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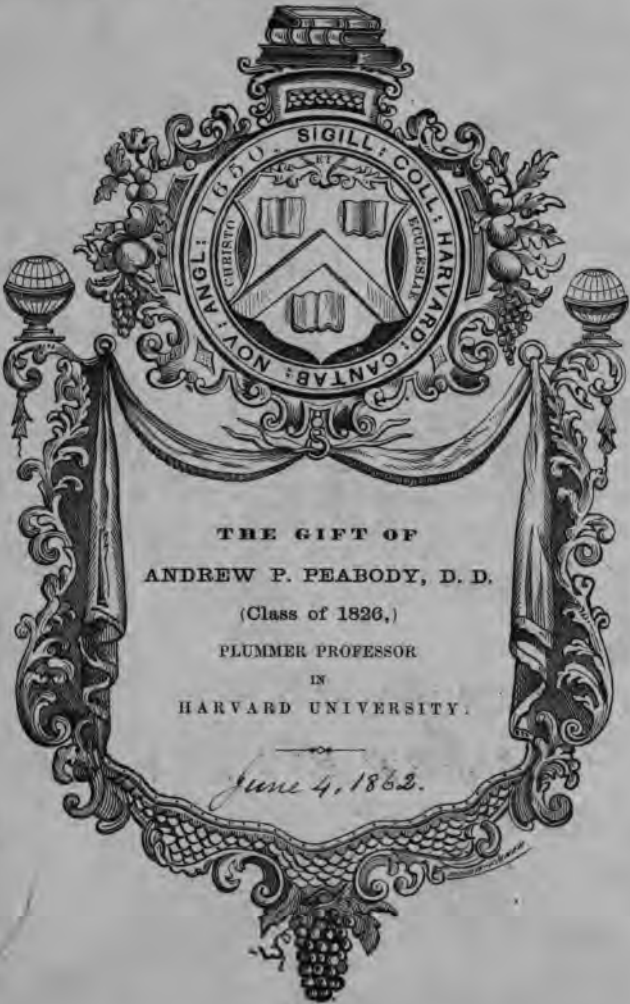
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INSTRUCTION

FOR

NAVAL LIGHT ARTILLERY,

AFLOAT AND ASHORE.

PREPARED AND ARRANGED FOR THE U. S. NAVAL ACADEMY,

BY WILLIAM H. PARKER, LIEUT. U. S. N.

SECOND EDITION, REVISED BY

LIEUT. S. B. LUCE, U. S. N.;

ASST. INSTRUCTOR OF GUNNERY AND TACTICS AT THE UNITED STATES NAVAL ACADEMY.

NEW YORK:
D. VAN NOSTRAND, 192 BROADWAY.

1862.

1862. June 4
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Rev. Andrew P. Peabody
of Cambridge.
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Entered according to Act of Congress, in the year 1862,

BY D. VAN NOSTRAND,

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Southern District of New York.

PREFACE.

THE work on Naval Light Artillery was prepared for the use of the midshipmen at the Naval Academy by Wm. H. Parker, late Lieutenant U. S. Navy, and adopted by order of the Navy Department. It has been used as a text-book for the past year, and found to fulfil every requisite.

The "School of the Battery" is well adapted to the manœuvring of the Howitzers of a squadron, when co-operating in the field.

The "Exercise of the Howitzer Afloat" was prepared and arranged by Captain Dahlgren, and its excellence well proved by the test of actual service.

NAVAL ACADEMY, NEWPORT, R. I.,

March 29th, 1862.

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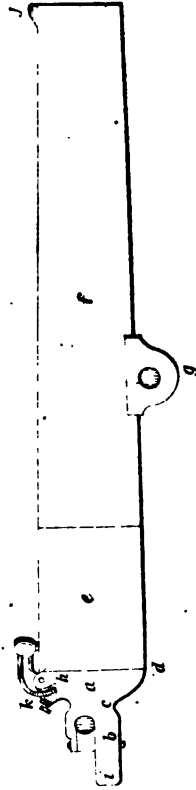
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Boat Howitzer.
U.S. Navy.



THE BOAT HOWITZER

OF THE

UNITED STATES NAVY.

BY COMMANDER J. A. DAHLGREN, ASSIST. INSP. OF ORDNANCE.

NOMENCLATURE.

THE CASCABEL is the part of the gun in the rear of the base ring; it is composed of:

- (a). The breech plate.
- (b). The knob.
- (c). The neck.

- (d). Base ring.
- (e). Cylinder.
- (f). Chase.
- (g). Loop, with hole for bolt.
- (h). Lock lugs.
- (i). Lip for elevator.
- (j). Muzzle-sight.
- (k). Mass for breech-sight.

The BORE includes all the part bored out, viz. :

Cylinder of bore.

Chamber.

These guns should not be rubbed bright, which might render it difficult to point them with a bright sun.

BOAT-CARRIAGE.

(A). Bed.

(B). Slide.

— Compressor plate, } beneath the slide and
 — “ bolts, } not shown on the plate.

(C). “ handles.

(D). Lugs for loop.

FIELD-CARRIAGE.

(A). Axle.

(B). Trail.

(C). Braces.

(D). Lugs for loop.

(E). Trail wheel or runner.

(F). Bolt for do.





(G). Socket for handspike.

(H). Elevator.

(J). Disc of elevator.

(K). Box for elevator.

EXPLANATION OF SIGNS

	<i>Original Position.</i>	<i>Final Position.</i>
<i>Instructor.</i>	○ I	● I
<i>Captain Commanding battery.</i>	◻ C	◻ C
<i>Chief of Section</i>	⊗ X	⊗ X
<i>Quarter Gunner</i>	⊙	⊙
<i>Piece with drag rope Manned</i>		
<i>Piece in Battery</i>		
<i>Platoon of Cannoner</i>	◻ ◻ ◻ ◻ ◻ ◻ ◻ ◻	■ ■ ■ ■ ■ ■ ■ ■
<i>Cannoner at his post</i>	◻	■
<i>Bagler or Trumpeter</i>	○ T	● T
<i>Chief of Piece</i>	◻ Z	◻ Z
<i>Ammunition.</i>	◻ A	◻ A

PART I.

SCHOOL OF THE PIECE.

Remarks.

THE following treatise on the handling of howitzers, has been prepared with a view to its adoption in the naval service, and is intended as an addition to the drill furnished by Commander Dahlgren. In view of the fact that important operations on shore are sometimes undertaken by the navy, it would seem that some knowledge of the manœuvres of a battery of pieces, is absolutely essential to the naval officer. Part III. is devoted to this branch of the subject, though it must be particularly well understood that it is not intended to collect the pieces *en masse whenever a landing is effected*, but only when they are organized as a battery for *special purposes*. This part is founded upon the army "Instruction for Field Artillery," and the *commands* have been retained as nearly as possible.

The howitzers' crews should be well drilled in the method of embarking and disembarking, and in the "School of the Piece." The latter can be learned on

board ship. When occasion presents, the howitzers of the squadron should be landed and drilled in the battery manœuvres. In dividing into sections, of two pieces each, the senior lieutenant, next to the one acting as instructor, would command the first section; the next in rank, the third section; and the next, the second section, in a battery of six pieces. The crews, then, having been previously drilled alike, it is believed that the principal manœuvres of a battery could be learned and performed in the course of a few exercises.

In the exercise on shore twelve men will be attached to the piece (whether the heavy or light 12-pdr.), and the stations will be the same as those prescribed by Commander Dahlgren. The numbering has been changed, and two men have been added to assist the quarter gunner. By this arrangement the odd numbers are stationed on the starboard side of the piece, pull the starboard oars in the boat, and may be selected from the starboard watch.

Each piece will be commanded by a lieutenant when acting singly. When there are several pieces a lieutenant will command a section, which consists of two pieces. The officer in charge of a piece, is called the "chief of the piece," and the one commanding a section the "chief of the section."

In the exercise on board ship the men should be shifted to every station in succession, and well drilled, more particularly the higher numbers, who must be prepared to take the places of wounded men. When drilling on board ship the distance of the ammunition-box in rear of the piece (25 yards, or $3\frac{1}{2}$ drag-ropes), should be measured, in order that the quarter gunner

may be able to judge of the proper distance to carry it. The stations of the crew "in action" should also be carefully attended to.

The crews should be well drilled in the use of the pistol and broadsword.

In short marches, or when exercising on the parade-ground, it is expected that the guns' crews will move their pieces without assistance. The drag-ropes will be fitted with four handles, and two guiding ropes, which will be manned by Nos. 1 and 2 (at the guiding ropes), 5, 6, 7, 8, 9, 10, 11, and 12 in succession. Nos. 3 and 4 follow abreast the muzzle, ready to man the short drag-rope (carried by the quarter gunner and used for holding back), or to assist at the wheels. The quarter gunner follows at the rear of the muzzle.

The length of the drag-rope will be for the heavy 12-pdr. about 20 feet, and for the light about 22 feet. The object in having a longer drag-rope for the light gun is, that the distance from the face of the muzzle to the leaders at the drag-rope may be the same for both guns. With drag-ropes of the above length this distance will be ten yards.

On long marches, or over bad ground, the artillerymen will be assisted by parts of companies. A long drag-rope should be fitted for this purpose, and, unless absolutely necessary, the artillerymen will not man the drag-rope, but will march abreast their stations for action, clear of the other men and of the wheels, and covering Nos. 11 and 12, who keep abreast the leaders at the drag-rope; or they may follow the piece, formed in "line in rear," or may be formed on the right or left of the piece, at the discretion of the commander.

Two boxes of ammunition will be carried on the top of the axle-tree, and each man, with the exception of Nos. 1 and 3, will carry one round in his pouch.

If employed on distant service some arrangement will, of course, be adopted for carrying the extra ammunition. The method of doing this is left to the proper authorities, who will find means to meet the occasion.

It is deemed unnecessary to say any thing in regard to the nomenclature of the piece, fixtures, projectiles, etc., as they are minutely treated of by Commander Dahlgren in his work on "Boat Armament."

