clean and tidy?

2. Do you hold frequent kit inspection to see that the men's equipment is complete and in good order?

3. Do you know how much pay each of your men gets and whether their dependents are receiving their full allotment?

4. Do all your men wear identification tags and carry first-aid dressings?

5. Do you know who are the men to trust in your section; who are worth promoting; who are lazy; and who are slackers and malingerers?

6. Can you trust all your noncommissioned officers? Can your senior noncommissioned officers take your place if you are a casualty? If they can not, are you training them?

7. Are the cooking arrangements satisfactory? Do your men get the rations cooked as they like them? Do you arrange that they can purchase any luxuries they want from exchanges?

8. Do your men do a full day's work? Do you keep fairly short hours but have your men working really hard at every job they do?

9. Do you appreciate that men will not work hard when they are required to do so if they are continually permitted to slack?

10. Do you appreciate that men can not continually do more than six-hour shifts per day, for really hard physical work or mental work such as telephone exchanges?

A normal day's work for any man should be 12 hours, of which 6 may be as above.

11. Do you see that your men get recreation in the form of baseball and other sports?

12. Do you appreciate how much competition improves the standard of work by giving the men a sporting interest in their work?

13. Do you frequently hold small classes in laying, telephony, etc.? Do you occasionally have gun drill with buglers, mechanics, cooks, telephonists, etc., taking cannoneers' numbers, giving the junior noncommissioned officers a chance of practicing the duties of chief of section?

14. Do your men do their work at double time? Is their gun drill smart? Do they spring to attention when spoken to by an officer?

15. Do they appreciate how much external appearance coincides with internal efficiency?

16. Do your men firmly believe that theirs is the best battery in France, and have they a right to this belief?

XII. HYGIENE.

1. Are your latrines properly situated and in good condition?

2. Is your cookhouse well constructed and absolutely clean?

3. Where do you get your water from? Have you had it tested?

4. Do you take precautions that the water is boiled before being drunk, unless you know it to be certified as drinkable?

5. Can your men get a hot bath, clean shirt and drawers once a week? Also clean and dry socks as required? Is there a battery barber?

XIII. STABLE MANAGEMENT.

(For horse-drawn batteries.)

1. Do you know what your horses' forage ration is and do you see that they get full weight? Do you know good oats or hay from bad oats or hay?

2. Do you attend "Stables" as often as possible, and, if in charge, do you see that the grooming, watering, and feeding are well regulated?

3. Do you see that your horses are in good condition and comfortable—i. e., that their shelters are good and water-tight; that there are no draughts of cold air; that the standings are in good order and out of the mud and water; that the horse covers and nosebags are kept in good order?

4. Do you examine each horse at stable hour to see that he is clean, free from vermin, and, particularly, that his feet and heels are in good condition?

5. Do you understand the shoeing of horses, and do you see that your horses are properly shod; that spare shoes are in their proper place; and that the horseshoers' tool bags are properly equipped?

6. Do you know the various grains and seeds which can be used for fodder in the absence of oats, equivalent amounts, and their effects?

7. Have you seen whether the entrances to your horse lines are well metalled and dry, and that the approaches to and surroundings of water troughs are similarly treated?

8. Do you understand the symptoms and cure of simple ailments, and has your battery instructions regarding the prevention of the spread of infectious diseases, such as mange?

9. Do you know who your veterinarian is and where he can be found? Do you know what the farrier's equipment is, what the articles are for, and where they can be found?

10. If horses are out late at night, have you a noncommissioned officer detailed to see them come in and properly cared for at once?

11. Do you inspect your harness frequently to see—

(*a*) That the leather work is well cleaned and oiled, and especially that working parts, such as breast collars, girths, sweat flaps, are kept soft and pliable?

(*b*) That the steelwork is thoroughly cleaned and then rubbed lightly over with clean oil?

(*c*) That every article of harness fits its wearer properly, as laid down?

12. Have you got good cover for your harness? Is the cover large enough to enable the drivers to clean their harness under shelter?

13. Do you ever inspect the drivers' "kits," and do you know what each should contain?

14. Do you inspect all battery vehicles frequently to see that nothing is wrong with them? "A stitch in time saves nine."

15. If on the march and a horse goes so sick that it has to be left behind, do you know what disposition you should make of it?

16. How often are your horses fed? "Little and often" should be your policy. Never less than three feeds a day, and preferably four or five; first feed as early as possible, and the last (and biggest) as late as possible.

17. Do you appreciate that in cold weather a cover is as good as an extra 2 pounds of oats?

18. Do you know the regulations re clipping, trimming, and plucking?

19. Do you realize how much a horse's condition depends on good water, and plenty of it? Always water from troughs if possible.

20. Do your men really work hard when grooming? Short stable hours and hard work while at it should be the rule.

21. Remember that the essence of horse mastership is the "master's eye."

XIV. MARCH DISCIPLINE.

1. Do you realize that good discipline or the reverse shows up more on the march than at any other time?

2. Do you and your drivers dismount as a matter of course when halted? Do you realize the importance of getting the weight off the horse's back on every possible opportunity? All mounted men, officers, included, should walk and lead at intervals.

3. Do you see that your men never slouch in the saddle?

4. When on the march do you supervise your command and not always ride at the head? See that your chiefs of section do the same. You should see that the horses are being properly kept up in draft, that harness is properly fitted (this often only becomes apparent when on the march), carriages not overloaded, the proper balance of the pole maintained (this can not be done if men are allowed to ride except in their places).

