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Lieutenant G. E. Benson R.A

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A MACHINE-GUN BATTERY-AND ITS EQUIPMENT.

(Communicated by Lieutenant G. E. BENSON, R.A.)

I.—*Employment of Machine-Guns in a Battery.*

My experience of machine-guns is not very extensive, having been chiefly acquired in the Suakin Expedition of this year; during this time I was attached to the Royal Marine Artillery to assist them in forming a Gardner gun battery drawn by mules on field battery lines, and for the short time I served with this battery ample opportunity was afforded me for thinking over the question of machine-guns and their use, and of watching their effect in the field, with a view to find out the best tactical use that can be made of them in future campaigns; and from what I then saw I feel convinced that a great field is open to them, provided that in future they are equipped in a manner more suited to their powers.

Machine-guns have not hitherto been given the same chance as field-guns; for, when more machine-guns than one have been employed in the field, they have as a rule been separated; so, if one got out of action either from being disabled or jambed, the consequences were serious at that point simply from the fact of its not having the support of other guns. One might as well separate a battery of field-guns by sending each gun to a different place to fire at different objects; for, as I will afterwards point out, machine-gun fire partakes more of the nature of artillery shrapnel fire than of infantry fire.

The formation of the Gardner guns into a regular battery in the Suakin Expedition is no doubt a great step in advance, yet in my opinion it is only *one* step, for the real value of machine-gun fire depends on the rapidity with which they can be moved up and brought to act on any desired point of the field of battle. The only occasion on which the Gardner battery came into action against the enemy when it was not in a defensive position in a zareba, was in the action at Hasheen on March 20th, 1885, on which occasion the guns were run out at the left rear corner of the Guards' square, and opened fire into the scrub at 200 to 300 yards range, whence some of the enemy were annoying us by their fire. After a few rounds the enemy were silenced. Again on the retirement of the force later on in the day the battery was ordered to go outside the square and assist to cover the retirement. This we did by coming into "action rear" on the flank of the square, and firing at the enemy till we were left 30 or 40 yards in rear; then we limbered up, and hurrying along (the men being dismounted we could not go very fast) came into action again on the flank of the square. The enemy at times followed us at a distance of 300 to 400 yards, but did not show themselves much in

the open, except at a much longer range; however we continued our fire as long as we saw them.

Our fire was much hampered by the necessity of limbering up almost immediately after the square passed us; for, as our men were unmounted, we could not retire much faster than the infantry, thus we could never remain long enough in action to make our fire really effective.

If the guns had been drawn by horses, and the gunners mounted on the carriages, we could have taken up each successive position much more rapidly, and it would have been safe to remain longer in action after the square had passed us, thus the whole time of remaining in action would have been increased and the effect of the fire much greater.

At Tamai, the Gardner battery was left with one infantry battalion to defend the zareba, so did not have a chance of coming into action; but as I accompanied the advance on that day, I took note of occasions when the battery might have been employed with advantage.

Several parties of the enemy were firing at us at distances of from 700 to 1,500 yards, and I feel sure that once the range were found (as it speedily would be) a shower of bullets from the machine-gun battery would have silenced those parties that were beyond the limit of infantry aimed fire, much sooner than it could be done by the unaimed infantry fire.

The affair at Hasheen on the 20th is almost the only occasion, I believe, in which machine-guns have been used as a battery acting independently; and this, I take it, is the proper way to employ them. It is all very well to place them to sweep defiles, or at the salients of redoubts when occasion requires; but by confining them to those uses the principal advantage of machine-guns is lost, viz., their mobility. Now, when drawn by mules with the detachments marching alongside, they still cannot move faster than infantry, and (as happened at Hasheen) neither dare they trust themselves far from infantry, nor can they change position with anything like sufficient rapidity to make the most of their fire; for, of course as with artillery, the more time spent in taking up a position, the longer they are out of action and valueless.