When the piece is landed for service, the chief of the piece will see that the captain of the gun has the spare lock, sight-bars, priming-wires, boring bitt, &c., &c., in his havresack, and that No. 2 has a sufficient quantity of primers. No. 4 can carry the spare elevator, and deposit it with the ammunition. As an additional precaution a box of friction primers may be taken.

School of the Piece.

The howitzer, mounted on its field carriage, we will suppose ready for service; rammer and sponge and trail handspike becketed on the right side of the trail; ladle and spare rammer and sponge on the left side. Ammunition-boxes in place, drag-rope coiled up, and in charge of the quarter gunner.

The men will be armed with cutlass and pistol, and all but Nos. 1 and 3, sling a pouch over the left shoulder. No. 1 slings his havresack over the same shoulder, and No. 2 puts on his primer-box, becketts a priming-

Crew at their Stations

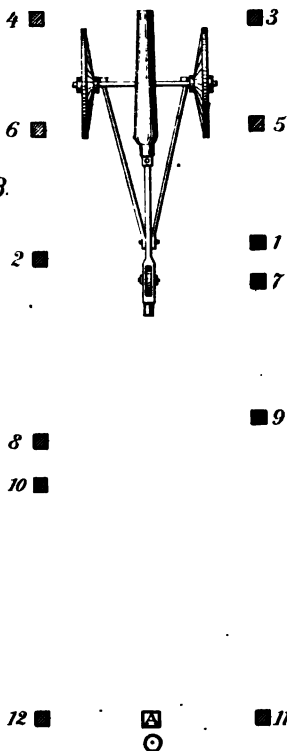


Fig. 3.

Crew at the drag rope.

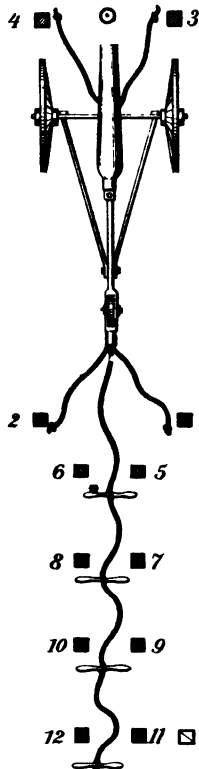


Fig. 1.

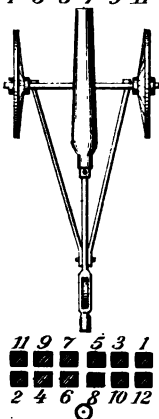
Fig. 2.

Crew to the Rear.

12	10	8	6	4	2
1	3	5	7	9	11

Crew to the Right

12	10	8	6	4	2
1	3	5	7	9	11



12	10	8	6	4	2
1	3	5	7	9	11

Crew to the Left.

Crew to the Front.

11	9	7	5	3	1
2	4	6	8	10	12

wire to his right wrist, and puts a thumbstall on his left thumb.

The men fall in two deep, in close order—No. 1 being on the right of the front rank, and Nos. 3, 5, 7, 9, and 11 standing next in succession, toward the left; No. 2 is on the left of the rear rank, behind No. 11, and Nos. 4, 6, 8, 10, and 12 stand next in succession, toward the right; No. 12 being behind No. 1. The chief of the piece (who is either a Passed Midshipman, Midshipman or petty officer), standing two paces in front of the centre of the crew, calls the roll and reports to the instructor. He then places himself on the right in the front rank. The quarter gunner takes post behind the centre of the crew, one pace distant from it.

Stations of the Crew.

1. **With the piece ready for action.**—(*Pl. 2, fig. 1*). No. 1 is at the rear of the breech, to the right, abreast the trail wheel; No. 2 rear of the breech, to the left, abreast the trail wheel; Nos. 3 and 4 abreast the muzzle; 3 on the right, 4 on the left; No. 5 rear and outside of right wheel; No. 6 rear and outside of left wheel; No. 7 in rear of No. 1; No. 8 five yards in rear of left wheel; No. 9 five yards in rear of right wheel; No. 10 in rear of No. 8; No. 11 abreast the ammunition-box, on the right; No. 12 abreast ammunition-box on the left. The quarter gunner in rear of the ammunition-box, which is twenty-five yards, or $3\frac{1}{2}$ drag-ropes from the piece. All face to the front (which, with the piece ready for action, is in the direction of the muz-

zle), and cover Nos. 3 and 4. The chief of the piece is outside the file, on the left of his piece; but near it and opposite the middle of the trail handspike.

2. **With the howitzer secured ready for a march.** Nos. 1 and 2 at the guiding ropes, Nos. 3 and 4 abreast the muzzle, Nos. 11 and 12 leading. The quarter gunner in rear of the muzzle, and Nos. 5, 6, 7, 8, 9, 10, 11, and 12 at the drag-rope in succession—the chief of the piece at the side of No. 11.

When the piece is drawn by a detachment, detailed for the purpose, the crew march abreast their stations for action, covering on Nos. 11 and 12, who keep abreast the leaders at the drag-rope, and far enough outside to keep Nos. 1 and 2 clear of the wheels. The chief and quarter gunner take post as before.

3. **In front.**—(*Pl. 2, fig. 2.*) The crew, formed in two ranks as before mentioned, take post two yards from the trail, facing the gun, centre opposite to the trail, and are dressed by the chief, who takes post on the right, in the front rank. The quarter gunner takes post in the rear, opposite the centre, one pace distant from it.

4. **In rear.**—(*Pl. 2, fig. 2.*) The crew, formed as above, take post two yards from the muzzle, centre opposite to it, facing the gun, and are dressed by the chief, who takes post on the right, in the front rank. The quarter gunner as before.

5. **On the right or left.**—(*Pl. 2, fig. 2.*) The crew, formed in two ranks as before, are opposite the axle tree, and one yard from it. The chief on the right, and the quarter gunner in the rear.

The instructor, in all cases, takes position at will.

When the howitzer is "secured" or ready for marching the *front* is toward the *trail*. When ready for action or in battery the *front* is toward the muzzle.

Change of Position of the Crew.

6. The crew being in front, to send them to their stations for action, the instructor commands:

1. *Crew to your Stations.*
2. MARCH.

At the first command, the front rank faces to the right, the rear rank to the left; at the second, which is repeated by the chief, the men file to the right and left to their stations, each man halting at his place, and all facing to the front and covering Nos. 3 and 4. The chief and quarter gunner take post as prescribed in No. 1.

7. **From "stations" to front.** The instructor commands:

1. *Crew to the front.*
2. MARCH.

At the first command, the men in front of Nos. 8 and 9 face about; at the second, which is repeated by the chief, the men file off to their posts, Nos. 11 and 12 passing Nos. 9 and 10, who follow them, and who are followed, in succession, by Nos. 7, 5, 3, and 1 in the front rank, and Nos. 8, 6, 4, and 2 in the rear rank. The chief and quarter gunner take post as prescribed in No. 3.

8. **From line in front to line in rear.** The instructor commands:

1. *Crew to the rear.*
2. MARCH.

At the first command, the front rank faces to the right, the rear rank to the left. At the second, which is repeated by the chief, the crew file to their prescribed posts; each rank on its own side of the gun. The chief and quarter gunner take post as prescribed in No. 4.

9. **From line in rear to stations for action.** The instructor commands:

1. *Crew to your Stations.*
2. MARCH.

At the first command the front rank faces to the left, the rear rank to the right; at the second, which is repeated by the chief, the men file off to their stations as before. The chief and quarter gunner take post as prescribed.

10. **From stations to rear.** The instructor commands:

1. *Crew to the rear.*
2. MARCH.

At the first command Nos. 1 and 2 place themselves in front of Nos. 3 and 4; at the second, which is repeated by the chief, the crew file to the rear. The chief and quarter gunner take their prescribed posts.

11. **From rear to front.** The instructor commands:

1. *Crew to the front.*
2. MARCH.

At the first command the front rank faces to the left, the rear rank to the right; at the second, which is repeated by the chief, the crew file to the front, each rank marching on its own side of the gun. The chief and quarter gunner take their prescribed posts.

12. **From front to right (or left.)** The instructor commands:

1. *Crew to the right (or left.)*
2. MARCH.

At the first command the chief faces the men in the desired direction; at the second, which is repeated by him, he marches them to their post as prescribed in No. 5, countermarching when necessary.

From any position to the drag-rope. The instructor commands:

1. *Man the drag-rope.*
2. MARCH.

At the first command the chief faces the men in the direction required; at the second, which is repeated by him, he marches them to their posts as prescribed in Article 2, Nos. 9 and 10, hooking the drag-rope.

Service of the Piece.

13. **Commanding and pointing.** The captain of the piece (No. 1) gives all the executive commands in action. He is answerable that all the numbers perform their duties correctly. He communicates the orders which he receives for the kind of ammunition to be fired; sending to the quarter gunner the length of the fuze when firing shrapnel or shells.

On receiving the command or signal to commence firing, he steps to the left of the breech, and gives the command **LOAD**; and taking hold of the handspike at the end with his right hand, and at the centre with his left, and placing his left knee against the left hand, bending over it, the right knee being slightly bent, he looks over the top of the piece and gives the direction. He then steps to the breech to give the elevation, which

he does by taking hold of the elevator, drawing back his right foot, and bending over his left knee. When the piece is loaded and pointed he gives the command, **READY**, and stepping clear of the wheel, to that side where he can best observe the effects of his shot, gives the command, **FIRE**. At the command **READY**, No. 9 unships the handspike. No. 7, standing on the right quarter of the breech clear of the wheel, handles the lock-string and fires the gun at the command, **FIRE**. No. 2 stands outside of the left wheel, and Nos. 3 and 4 fall back on Nos. 5 and 6. The chief stands on that side where he can best observe the effects of the firing. As soon as the piece has been fired, No. 9 ships the trail handspike, and No. 1 causes the piece to be run up to its former position if necessary. When the commands are all given by the instructor, as in loading by detail for the instruction of recruits, No. 1 performs the same duties, but without repeating the commands.