5. Do you see that your horses are watered and fed whenever possible on the march and that girths are slackened?

6. Do you realize that a horse can not drink its fill or even drink comfortably with a man sitting on its back? Or with a bit in its mouth?

7. Do you take severe action in all cases of illtreatment of horses?

APPENDIX I.

TESTING TELEPHONE LINES.

When a telephone line is first laid, the speaking is generally very good. This gradually deteriorates until the line becomes useless. The deterioration can be prevented if it is checked the moment it commences; but this presupposes that the cause is known and can be isolated. The tests explained hereunder are to isolate the cause.

The causes of deterioration are, firstly, increase in resistance of line due to rusty joints, etc.; secondly, increase in leakage due to insulation wearing off, etc.

The results of the tests below should be carried out daily and entered in a book, so that the linesmen can check any tendency to deterioration.

I. TEST FOR COMPARATIVE RESISTANCE OF LINE.

(See Diagram I.)

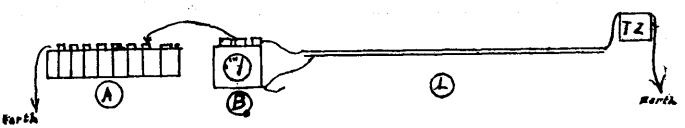
"A" is a battery of 10 dry cells.

"B" is a linesman's detector (part of British battery equipment).

"TZ" is the telephone at "Z" station.

"L" is the line to be tested.

DIAGRAM I



The operator warns "Z" that he is going to test and then disconnects the line from his phone and connects it to the detector. The other line from the detector is connected to the cells in series, increasing the voltage by one cell at a time until

a halfway deflection is obtained on the detector. The number of cells and the deflection is written down.

If, on subsequent tests, this deflection becomes decreased or more cells are required, the line resistance is increasing. A lineman must then thoroughly overhaul the line, having it tested frequently until the deflection increases to the old amount. The earth pins should be tested and watered to see if this is the cause of the increased resistance.

II. TO TEST FOR LEAKAGE.

The connections are very similar to the previous test except that all 10 cells must be connected up to the detector. Instead of leaving the phone connected up at "Z" it is disconnected and the bare end kept away from contact with anything. If there is no leakage there will be no deflection of the needle. Whatever deflection is obtained is a comparative figure for leakage. If this increases, the insulation of the line must be overhauled.

Both tests are equally important.

If the above explanation is not understood, get hold of a signal officer who will explain it to you.

APPENDIX II.

SHELL-PROOF COVER.

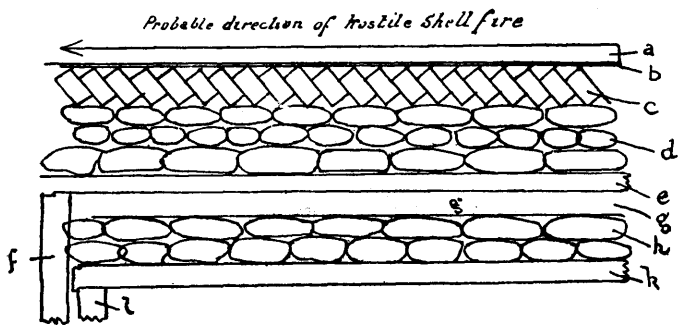
Practically no cover which can be constructed in a battery position is proof against the *penetration* of a heavy shell.

It is therefore necessary to cause it to burst before it has penetrated, and, if possible, to deflect it so that it will not tend to penetrate actually into the pit.

In constructing overhead cover a definite scheme must be adhered to.

The following is one example of many and illustrates the general principle. (See Diagram II.)

DIAGRAM II



The protection consists essentially of the following parts, from the top:

1. A hard flat "*bursting course,*" which retards a howitzer shell sufficiently to cause the fuze to act very quickly and in the case of a gun shell, with a small angle of descent, may deflect it altogether.

2. A "*deflecting course*" which turns the shell that has already penetrated the bursting course into a more horizontal direction.

3. A "*cushion*" in which the shell should explode. It is soft, so that the shock may be disseminated.

4. A *supporting framework* with splinter-proof cover.

In ideal conditions each part should be supported separately with a small air space between, so that the shock on each part is borne separately. Practically, 1, 2, and 3 should be supported separately from 4.

Considering the roof in detail—

(*a*) is a concrete roof about 5 inches thick, reinforced with expanded metal. This is the "bursting course." Immediately under it is a roof (*b*) of match boarding or corrugated iron, which held the concrete in position until it had set. If the concrete roof were made thick, it might inclose the explosion and collapse the whole cover.

(*c*) is a layer of bricks laid on each other so as to form a deflecting course.

(*d*) is the "cushion" in which the shell is to burst, made of sandbags full of gravel or slag.

(*e*) is a supporting roof of girders, iron rails, or baulks kept up by the stanchions (*f*). This must be covered by boarding or corrugated iron to prevent the sandbags escaping.

(*g*) is a small air space which allows a certain amount of sagging of the upper supporting roof before any pressure is borne on the lower supports.

(*h*) is a splinter-proof cushion course laid on the lower supporting roof.

(*k*) is the lower supporting roof, rather stronger than (*c*), as it may have to bear the weight of both roofs. It is supported by stanchions (*l*). It would be improved by a 6-inch layer of concrete immediately above the support, which would distribute a force on any point over the whole lower roof.