The action of machine-guns, as I said before, partakes more of the nature of artillery shrapnel fire than that of infantry fire for the following reasons:—

- 1st. The fire of a battery of machine-guns being aimed by only one picked man per gun is immediately under the control of the Commanding Officer of the battery, who can at will turn his stream of bullets on any spot within 1,700 yards, and form a zone of fire in which no troops could live, just as a battery of artillery sends a smaller number of bullets a greater distance by means of shrapnel shell.
- 2nd. Infantry aimed fire ceases at 900 or 1,000 yards, while machine-gun fire can be aimed and under control up to 1,700 yards at least.

- 3rd. Infantry fire, necessarily from its extended front, cannot be directed on one special object so easily, and in individual firing (from nervousness, bad shooting, &c.) a very large proportion of bullets must go astray; while machine-guns like field-guns have no nerves, and their bullets never fall very far apart.
- 4th. Machine-guns can have the mobility of horse artillery, as before mentioned, if properly equipped.

At Suakin, about the end of March, we had some target practice with the four five-barrelled 450 bore Gardners which we were then using, and the results I think are worth noting here.

The target was a canvas screen 4 feet high and 10 yards long, and we opened fire at what we guessed was 1,050 yards, a range at which infantry fire is no longer aimed. After a few rounds we saw, by the amount of dust knocked up in front of the target, that our range was too short, and increasing the elevation to 1,100 yards fired about eighty rounds per gun. We then limbered up, retired, and came into action at 1,200 yards, when we again fired about eighty rounds per gun. I then rode up to the target, and was surprised to find it literally riddled with bullets. There wasn't a place where a man in any position whatever could have escaped. We afterwards advanced nearer, to about 800 or 900 yards range, and after a few more hundred rounds per gun the target was practically cut to pieces. It was unfortunate that on this occasion we could not try the guns at a longer range than 1,200 yards. The great fire effect at 1,100 and 1,200 yards range is of course due to the combined action of the four guns under one man; and though there were several jams, caused by the extractor pulling the base of the cartridge off, the other guns kept up the fire while a jam was being remedied. It was discovered by the Marine Artillery that the best method of rectifying a jam of this description was by putting a pared bullet in the muzzle of the jammed barrel (just small enough to go down) and pushing it down with the cleaning rod so as to catch the edge of the cartridge case and force it out. But our object in the future is to have a machine-gun which will never jam. It is only with a view of suggesting the manner in which they should be employed when perfected that I write these pages.

II.—*The Equipment of a Battery.*

On the return of the force from Tamai, we took over four of the new two-barrelled 450 bore Gardners sent from Woolwich (sufficient men not being available to man the six provided), but unfortunately during the time I remained with the battery we had no brush with the enemy to test their efficiency in the field, so that my experience of these new guns is small. I hear, however, from an Officer who fired several thousand rounds out of them at Shoeburyness, that they never jam.

The points I noted about their equipment which might be improved on are as follows, viz.:—

The axis of the gun is too high above the ground (about 4 feet); this entails less effective fire at short range, for in sweeping a plain or glacié, the bullets leaving the bore 4 feet above the ground would have a trajectory in a range of 300 yards which would go over the head of a man 200 yards distant. If the axis of the gun were only 3 feet 3 inches from the ground, the highest point of the trajectory would be 9 inches nearer the ground, and the fire would be more effective and sweeping. The great height of the gun causes another important defect, in that it entails the No. 3 of the detachment (who feeds the gun) having to stand on a step to reach the top of the feeder during the time the gun is in action; he thus forms a most conspicuous object for the enemy to fire at. It would be better too, if it could be so arranged, for the feeding number to stand in rear of the axletree instead of in front, and for a folding shield to be fitted on the axletree for his protection. This would reduce his exposure to a minimum. For savage warfare this of course is not so important, as savages are seldom good marksmen.

It struck me, and the same idea was shared by every artillery Officer at Suakin who saw the new guns and their equipment, that the carriages were a great deal too heavy for the guns. The trails and axletrees especially (both E. O. C. and R. C. D.) appeared almost strong enough to withstand the recoil of a 9-pr. gun. Of course, with machine-guns there is no recoil which causes any strain worth mentioning either on the trail or axletree, so all that is required is a trail strong enough to sustain the strain of draught over rough country, and an axletree strong enough to carry the gun and fittings (and men if mounted on axletree seats) under the same conditions.