14. **Sponging and loading.** At the command, **SPONGE**, No. 3 steps to the muzzle, enters the sponge, and pushing it firmly to the bottom, turns it round and withdraws it. No. 2 serves the vent, and holds his hand in such a manner as to allow No. 1 to sight over his thumb. The quarter gunner adjusts a fuze, and hands it to No. 12 to pass. At the command, **LOAD**, the charge is passed from No. 12 to No. 10, and along the left of the piece to No. 4, who enters it. No. 3 rams home to the mark. No. 2 puts in a primer as soon as the rammer is withdrawn. He will not find it necessary to use the priming wire, unless the vent should be foul.

15. **Serving ammunition.** No. 8 receives instructions from the chief of the piece, or from No. 1, as to the

length of the fuze, &c., which he communicates to No. 10, who receives the charge from No. 12, or the quarter gunner. Nos. 11 and 12 assist at the ammunition box, and are careful not to raise the lid unnecessarily.

16. The howitzer being secured for the march, to commence the service of the piece, the instructor commands: *To your stations*; at which No. 1 puts in the proper sight-bar, uncoils the lock-string, and hands from his havresack to No. 2, a priming-wire and thumbstall. No. 3 takes the rammer and sponge and keeps it in his hands until the firing is discontinued. No. 4 places the ladle and spare rammer and sponge in his rear. No. 7 ships the trail handspike and unbolts the trail wheel. Nos. 9 and 10 unhook the drag-rope and deposit it with the ammunition-box. Nos. 11 and 12, with the quarter gunner, unsling the ammunition-box and carry it twenty-five yards to the rear. The crew then take their prescribed stations for action. The instructor then commands, *Commence Firing*, upon which No. 1 gives the commands, SPONGE, LOAD, POINT, READY, FIRE; SPONGE, LOAD, &c. At the command, *Cease Firing*, the crew resume their stations. If the piece is loaded at the time the order to cease firing is given, it will be discharged, unless orders to the contrary are given; and in no case will a piece be dismounted, or secured for the march, without discharging it, or drawing the charge.

17. In drilling the men at loading and firing, it is not deemed necessary to adopt the army system of drilling by *motions*. The gun is sponged as if it were a great gun, and No. 3 should be selected from one of the spongers of those guns. The piece, generally, is served as ordered in the Ordnance Instructions, page 95, ap-

pendix. When the instructor gives the commands in detail, they are five in number, viz.: *sponge, load, point, ready, fire*. When the captain of the gun is simply exercising the crew in their duties, he uses the same commands, but in action, he commands: **LOAD, READY, FIRE; LOAD, &c.** As soon as the piece is fired, No. 1 commences pointing it, without regard to the loading. No. 2, in serving the vent, keeps his right hand at his side, and places the left thumb on the vent, with the fingers of that hand extended on the left side of the gun, and underneath it.

18. After the exercise, to prepare for the march, the instructor commands: *Secure the howitzer*: No. 1 puts the sight-bar, priming-wire, &c., in his havresack, and coils the lock-string. No. 3 becketts the rammer and sponge, and trail handspike on the right side of the trail. No. 7 assists him. Nos. 4 and 6 becket the ladle and spare rammer, and sponge on the left side of the trail. No. 7 bolts the trail wheel. Nos. 9 and 10 hook the drag-rope. Nos. 11 and 12, and the quarter gunner, sling the ammunition box. The crew then go to their stations as prescribed in No. 2; manning the drag-rope unless otherwise ordered.

19. **Changing stations.** In order to instruct the men in all the duties at the piece, the instructor causes them to change stations by commanding: *Change stations, MARCH*. At the command *change stations*, the men on the right of the piece face about, those that have equipments take them off and lay them at their feet. At the command **MARCH**, each man takes the place and equipments of the one on his front. The men on the right again face to the front.

Service and Exercise with Reduced Crews.

20. Disabled men will be replaced by the higher numbers, commencing with No. 12; except that No. 1 will always be replaced by No. 2 if possible. Nos. 11 and 12 should be particularly well drilled in all the duties at the piece, and may be picked men.

Coming into Action.

21. **To the front.** The instructor commands:

In battery—ACTION FRONT.

Nos. 1 and 2 raise the trail and carry it round to their right, Nos. 5 and 7 turn the right wheel to the front, and Nos 6 and 8 the left wheel to the rear. All then take post as in No. 16. The implements and ammunition being changed to their proper places, as there prescribed.

22. **To the right (or left.)** The instructor commands:

ACTION RIGHT (OR LEFT.)

The piece is placed in the required direction by Nos. 1, 2, 5, 6, 7 and 8, and all take their stations as before.

23. **To the rear.** The instructor commands:

Fire to the rear—IN BATTERY.

The crew go at once to their prescribed stations.

Moving the Piece by Hand.

24. **To the front.** The instructor commands:

1. *By hand to the front.*
2. MARCH.

At the first command, Nos. 1 and 2 seize the trail handspike, and Nos. 5, 7 and 9 the spokes of the right wheel; Nos. 6, 8 and 10 the spokes of the left wheel. Nos. 3 and 4 prepare to carry the rammer and sponge and ladle, and Nos. 11 and 12, with the quarter gunner, the ammunition-box. At the second command, the piece is moved forward.

25. **To the rear.** The instructor commands:

1. *By hand to the rear.*
2. **MARCH.**

At the first command, Nos. 1 and 2 facing to the rear, seize the trail handspike. The other numbers as before. At the second command, the piece is moved to the rear.

In moving the piece by hand, all halt and resume their stations at the command, **HALT.**

Should the piece be loaded, at the command, *By hand to the rear (or front)*—**MARCH**, No. 2 puts in the priming wire. At the command, **HALT**, he takes it out again, and No. 3 rams home. The piece may be sponged and loaded by Nos. 2, 3 and 4, while in motion.

26. **To support in retreat.** On descending ground the command, *Nos. 3 and 4*—(or *Nos. 3, 4, 5 and 6, &c.*)—**SUPPORT IN RETREAT**, is sometimes given. The members designated hold back on the short drag-rope, which is hooked by the quarter gunner. To cease supporting, the instructor commands: **STATIONS**, when all resume their stations as before.

Exercise of Several pieces.

<i>Crew in line.</i>	<i>Marching by the Right Flank.</i>	<i>Marching in Column Right in front.</i>

Exercise of several Pieces,

27. (*Pl. 3.*) For the exercise of several pieces the crews are drawn up by their chiefs, who call the roll, report to the chief of section, and take post on the right in the front rank. In addition to the instructor, there is an officer (a lieutenant) assigned to every two crews, who takes post two paces in front of the centre of his command. The instructor then wheels his command into column or faces it to a flank; to the right if he is to approach the battery on the left, and to the left if he is to approach it on the right. When in column the chief of the piece is two paces in front of the centre of his crew; when faced to a flank he is by the side of the leading front-rank man. In both cases, the officers commanding sections are two paces from the directing flank, and opposite the centre of their command. The crews are then marched to the battery, and when near it, the instructor commands: *Crews opposite your pieces.* Each crew is halted by the chief of piece when opposite its piece. They are wheeled into line, or faced to the front by the instructor, and then ordered and marched to their stations by the commands and means laid down in No. 1.

The men are exercised in their duties in the manner already described. The officers carefully superintend them, and see that they perform their duties correctly.

To leave the battery, the crews are ordered to the rear, wheeled into column or faced to a flank, closed to proper distances, and marched from the battery in the manner just described for marching to it.

Changing Wheels.

28. To change the right wheel, the instructor commands :

1. *Prepare to change the right wheel.*
2. CHANGE THE WHEEL.

At the first command, No. 7 places the trail handspike under the axle-tree, and close to the shoulder. No. 9 mans the forward end of it. No. 5 takes out the lynchpin and takes off the washer. Nos. 11 and 12 bring up the spare wheel. At the second command, the carriage is raised, No. 5 shifts the wheel; Nos. 11 and 12 carry the old wheel to the rear.

To change the left wheel, No. 10 mans the forward end of the handspike, and No. 8 the after end. No. 6 shifts the wheel. Nos. 11 and 12 bring up the new, and take away the old wheel, as before.

The piece may be sponged and loaded by Nos. 2, 3 and 4, during the operation.

When a wheel has been disabled and cannot be replaced by another, the axle-tree may be supported by a spar, with one end resting on the ground, and the other lashed to the carriage.

When a wheel has been so disabled that it cannot turn, a shoe of wood may be made and placed under it. The end in front is given the proper form, and the wheel is locked.

Dismounting Pieces.

29. To dismount the piece and carriage, the instructor commands :

1. *Prepare to dismount the piece and carriage.*
2. **DISMOUNT.**

At the first command, the implements are placed outside the wheels; Nos. 1 and 2 remove the elevating screw and tend at breech; Nos. 3 and 4 tend at muzzle; Nos. 5 and 6 tend at wheels; No. 7 goes to the assistance of Nos. 1 and 2; No. 8 draws the loop-bolt, and assists Nos. 1 and 2. Nos. 9, 10, 11 and 12 prepare to raise the trail. At the second command, Nos. 3 and 4 bear down on the muzzle, the trail is raised, the bolt drawn, and Nos. 1, 2, 7 and 8, raise the breech. The carriage is run back, Nos. 9 and 11 raise the right axle, Nos. 10 and 12 the left axle, and the wheels are removed by Nos. 5 and 6. The gun is placed on the ground, vent upward. If the piece is heavy, a strap may be passed round the cascable, and the trail hand-spike thrust through it, to assist in dismounting it.

If the piece is under fire which cannot be returned, the men lie flat on the ground after dismounting it; observing to keep on their proper side of the gun, and outside of the wheels and implements.

Mounting Pieces.

30. To mount the carriage and piece, the instructor commands:

1. *Prepare to mount the carriage and piece.*
2. **MOUNT.**

At the first command, the piece is raised upright by Nos. 1, 2, 3, 4, 7 and 8, and steadied in that position.

Nos. 9, 10, 11 and 12 prepare to raise the carriage, and Nos. 5 and 6 the wheels. At the second command, the carriage is mounted and run up to receive the piece. Nos. 1 and 2 replace the screw, No. 8 puts in the loop-bolt; the implements are restored to their proper places, and the crew resume their stations for exercise.

Carrying Pieces.

31. The piece being mounted, and the road not sufficiently wide to admit the passage of the carriage, the instructor commands:

1. *Prepare to carry the piece.*
2. CARRY PIECE.

At the first command, No. 1 removes the screw. A spar—a boat's mast for example—is laid along on top of the piece, and the piece lashed to it by Nos. 2, 3, 4, 7 and 8. Straps may be fitted for this purpose. Nos. 3, 4 and 7 man the forward end; 1, 2 and 8 the after end. No. 8 first drawing the loop-bolt. Nos. 9, 10, 11 and 12 prepare to raise the carriage, and Nos. 5 and 6 stand ready to take off the wheels. At the second command, Nos. 1, 2, 3, 4, 7 and 8 raise the spar to their shoulders. The wheels are taken off and the carriage laid upon the ground to allow the men at the after end of the spar to step over it. At the command MARCH, repeated by the chief, the men with the piece move forward, and are followed by Nos. 5 and 9 with the right wheel; Nos. 6 and 10 with the left, and Nos. 11 and 12 with the carriage.

The ammunition and implements must be carried by supernumeraries.

If the piece is to be carried any distance, Nos. 1, 2, 3, 4, 7 and 8 must be assisted by supernumeraries, or frequently relieved.

Six men can carry the light howitzer with ease, and the heavy howitzer can be carried by them a short distance, to cross a stream over a narrow bridge, or a marsh over a pathway of planks, for example.

The crew can return for the ammunition and implements if no supernumeraries are at hand; for in this case it is to be supposed that there is no enemy present to oppose the passage of the piece.

The instructor will frequently exercise the crew in carrying the piece and carriage, on board ship, as nothing tends more to facility of handling it, both on shore and in the boat, than a knowledge of its weight.

To mount the piece, the instructor commands:

1. HALT.
2. *Prepare to mount the carriage and piece.*
3. MOUNT.

At the second command, the carriage is laid upon the ground and the men with the piece step back, carefully, over it, so as to bring the piece over the axle-tree. Nos. 9, 10, 11 and 12 then prepare to raise the carriage, and Nos. 5 and 6 to put on the wheels.

At the third command the piece is mounted as prescribed in No. 30.

Righting Carriages that have been Overturned.

32. When a carriage has been overturned, it is better, if time permit, to disengage the piece, right the car-

riage, and then mount the piece again in the manner already described. Light carriages may be mounted by hand without trouble, and heavy ones may be righted by means of parbuckles.

Shelter against Cavalry.

33. Should the howitzer be charged by cavalry, the crew will retreat to the nearest square of infantry; always observing to carry with them the ammunition and implements. If there is a probability of the horsemen attempting to carry off the piece, it would be well to take off a wheel, and carry it into the square, or the piece might be dismounted.

When there is no square to retreat to, shelter may be obtained in woods, if near at hand; if both the above means fail, the men must throw themselves under the piece, and make the best defence possible with their pistols and cutlasses.

The captain of the gun should always carry in his havresack steel spikes, for spiking the gun if required so to do.

Manual of the Sword and Pistol.

The crew being drawn up in two ranks as "in line in front," the instructor commands: *to the rear open order*—MARCH; when the ranks will be opened as with infantry.

To show the mechanism, the execution of each command is divided into *motions*, with *pauses* between

them. The last word of a command should be followed by the prompt execution of the first motion, and the words TWO, THREE, &c., by that of the other motions. When the words of execution are to be so given, the instructor intimates that the manual is to be *by detail*: this rule is general.

After the different motions are perfectly understood, they are executed without stopping at each one; care being taken that none of them are slighted, and that the manual does not derange the position of the body.

The men will be exercised for a portion of the time in the facings and marchings, with their cutlasses sheathed.

The instructor points out and names the different parts of the sword—HILT: *gripe, guard, sword-knot or becket*; BLADE: *back, edge, point*; SCABBARD: *bands or rings*. He then commands:

1. *Draw*—SWORDS.

At the command *draw*, turn the head slightly to the left without deranging the position of the body; bring the hilt to the front; run the right wrist through the becket, seize the gripe, draw the blade 6 inches out of the scabbard, pressing the scabbard against the thigh with the left hand; and turn the head to the front.

At the command SWORDS, draw the sword quickly, raising the arm to its full extent, and throwing forward the point; make a slight pause, carry the blade to the right shoulder, edge to the front; the wrist resting against the hip; the little finger on the outside of the gripe.

Present—SWORDS.

At the command SWORDS, carry the sword to the

front, the arm half extended, the thumb opposite to and six inches from the neck; the blade perpendicular, the edge to the left; the thumb extended on the side of the gripe; the little finger by the side of the others.

Carry—SWORDS.

At the command SWORDS, carry the back of the blade against the hollow of the shoulder; the wrist resting against the hip, the little finger on the outside of the gripe.

Inspection of—SWORDS.

At the command SWORDS, take the position of *present*—SWORDS.

TWO.—Turn the wrist inward; show the other side of the blade; and turn the wrist back.

THREE.—Carry the sword to the shoulder.

On parade, the last motion is not executed until the inspector has passed the next man.

NOTE.—This method of inspecting the cutlasses of the boarders, might well be adopted by officers at quarters.

Return—SWORDS.

At the command *return*, bring the sword to a *present*.

At the command SWORDS, carry the wrist opposite to and six inches from the left shoulder; lower the blade, and pass it across and along the left arm, the point to the rear; turn the head slightly to the left, fixing the eyes on the opening of the scabbard; return the blade; free the wrist from the becket; turn the head to the front, and drop the right hand by the side.

If the instructor wishes to rest the men, the sword being drawn, he commands:

Parade—REST.

At the command **REST**, carry the right foot six inches to the rear, the left knee slightly bent, the body upright on the right leg; the back of the sword resting in the hollow of the right arm; the hands being crossed in front, the left hand over the right.

At the command **ATTENTION**, resume the proper position with sword drawn. When the sword is not drawn, the position is the same as with the sword drawn, except that the arms are folded over the chest.

After the manual of the sword has been taught, the men will be exercised in the facings and marchings with the sword drawn.

Manual of the Pistol.

The manual of the pistol consists simply in the loadings and firings.—It is perhaps the most dangerous weapon which can be placed in the hands of a sailor, and great care must be taken to prevent accidents.—Two things must be particularly insisted upon; first, that the muzzle be kept pointed upward, or directly to the front while loading; secondly, that if carried at the side, in the right hand, the muzzle must be kept downward, with the fingers *off the trigger*. To load the old-fashioned Navy pistol, command:

Handle—**PISTOL**.

The pistol is drawn from its sheath and carried in the right hand, with the muzzle downward; the arm extended in the position of *carry*.

Load in ten times—**LOAD**.

At the command **LOAD**, make a half face to the right,

and carry the pistol in the left hand, left fore-arm about horizontal, and muzzle to the front.

PRIME.

The pistol is half-cocked and the cap put on.

CAST ABOUT.

The pistol is carried up in front of the body, barrel to the front; and held in the left hand, at a convenient height.

Handle—CARTRIDGE.

Tear—CARTRIDGE.

Charge—CARTRIDGE.

Draw—RAMMER.

Ram—CARTRIDGE.

Return—RAMMER.

Carry—PISTOL.

These commands are executed as in the manual of the musket, except that at the command *Carry PISTOL*, the pistol will be carried in the right hand, by the right side, arm extended, and fingers outside the guard.

If the instructor wishes to exercise the crew in the firings, he commands :

READY.

At which the pistol will be held in the left hand, muzzle upward, and cocked with the right thumb; making at the same time a full face to the left.

AIM.

At which the pistol will be held at nearly the full extent of the right arm, fore-finger on the trigger, and left arm by the side.

FIRE.

At which it will be discharged.

The instructor will then command: *Carry PISTOL*,

LOAD, or *Return PISTOL*, as desired. In executing which the crew face to the front, or as required. In loading a revolver, it should be held in the left hand, first capped, and then loaded; the muzzle either to the front or upward, as convenient.

The commands are simply: **PRIME, LOAD.**

Before loading, close the rear rank; and with undrilled crews it would be well to do so in one rank.

In firing at a target let each man step out singly, cock his pistol, fire, and retire; the others carrying their pistols as before directed.

PART II.

DISEMBARKATION AND EMBARKATION.

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DISEMBARKATION AND EMBARKATION.

Fixtures in Boats for Boat Guns.

Two eye-bolts on each bow, to receive the hooks of the skid; two cross-pieces, of yellow pine, to bear the carriage, so as to carry the muzzle of the howitzer just above and clear of the gunwale and stem.

One piece of yellow pine scantling, placed lengthwise and amidship, mortised into the rear cross-piece, to sustain the carriage in sweeping.

Movable Pieces.

Six pivot-plates and bolts—one at the stem, one at the stern, one at each bow, and one on each quarter; two light wooden tracks to lay along the thwarts for the wheels of field carriage and the slide of boat carriage; one midship wheel track for the trail of field carriage; two stout skids, each fitted at one end with two hooks, and connected at the shore end by an iron brace.

The chocks with rollers at the stem and stern-posts of launches, are arranged to be removed when the gun is to be used.

Implements for shifting the Howitzer from boat to field carriage.

One muzzle block.

One selvagee strap.

One shifting spar.

One short iron or wooden bolt, which will enter the breeching hole, to keep the piece on the right slue.

Implements, complete, for serving and working the Howitzer.

Breeching for boat gun (if deemed necessary.)

Lock with lock-string.

Elevating screw.

Sight.

Priming-wire.

Boring-bit.

Vent-cloth.

Sponge and rammer. Do. spare.

Spring spike.

Rat-tail file.

Haversack, with strap, for captain of howitzer, to contain a supply of primers, spare fuzes, spare lock, vent-bit, vent-cloth, and implements for spiking; leather ammunition pouches for each of the men of the field gun, except Nos. 1 and 2, to be supplied by the quarter gunner, with one round of ammunition each, a set of common fuzes, and two primers, when the order to land is given.

Drag-rope, fitted with hooks and handles.

Trail handspike.