The traversing and elevating gear appear perfect and are a great improvement on the gear of the five-barrelled guns we used at first.

I will now proceed to give my ideas in detail as to the best method for equipping a battery of machine-guns.

The battery might consist of either four or six guns. The advantages of a four-gun battery are, that it would be handier and would seldom have to be split up on the battle-field. It is also a convenient number to put into a redoubt if used for passive defence. On the other hand the men required to man four guns would barely be sufficient to carry on the ordinary guard and picket duties of a battery. Of the *matériel* let us first consider the gun-carriage and limber. For these I suggest the following figures:—

Axis of gun 3 feet 3 inches to 3 feet 6 inches above the ground.
Wheels 4 feet 8 inches diameter.

Track 5 feet 2 inches (as in present carriage).

The axis of the gun might be lowered by means of crank in the axletree, also by reducing the height of the "crosshead" on which are the elevating and traversing gear. Axletree boxes with guard-irons, &c., for seats to be provided, each box to hold 500 rounds of ammunition in holders. Thus a thousand rounds would be immediately available in case of sudden attack.

The gun, filled axletree boxes and fittings complete, would weigh about $4\frac{1}{2}$ cwt. A folding shield might be added to each axletree box to protect the gunners when in action, this would make the total weight to be supported by the gun axletree about 5 cwt. The feeding should be done from the rear of the axletree; to do this the gun would have to be set a little further back in the carriage at the expense of making the point of the trail a trifle heavier to lift. The arrangement for keeping the barrels cool would be the same as in the present two-barrelled Gardner, as would also the admirable plan by which the feeder is always kept secured to the gun.

The limber might be similar to the present one, except that I would recommend the limber-box to be made longer and narrower, and fitted with guard-irons and hand-straps in order to seat two gunners; the box should hold at least 3,000 rounds in holders, as in the present carriage.

The spare part box should be carried on the wagon to lighten the load for the gun-team to pull as much as possible.

The weight of the limber-box packed, together with intrenching tools, would be about $4\frac{1}{2}$ cwt. The gun-carriage, and limber stripped, should not weigh more than about $11\frac{1}{2}$ cwt. This would make the whole weight of the gun-carriage, and limber packed, about 21 cwt. With four gunners mounted the total weight ought not to exceed $26\frac{1}{2}$ cwt.,—a load which four horses would be able to drag quite as fast as Horse Artillery.

For the carriage of ammunition I think one wagon per gun, fitted up much in the same way as an artillery ammunition wagon, would meet the usual requirements. On the wagon limber would be a box containing 3,000 rounds in holders as in the gun-limber. On the wagon body there might be two boxes, each with 2,000 rounds in holders, while the spare part box might be carried on the footboard. All the ammunition boxes should be fitted with guard-irons and hand-straps for seats. The weight of the ammunition boxes filled on the wagon-limber and body, together with the intrenching tools and spare part box, would come to about 11 cwt. Allowing 12 cwt. for the stripped wagon-limber and body, the weight of the wagon packed would not exceed 23 cwt., which with four gunners mounted would become $28\frac{1}{2}$ cwt. This also could easily be drawn by four horses.

The sergeants and coverers of each gun would be mounted on horseback.

The weights I have allowed for the stripped carriages in the above estimate may seem too low to some people, but it is my opinion that in this age when steel is so extensively used there would not be any difficulty in keeping the weights below those estimated, viz., $11\frac{1}{2}$ cwt. for the stripped gun-carriage and limber, and 12 cwt. for the stripped wagon body and limber.

The following would be the war strength of a battery of machine-guns equipped as above :—

Officers and Men.

	Four-gun battery.	Six-gun battery.
Majors.....	1	1
Captains	1	1
Subalterns	2	3
Sergeant-major	1	1
Quartermaster-sergeant	1	1
Sergeants.....	4	6
Corporals.....	4	6
Bombardiers	4	6
Gunners	28	42
Drivers	34	42
Trumpeters.....	2	2
	<hr/> 82	<hr/> 111
Artificers—		
Farriers	1	1
Shoeing-smiths	2	3
Collar-makers.....	2	2
Wheelers.....	2	2
Armourers for machine-guns..	1	1
	<hr/> 90	<hr/> 120
Total Officers and men ..	90	120

Horses.