A rope, or chain, to lock the wheels in descending slopes.

Ammunition.

A chest containing shrapnel.

“ “ shell.

“ “ canister.

These chests are of two sizes; the single, holding nine, and double, eighteen rounds.

A key is becketed to each box for unscrewing the lid.

Cutting tool for *opening* the Bormann fuze.

FOR SMALL-ARMS.

Cartridge boxes and belts, furnished with cartridges and percussion caps, screw-driver, cone-key, and wiper.

An empty powder tank for magazine, to contain filled cartridge boxes and spare cartridges.

Small-Arms.

Breech-loading guns, in loops or brackets under the gunwale of the boat, protected by a water-proof canvas covering, running round the rising of the boat.

Rifles.

Revolvers.

Swords.

Boat arm-chest.

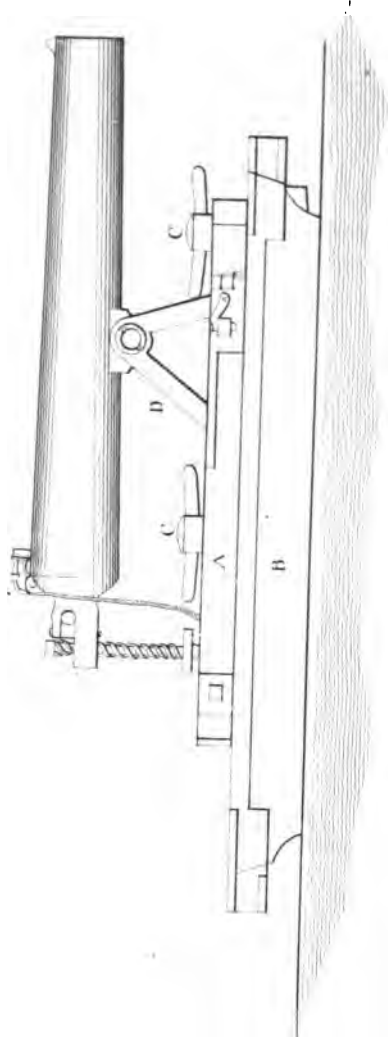
A good tarpaulin to cover ammunition, &c.

Exercise of Howitzer Afloat.

Plate 4.

The Ordnance Manual contains a table of articles required for boat service; as well as a "form of exercise" by Commander Dahlgren. The latter explains fully the handling of the gun in the boat; landing it, and embarking. The arrangements for so doing may well be called *complete*, and no departure from the rules laid down is contemplated. The numbering having, however, been changed, for the reasons previously assigned, it is necessary to point out the duties of each; as well as the position of each number in the boat, and at the gun. These stations will be as follows:

BOAT.		HOWITZER.
<i>Stations.</i>		<i>Duty.</i>
Quarter gunner.....	Stern Sheets,	Ammunition.
Coxswain.....	Helm,	Signals, and assists with ammunition.
Qr. Master.....	Stern Sheets,	Superintends the firing.
Chief of Piece.....	Bow,	
	<i>Port.</i>	
	<i>Starboard.</i>	
No. 1.....	Bow oar,	Captain of howitzer, points, &c.
" 2, Bow oar.....		2d Captain tends vent, primes, &c.
" 3.....	2d oar,	Sponger.
" 4, 2d oar.....		Loader.
" 5.....	3d oar,	Forward compressor.
" 6, 3d oar.....		After do.
" 7.....	4th oar,	Tends train-rope.
" 8, 4th oar.....		
" 9.....	5th oar,	
" 10, 5th oar.....		
" 11.....	6th oar,	
" 12, 6th oar.....		
" 13.....	7th oar,	
" 14, 7th oar.....		
" 15.....	8th oar,	
" 16, 8th oar.....		
" 17.....	9th oar,	
" 18, 9th oar.....		
" 19.....	Stroke oar,	Run field carriage forw'd when land'g.
" 20, Stroke oar.....		do.



As the bow oars cannot well be pulled when the howitzer is mounted forward, Nos. 1 and 2 do not ordinarily assist at the oars; but will stand at the breech of the gun, and will see that every thing is ready for firing; or landing, as the case may be.

When a howitzer-boat is sent on distant service, the gun should be placed at the bottom of the boat. Nos. 1 and 2 will then pull the bow oars. In such a case the field carriage may be taken to pieces and stowed as most convenient. All that would be necessary for this purpose would be to take the wheels off.

In order that the boat may be quickly ready at the call "All boats arm and equip," the officer commanding should assign particular duties to each man. All small articles belonging to the gun should be collected in the "spare article box;" and those belonging to the boat, in a box, to be denominated the "boat box." [For list of articles, see Ordnance Manual, pages 99, 100, &c.]

The following is given as an assignment of duties to a crew of a howitzer-boat, crew consisting of twenty men, coxswain, quarter gunner and quarter master—twenty-three in all. It is merely given as a "form," and will be modified to suit circumstances.

At the call to "Arm and Equip."

- Nos. 1, 2, and 8: Go in the boat, drop her to the gangway, place traverses, pivot-plates, &c., and make all preparations for receiving the gun.
- No. 3: Provides rammers and sponges, pivot-plates, bolts, shifting spar, ladle, trail, handspike and selvagee strap.

- Nos. 4 and 10: Box of spare articles for the howitzer; pass in traverses, skids, &c.
- Nos. 5 and 6: Howitzer, rifle and pistol ammunition.
- No. 7: Pouches and haversack.
- No. 9: 12 cutlasses and belts, 12 pistols and 2 hatchets.
- No. 11: 5 rifles, with belts and bayonets; bag to stow them in.
- No. 12: 5 rifles, with belts and bayonets; tarpaulin cover for ammunition.
- No. 13: Bbl. of pork, cheese.
- No. 14: Kegs of water.
- No. 15: Bread (in water-proof bag).
- No. 16: Galley, fuel, sand.
- No. 17: Vessels for cooking.
- Nos. 18, 19, and 20: Assist the coxswain in passing into the boat the spars, sails, awning, oars, boat-hooks, rudder, tiller, moorings, kedge, sheet lead, stern fasts, spun-yarn, junk, fishing lines, lamp-wick, caulking iron, mallet, copper boat-rivets, needles and twine, muffling for oars, axe, hammer, saw, chisel, grapnels (hand), iron tacks, flint and steel, nails, tinder-box, lead line, lantern, candles, old canvas, gimlets, tourniquet, &c., &c., as required by the Ordnance Manual.

The coxswain will take the whiskey under his immediate charge.

If the *tracks* are not laid, or the pivot-plates bolted, each man, after stowing away the articles he has provided, will assist in preparing the boat to receive the gun.

The quarter gunner will look after, and see in the boat, the spare lock, screw, sights, spring spikes, fuzes, primers, caps, spur tubes, rat-tail file, priming-wires, boring-bit, drag-rope, wrench, tank (spare powder), &c., &c.

Most of the articles provided by the coxswain and his assistants, are kept in the "boat box."

Those provided by the quarter gunner must be kept in the "spare article box," if possible.

The quarter master provides a pistol and cutlass for himself and the quarter gunner; ensign, signals, answering pendant, compass, spy-glass, &c., keeping whatever he can always in the "boat box." Upon getting into the boat, he will assist the quarter gunner in stowing away and distributing the ammunition.

Each man must carry his pea-jacket, knife, spoon, tin pot and pan.

The chief of the piece will go into the boat and superintend the fitting out; after the gun is mounted, he will cause the captain to put on the lock and tangent sight-bar, and assure himself that every thing about the gun is in working order. He will have the provisions, ammunition, &c., stowed in the best possible manner. The field carriage will be placed aft; and the masts and bowsprit slung over the side under the oars, unless wanted to step.

The gun's crew will put on their cutlasses and pistols, and the numbers from 13 to 20 (inclusive) will put on

their belts and bayonets, and place their rifles conveniently. The two spare rifles are for the use of the quartermaster and coxswain.

The crews of the howitzer boats should always be armed with the rifle or musket possessing the greatest range, particularly those in boats carrying the 24-pdr. howitzer, which is never landed. The reason for this is apparent.

The officer commanding the boat should remain in the gangway, and superintend the hoisting out of the howitzer, the passing of provisions, &c., and will not leave the ship until he is *sure* that the boat is fitted out in the proper manner.

Having shoved off from the ship, to commence the exercise, the instructor commands:

MAN THE HOWITZER.

Nos. 1, 2, 3, 4, 5, 6 and 7 trail oars.

No. 1 goes to the rear of the breech, uncoils lock-string, &c.

No. 2 goes to the left side of breech, to be ready to serve the vent.

No. 3 to starboard side of muzzle, to sponge.

No. 4 " port " " " " load.

No. 5 on starboard side, at forward compressor.

No. 6 on port " " after "

No. 7 tends train-rope.

[The men are equipped for the service of the piece as before directed, in the "School of the Piece."]

The gun must be run in if not loaded.

1. SPONGE.

No. 2 closes the vent.

No. 3 sponges.

The quarter gunner prepares the shell or shrapnel.

2. LOAD.

Quarter gunner passes charge forward.

No. 3 rams home after No. 4 has entered the charge.

No. 2 serves vent.

3. POINT.

Nos. 5 and 6 ease the compressors.

The gun is run out, and the compressors tightened.

The chief of the piece adjusts the sight-bar.

The captain points; No. 7 tending the train-rope, and No. 2 the elevator.

4. READY—FIRE.

If the boat have motion, or is under way, a discretionary execution of this order is necessarily implied.

The assumed elevation having been given by the elevator, a slight motion of the helm is made to sweep the piece laterally, so as to cross the object.

The captain of the gun closely watches this movement, with his eye down on the sights, and, holding the lock lanyard firmly, draws as soon as the sights coincide with the object.

Immediately after firing, he coils up the lanyard, and pulls from the vent any pieces of the quill that may remain, also enters the bit to clear it entirely through.

The charge may refuse fire; if this arises from not properly drawing the lock, it will be evident at sight, as the wafer of the primer will not flash, in which case No. 2 will throw back the lock.

If the primer explodes without acting on the charge, care must be taken not to approach the piece too soon, as it may only hang fire, and the recoil will injure any one in the way of it. After a seasonable pause, the

captain of the howitzer will remove the residue of the primer, pass the bit down the vent, and reinsert another primer. *

Pivoting the Howitzer.

The instructor commands :

PIVOT ON THE STARBOARD (OR PORT) BOW.

No. 7, with the assistance of the others, trains the rear end of the slide into the bow pivot which is *not* to be used, and bolts it in. No. 3 draws the stem pivot, and with assistance, draws round the forward end of the slide into the pivot to be used, and drops in the bolt. No. 7 withdraws the bolt from the rear end of the slide. [Ordnance Manual, page 91, *Appendix*.]

Transporting the Howitzer.

See Ordnance Manual, page 91, *Appendix*.

By placing the *skids* amidships, at a distance apart nearly equal to the breadth of the boat slide, *grooves up*, the gun can be slid aft with great ease. The gun's crew are sufficient for this purpose, and the rest of the crew can render most assistance by *remaining quiet*. When the gun is near the after thwart, lift the field carriage over it, turn the trail over forward, and run it in the bows. The thwarts will support the wheels while moving it.

* Dahlgren's Manual of Boat-Howitzer.

Disembarkation of the Howitzer.**1. PREPARE TO LAND.**

The quarter gunner fills the pouches, &c.; as in Ordnance Manual.

Each man, except Nos. 1 and 3, slings a pouch over the left shoulder. [This keeps the pouch clear of the cutlass.]

TRAIL BOW AND STROKE OARS.

Nos. 1 and 2, adjust the bed of the boat carriage, place the muzzle-block, &c.

2. TRAIL.

Nos. 3 and 4, over the bows to adjust the skids, which are launched by Nos. 5 and 6. Nos. 1 and 2 take out the screw, and attend at breech (and muzzle if required).

Nos. 7, 9, 10 and 12 (assisted by Nos. 11 and 14 if necessary), man the shifting spar.

No. 8 draws the loop-bolt. The stroke oarsmen and quarter gunner run the carriage forward.

3. SHIFT THE HOWITZER.

Nos. 1 and 2 clear the screw. Nos. 5 and 6 back the bed on the slide. No. 8 puts in loop-bolt. Nos. 1 and 2 replace the screw. Nos. 9 and 10 hook the drag-rope. Quarter gunner ships trail handspike, if not previously shipped.

4. LAND.

Nos. 5, 6, 7 and 8, as also 3 and 4, divide to the skids; otherwise as in Ordnance Manual. As soon as the howitzer is landed, the quarter gunner, with Nos. 11 and 12, gets the ammunition ashore.

The gun is then brought into action, as prescribed in the "School of the Piece;" or secured for the march.

All manœuvres ashore being executed as prescribed in the "School of the Piece."

Embarkation of the Howitzer.

As in Ordnance Manual, except that Nos. 3, 4, 5, 6, 7 and 8, divide at the wheels; the quarter gunner and stroke oarsmen tend the trail handspike; the skids are unhooked and replaced by Nos. 3, 4, 5 and 6.

The gun is shifted to the boat carriage by reversing the process already described. The commands for this last movement are: **PREPARE TO EMBARK, EMBARK; SHIFT THE HOWITZER.**

The boat would then be shoved off and manœuvred as required.

The coxswain and two men next forward of the stroke oarsmen will be left as boat-keepers.

In landing the howitzer in a surf, the boat should be anchored outside the surf, the howitzer transported aft; and the boat being backed in stern foremost, the gun is landed over the stern. It may be embarked in like manner.

Whenever the boats are hauled off by the boat-keepers, a line will be left ashore, so that they may be readily hauled on shore again.

[See Dahlgren's "BOAT ARMAMENT," for suggestions in case of landing.]

On Naval Boat Expeditions.

The Ordnance Manual (pages 95 to 98,) prescribes the manner in which boats are to form when ordered

for exercise. The *order of landing* would be probably the order of attack, two deep (page 97), in which the howitzer boats are in the first line. The interval between the boats or columns is not specified; but *for exercising*, we may prescribe 6 boats' lengths as the interval between the boats when ranged in *the first order* (page 96); this will give 3 boats' lengths for the interval between them when formed three deep; and 2 when formed two deep. The distance between *the lines* may be one boat's length when ranged in *the first order*; which will give 3 when formed three deep; and 5 when formed two deep.

In pulling for the shore, however, *under fire*, boats will open out more if found necessary.

The boats of a single 74 or frigate, when formed for landing should be so distributed, that the launches should be at either end of the line, and the 1st and 2d cutters near the centre—the latter can then land their howitzers under cover of the launches. In all cases of landing *under fire*, the operation will be facilitated by the fire of the ships or gunboats, if it is practicable.

The Ordnance Manual says: "Boats are to be provided according to the time they are to be absent, and the nature of the service they are to perform," &c.

Boats are signalled to repair alongside of the Admiral, for the following purposes:

1st. To land artillery and small-arm men; with a view to operations on shore.

2d. To attack other boats or small vessels, or to cover the landing of troops; in which latter case howitzer boats only are required.

3d. For exercise. This latter includes the manœuvring of boats as prescribed in Ordnance Manual; the

handling of boats under sail, for instruction in sailing tactics; and the handling of boats under oars, for the purpose of illustrating the manœuvres of a steam fleet.

They are fitted out as the case requires; in the first and second cases, for example, the spars, sails, provisions, &c., are not carried unless the boats are ordered on distant service; in the third case, the boats are either fully fitted out *for inspection*, or carry only their oars and sails, or their oars alone, according as they are to manœuvre as a sailing or steam fleet.

Signal books are usually prepared on board the flagship, and distributed to the fleet, giving directions for performing the evolutions, &c., &c., &c.

For the attack of small vessels, or other boats, the boats should be formed in the order of attack, two or three deep. Ordnance Manual, page 96.

On Landing a Force consisting of Small-Arm Men and Howitzers.

The arrangements necessary will depend much upon the service to be performed, and the intent with which the men are landed. In some cases they are thrown ashore for a few hours or days, to effect some particular object, in which case the boats constitute the *base* of the operations; in others, they are landed for permanent operations, and though they may still continue to draw their supplies from the shipping, they cease to consider the fleet as their refuge from defeat. In fact, the force becomes an *army*, and will be governed by the rules of war as laid down by military men.

Before sending the men ashore, it will be decided as to what provisions they are to take, and what clothes to wear. If pork is served out, it should be cooked. A certain number of men should be detailed to assist in carrying the wounded.

In forming the order of landing, the howitzer boats should be distributed along the first line; the extremities defended by the 24-pdr. howitzers.

The second line consists of the light boats, in which the small-arm men are distributed—men of the same company should be next each other; skirmishers in the wing boats; and the position of each company *in line*, as well as that of each howitzer, should be *clearly understood* by captains and lieutenants belonging to them. The officer conducting the operation would probably be in a light boat.

The howitzers should be landed alternately; each *alternate* waiting to cover the one on its right before landing, and being in turn covered by it during that operation. This will depend upon circumstances, however; the commanding officer may cover the landing of two-thirds of the howitzers with the remaining third, or may cover all the landing howitzers with the 24-pdrs., and fire of the ships. The heavy and light guns are distributed along the line when formed ashore, as found most advantageous.

As soon as the landing of the guns commences, the second line of boats pull in and land on the right of their leaders, and the officers and men jump ashore. Their muskets have been, of course, previously loaded. The howitzers afloat and ashore keep up a brisk fire from the moment they are within range. When the

boats are once well under fire, the quicker the landing is effected the better, and the howitzer boats must push on as fast as possible; small-arm men must not attempt to fire, and the howitzers not oftener than necessary; the officers must remember that the object is to *land*.

As each officer lands, he will form his men under such shelter as the landing affords, and then open fire, or advance at discretion, until ordered to take some particular ground. A reserve force stationed in the centre boats, should be formed, and this party will form under shelter if possible, and be considered the base of the manoeuvre.

The skirmishers extend or advance on either flank, seizing advantageous posts; such as woods, high ground, &c.

The officers commanding howitzers take post where they can render most service; each piece acting singly, as directed in the "School of the Piece," and extending or increasing their intervals, as the nature of the ground or the circumstances of the case require.

In performing the operation of landing, it should be recollected that no time is to be lost in striving *at too much regularity*; a certain number of the men first ashore must always dash on as soon as possible, to gain cover and room for those that are to follow. This is particularly the case when the beach is too narrow to admit of landing *together*. The men first ashore in this case constitute the *advance*, and must push on a short distance from the beach. Officers in such cases, however, must be careful not to push on so far as to endanger their being cut off from the main body.

In landing a combined force of guns and men, then,

we should endeavor, first, to arrange the infantry in such a manner that men of the same company will be near each other, and all properly found and equipped; 2d, to be certain that the order of landing, and order *after landing* are understood by all the officers. The *advance, reserve, skirmishers, &c.*, picked out, and their duties fully explained to them; 3d, after getting under fire, to push on and land as quickly as possible; the howitzers clearing the beach with canister; and 4th, to form, after landing, in the manner best suited to the object in view.

In landing, when not opposed, all boats pull in, and land their men and guns together. Light boats of the second line will always land on the starboard side of their leading boats of the first line,

In manœuvring boats under oars (except when practising steam fleet tactics) the bugle calls could well be introduced for the transmission of such simple orders as are required. The calls for changing direction, closing up, extending, &c., might be the same as those used in exercising a battery of howitzers, or the skirmishers.

In landing, the principal calls required would be: *the advance, the retreat, halt, open more, close up, commence firing, cease firing, land, &c., &c., &c.*

Embarking.

In embarking under fire, the same principles obtain as in landing. The howitzer boats, at the extremities of the line, should pull close in, and keep up a brisk fire.

The howitzers should be embarked as they were landed; the centre ones being the last to leave the shore. The wing companies embark, and then those toward the centre, and finally the centre itself. Each howitzer boat commences to fire when it can do so, but small-arms are only to be used, *if used at all*, by the boats in the first line. By this means of embarking, a cross fire is kept up, which will enable the centre to embark in safety.