	Four-gun battery.	Six-gun battery.
<i>Riding—</i>		
Officers.....	6	7
Staff sergeants	2	2
Other N. C. O.'s.....	8	12
Farriers	1	1
Shoeing-smiths	1	1
Trumpeters.....	2	2
Range-finders.....	2	2
Spare	3	4
	<hr/> 25	<hr/> 31
<i>Draught—</i>		
Guns	16	24
Wagons { Ammunition	16	24
{ Forge	6	6
{ Store	4	4
{ Ammunition and store ..	12	12
Spare	6	8
	<hr/> 85	<hr/> 109
Total horses	85	109

For the sake of comparison I may state that—

	Men.	Horses.
The war strength of a R.H.A. battery is	182	183
The war strength of a 9-pr. or 13-pr. F.B. is	175	132
The war strength of a machine-gun battery of six guns	120	109

The amount of ammunition carried per gun with the battery would be :—

	Rounds per gun.
In the axletree boxes	1,000
In the gun-limber box	3,000
In the wagon-limber and body	7,000
Total	11,000

These numbers are calculated from the amount of room the cartridge-holders for the Gardner gun take up.

The supply of ammunition would be kept up in the field by S.A.A. carts from the ammunition column, each carrying nearly 10,000 rounds in the service S.A.A. boxes.

The empty holders would be refilled from those boxes by the spare gunners while the battery was in action.

The front of this battery in action would be calculated at 15 yards interval between each gun.

If the number of men and horses in the above estimate be thought too extravagant it could be reduced by substituting for the wagons, six two-wheeled carts similar to S.A.A. carts, but fitted to carry 7,000 rounds of ammunition in holders. This arrangement would effect a saving of six drivers and twelve horses, but on the other hand the carts would not possess the mobility of the wagons nor could the spare gunners be mounted on them, and the efficiency of the battery would thereby be impaired to a certain extent.

Lord Charles Beresford has recommended a carriage for machine-guns which will enable the gunners sitting on the trail to keep up a fire in the act of retiring. This I do not think feasible, for these reasons: in the first place it seems to me that the difficulty of feeding the gun when in motion would be insurmountable; and secondly, the motion of the gun going over any but the most level ground would cause the bullets to fly anywhere but in the required direction. If the gun were in danger of being captured while in the act of retiring, it could be better defended by the carbines or revolvers of the detachment than by its own fire, wild and uncertain as it would be under the circumstances. Again, when firing limbered up at the halt the least motion of the horses would throw the trail out, while the time saved by not having to limber up before retiring would be inappreciable. Moreover, by remaining limbered up when in action the limber and horses would be very much exposed and would increase the size of the mark for the enemy's fire to a very great extent.

The only point to be decided on in forming such a battery is the

nature of the machine-gun to use; that question I will not discuss at present beyond saying that if the accounts that have reached me of the performance of the new Maxim gun are correct, there is very little doubt but that this will be the machine-gun of the future. The gun being so light (only 60 lbs.), two of them might be mounted on the same carriage and worked together by the same elevating and traversing arrangement, in fact becoming to all intents and purposes a two-barrelled Maxim gun.

A machine-gun battery, such as I have endeavoured to describe above, could be used in numberless ways in a campaign, and I think it would be especially useful in accompanying cavalry in order to drive away any bodies of infantry before which the cavalry would otherwise have to fall back. When it could get within 1,700 yards of the enemy's artillery it would speedily put a battery out of action before sustaining serious damage itself, while in defending a position against an infantry attack it would be invaluable, combining by its mobility great powers for counter-attack as well as for passive defence.

It is sincerely to be hoped we shall not be behindhand in giving the latest machine-guns a fair trial, equipped in a way suited to their tactical powers, and that it be done in time of peace, so that if war should break out, batteries of machine-guns would be ready for service completely efficient both in their equipment and in the training of the men and horses.

*Mhow, Central India,
June 10th, 1895.*