The boats will retreat as fast as possible. The light boats pull off without waiting for the howitzer boats. The latter shift their howitzers aft, and send all the men possible to the oars. They will continue to fire, but as the fight is no longer equal, they must get beyond the reach of the enemy's fire as fast as they can.

If the embarkation cannot be covered by the boats at the extremities, and an officer leaves his boats with an impression that he may have to retreat under a heavy fire, he should leave a force behind to throw up temporary breastworks. A small redoubt might be constructed at each extremity of the landing place, open to the water, and howitzers mounted therein.

A knowledge of the methods of constructing breastworks, sand-bag forts, &c., would be useful to the naval officer.

On the military Operations which may be undertaken by a Naval Force.

The object of an expedition may be to seize and hold an enemy's country; and a knowledge of the different methods of attack and defence is required. The object

of the expedition may be to attack an intrenched village, to attack a post or fortified building, or to storm a fort. Information on these points is to be found in the AIDE MEMOIRE TO THE MILITARY SCIENCES, under the head of *attack*, DEFENCE, &c.

Part III. of this work contains rules for the manœuvres of batteries of howitzers, when formed as such.

Howitzers would not be formed into batteries, except in the case just cited.

In any case it is not to be understood that the pieces maintain exact intervals when actually engaged. Advantages of ground, &c., are always seized upon.

Single pieces, or sections, may be detached to any part of the line as required.

In landing a battery of pieces in order to exercise in the formations, the pieces land together, and form line immediately after landing. The right boat being *the guide*.

PART III.

SCHOOL OF THE BATTERY.

PART III.

SCHOOL OF THE BATTERY.

General Remarks.

THE Manceuvres of infantry, cavalry, and artillery, are regulated by the same general principles; but as the infantry constitutes the main body of an army, its movements necessarily control those of the other arms. In this work the infantry forms of command have been adopted for the artillery, as far as the difference between the two services would permit.

A battery executes nearly the same manceuvres as a battalion of infantry, but with less precision; for its elements cannot be moved with the same accuracy as platoons of well-instructed infantry.

No rules can be laid down for conducting batteries to the positions they are to occupy; for the order, gait and direction of each battery are modified by the configuration of the ground to be passed over, as well as by the march of the infantry and cavalry. The artillery proceeds to the execution of its orders in the easiest and most expeditious manner. The proper employment of

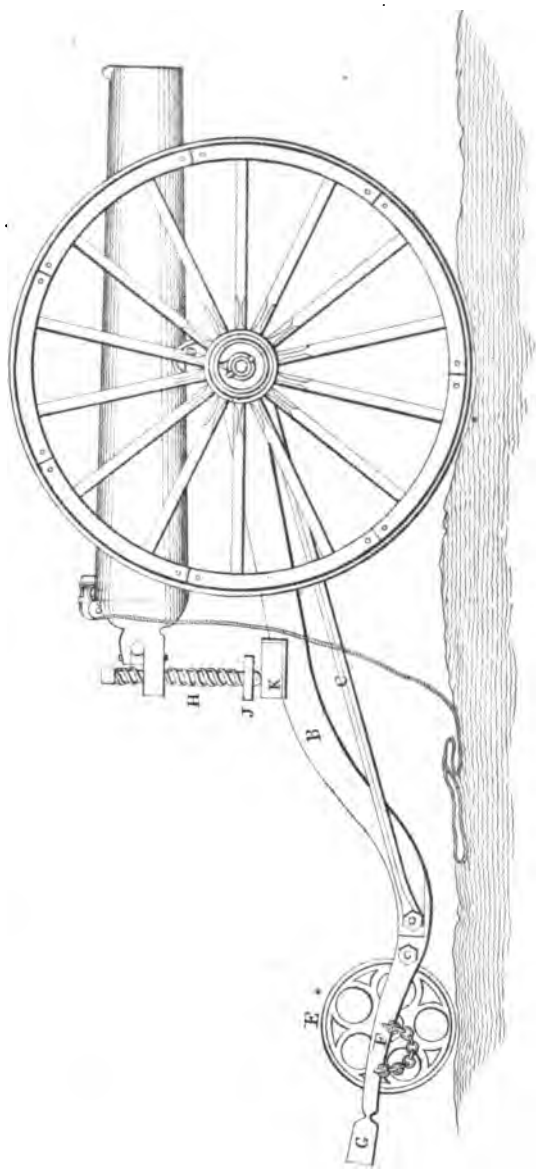
this arm, according to the situation of the ground, and the circumstances of the case, must ever be kept in view in all orders issued to it.

No notice is taken of inversions, in any of the orders, either in column, in line, or in battery. The most simple and rapid formations are always adopted. But one wheel is admitted. The pivot carriage preserves its gait, while the others regulate theirs according to their distances from it; the guide being always on the pivot-flank.

No general or special guides are used. The chiefs of pieces are the guides of the carriages to which they are attached. And each becomes the guide of the line or column whenever his carriage occupies the position to which the movements are referred.

The cautionary command, *ATTENTION*, may be used at the discretion of the captain. The commands of the chiefs of sections are more numerous, and those of the captain are more frequently repeated, than in other arms of service, on account of the noise of carriages and extent of command.

The three orders, in column, in line, and in battery, are so established as to occupy the least possible space, and to require the least ground for their formations. The distance between two carriages in column of pieces is one yard, and in column of sections eleven yards. The interval is so calculated that the column may be readily formed into line. The distance from the muzzle of the piece to the end of the drag-rope must be ten yards; the drag-ropes being cut with this object in view.



Mancœuvres of a Field Battery.

The mancœuvres of a field battery are intended to furnish the instruction required for conducting its movements and formations, in all situations in which it can be employed.

Each movement should be repeated until it is fully understood, and executed without hesitation, by all who co-operate in its performance.

In the following mancœuvres, the crews are supposed to draw their pieces, and the intervals are calculated upon that supposition. Should supernumeraries be used for that purpose, the intervals must be increased.

The movements are described for one flank only. They may be executed by the other flank, according to the same principles and by inverse means.

Composition of the Battery of Mancœuvre.

Plate 5.

34. The battery of mancœuvre is composed of four, six, or eight howitzers, and the officers and men required for their service. Each piece is drawn by twelve men, and the officers and men are as follows (supposing the battery to be composed of six pieces):

One captain, who commands the battery.

Three lieutenants; the first in rank commanding the right section, the second the left, and the third the centre.

When half-batteries are formed, the first commands the right, and the second the left.

Six warrant or petty officers; each charged with guiding and superintending a piece.

Six quarter gunners.

Twelve petty officers; to act as 1st and 2d captains of pieces.

Six detachments; each containing ten men.

One trumpeter or bugler.

35. The battery is divided into three sections, denominated the right, left, and centre sections; each containing two pieces. In each section the pieces are denominated right piece and left piece.

The battery is also divided into half batteries, denominated right and left half-battery.

36. The word *piece*, applies to the howitzer, and the word *carriage* to the *piece and crew* at the drag-rope, comprehending a distance of ten yards.

37. The *front of a battery*, in the order in battery, is the front of the line of pieces. In all other formations it is the front of the leaders at the drag-rope.

38. The *right or left* of a battery is always that of the actual front.

39. The *interval* is a space measured parallel to the front.

40. The *distance* is a space measured in depth, or perpendicular to the front.

41. The *measures* of intervals and distances are given in yards, and express the vacant spaces between the component parts of the battery.

42. The object of a *right or left wheel*, is to give the carriage a direction perpendicular to the one it had before.

43. The object of a *right or left oblique* is to give the carriage a direction inclined 45° to the right or left of the one it had before. The oblique of a carriage is in fact, one-half of a right or left wheel.

Fig. 2.

Order in Column

of pieces

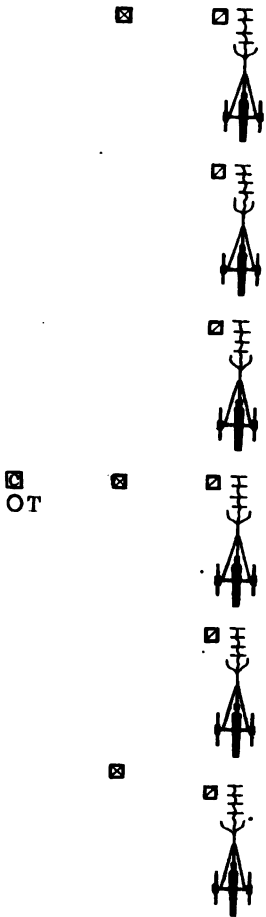
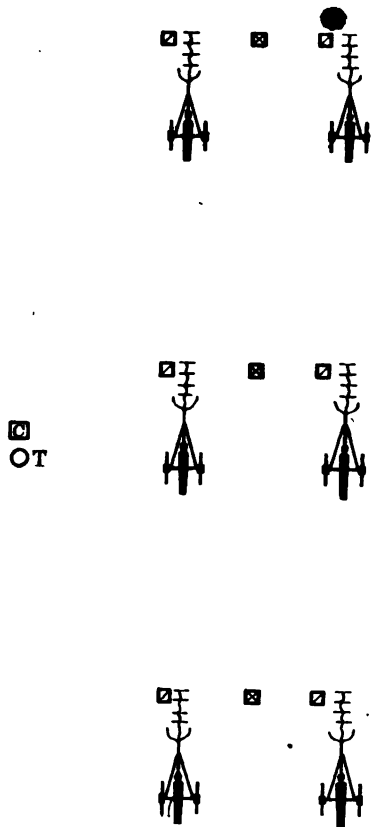


Fig. 1.

of Sections.



44. The object of an *about*, is to establish the carriage on the same ground, but in the opposite direction; having the leaders at the drag-rope where the hinder part of the carriage was before. For the proper execution of this movement, the men at the drag-rope incline to the right (or left), the breadth of the carriage, advance ten yards, and wheel short around to the left (or right).

45. The *alignment* is made on the leaders at the drag-rope, except in battery, when it is made on the wheels.

46. In giving commands, the strength of the voice should be proportioned to the length of the line. When a chief of section does not hear the commands, he regulates his movements by what he sees executed by an adjoining chief.

47. Trumpet or bugle calls are used instead of commands, whenever they can be advantageously introduced.

Formations of the Battery.

The three following orders constitute the different formations of the battery of manœuvre.

1. ORDER IN COLUMN $\left\{ \begin{array}{l} \textit{of sections.} \\ \textit{of pieces.} \end{array} \right.$
2. ORDER IN LINE.
3. ORDER IN BATTERY.

48. (*Pl. 6, fig. 1.*) The *order in column of sections*, is that in which the carriages stand in two lines, each section covering the one in front of it.

The captain is generally 14 yards from the column,

and opposite to its centre; but during the manœuvres he moves wherever his presence may be most necessary, and where his commands may be best heard.

Each chief of section is in line with the leaders at the drag-rope, and midway between them.

Each chief of piece is on the left and near the leaders at the drag-rope.

The trumpeter is near the captain.

The interval between the carriages is $10\frac{1}{2}$ yards. The distance between the carriages is 12 yards.

49. (*Pl. 6, fig. 2.*) The *order in column of pieces* is that in which the carriages stand in one line, each piece covering the one in front of it.

The captain is 14 yards from the column, and opposite to its centre.

The chief of the leading section places himself near the chief of the leading piece, and on his left. The other chiefs of sections are 4 yards from the left flank, abreast the centres of their respective sections.

Each chief of piece is on the left, and near the leaders at the drag-rope.

The trumpeter is near the captain.

The distance between the carriages is 1 yard.

Order in Line.

50. (*Pl. 7, fig. 1.*) The *order in line* is that in which the pieces form one line, the men all facing in one direction; the pieces secured for the march and drag-ropes manned.

The captain is generally 4 yards in front of the centre.

Fig. 1.

Order in line

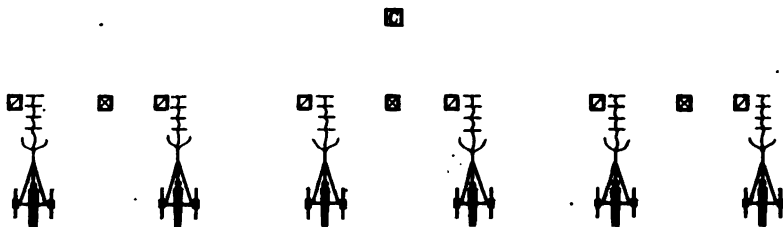
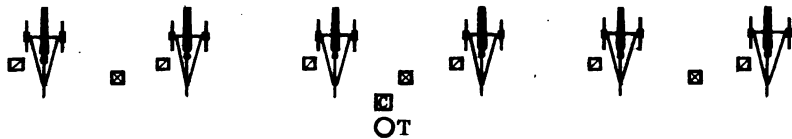


Fig. 2.

Order in Battery



Each chief of section is in line with the leaders at the drag-ropes and midway between them.

Each chief of piece is in the same position as in column.

The trumpeter, when he does not accompany the captain, is in line with the leaders at the drag-ropes, and 4 yards from the right flank.

The interval between the carriages is $10\frac{1}{2}$ yards, $1\frac{1}{2}$ drag-ropes.

Order in Battery.

51. (*Pl. 7, fig. 2.*) The *order in battery* is that in which the pieces are prepared for firing, the muzzles being toward the enemy.

The captain is generally on the left of the chief of the centre section.

Each chief of section is habitually in the centre of his section, 5 yards to the rear of the wheels.

Each chief of piece is outside the file, on the left of his piece, but near it, and opposite the middle of the trail handspike.

The trumpeter is near the captain.

The interval between the carriages is $10\frac{1}{2}$ yards.

The regular formation in battery should be always preserved in the manœuvres. But on the field of battle the front would be commonly more extended; the pieces being posted so as to obtain the greatest advantage from the nature of the ground, and the ammunition boxes sheltered as much as possible.

52. During the manœuvres, the captain is followed by a trumpeter, who must not leave him. On receiving

an order from the captain, for that purpose, he takes the place assigned him in the order in line.

53. The *double column* is a particular case of formation in column with a front of two pieces. It is formed on the centre section as head of the column; each of the other sections being in column of pieces in rear. When the battery contains but four pieces, the double column is formed upon the two centre pieces as before.

Measures of the Elements Composing a Battery, and of its Formations.

54. The measures given in the three orders of the battery, and those which will be given hereafter, result from the dimensions of the different elements embraced. Those dimensions are given in the following table.

The numbers adopted will be found to differ slightly from the exact measures, but as it is extremely difficult, and not very important, to secure precision in the manœuvres, the difference is of little consequence. The breadth of the light howitzer is rather less than that of the heavy gun, but the difference is too slight to be noticed.

	HEAVY 12-PDR.	
	DEPTH.	FRONT.
Piece drawn by 10 men	10 yds.	5 feet.
Piece in battery with handspike	14 feet.	5 "
Detachment of 12 cannoneers, in two ranks, with chief on the right.....	3 "	15 "
Column of sections.....	52 yds.	14 yds.
Line of battle	10 "	62½ "
Line in battery	25 "	62½ "
Section in line	10 "	14 "
Section in battery	25 "	14 "

Manning the Battery.

55. The men fall in by crews and are marched to the battery as prescribed in No. 27.

The battery being in line, if the captain wishes to move by the right, he commands:

1. *By piece—from the right—front into column.*
2. MARCH.

At the command MARCH, the right piece marches direct to the front, and the captain indicates the direction it should take. The other pieces follow the movement of the right piece, each so regulating its march by that which precedes it as to march in the same direction, and one yard behind. Each chief of section directs the march of his pieces, which are so conducted by their chiefs as to enter the column by the most simple movement.

The captain, chiefs, and trumpeter, take post as in No. 49.

The battery may be moved by the left, according to the same principles, and by inverse means. The commands are:

1. *By piece—from the left—front into column.*
2. MARCH.

56. The battery may be manœuvred either in column of pieces or column of sections; though the latter is to be preferred. The principles and commands are the same for both.

To Halt.

57. To halt the battery, when marching in column, the captain commands:

1. *Column.*
2. HALT.

At the second command, repeated by the chiefs of sections, all the pieces are immediately halted; the drag-ropes being stretched taut.

58. To change the cadence of the step, the captain commands:

1. *Quick-time.*
2. MARCH. Or,
1. *Double quick-time.*
2. MARCH. &c., &c.

To Form Sections.

59. The battery being in column of pieces, in march or at a halt, to form sections, by gaining ground to the left, the captain commands:

1. *Form sections—left oblique.*
2. MARCH.
3. *Guide right.*

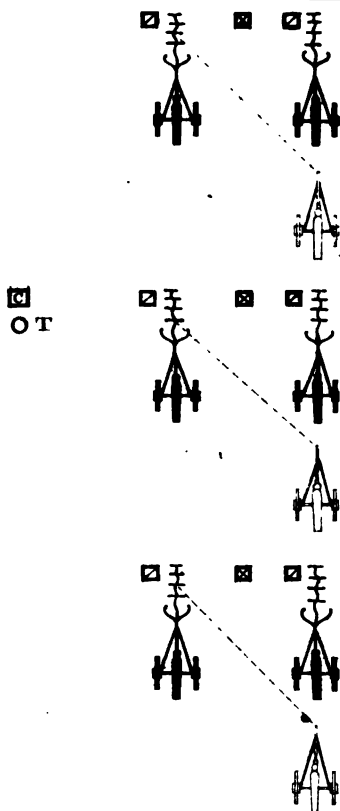
(*Pl. 8, fig. 1.*) The chiefs of sections repeat the commands in succession after the captain. At the command MARCH, the 2d, 4th, and 6th pieces oblique to the left until abreast of the 1st, 3d, and 5th, and gain their interval of $10\frac{1}{2}$ yards. They quicken the step when sections are formed in march.

The captain, chiefs, and trumpeter take post as prescribed in No. 48.

Sections are formed by gaining ground to the right, by the commands:

1. *Form sections—right oblique.*

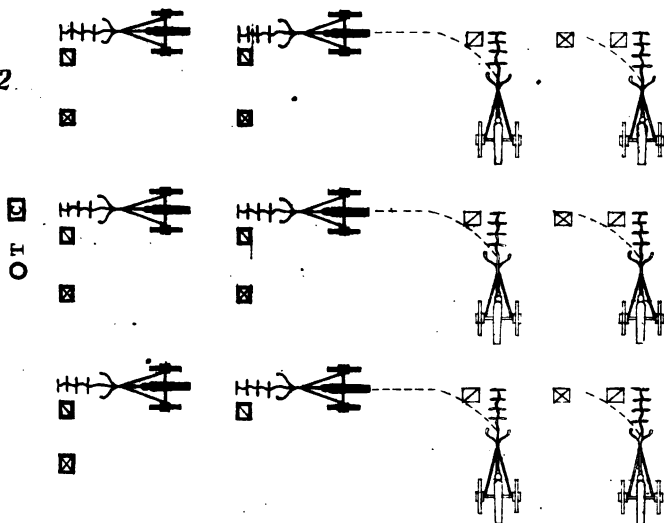
Fig. 1.



1. Form Sections—
left oblique.
2. March.
3. Guide right.

1. "Column by the left Flank"
2. "March."

Fig. 2.



2. MARCH.
3. *Guide left.*

To March in Column.

60. The battery being in column, at a halt, to advance, the captain commands :

1. *Column—forward.*
2. MARCH.
3. *Guide left (or right).*

The commands, *Forward—MARCH—Guide left (or right)*, are repeated by the chiefs of sections. At the command MARCH, all the pieces advance, the guide maintains the direction, and the pieces preserve their intervals and distances.

To March by a Flank.

61. The battery being in column of sections, in march or at a halt, to gain ground to the left, the captain commands :

1. *Column—by the left flank.*
2. MARCH.

(*Pl. 8, fig. 2.*) The commands *by the left flank—MARCH*, are repeated by the chiefs of sections. At the command MARCH, each piece wheels at once to the left. When the wheel is nearly completed, the captain commands :

1. FORWARD.
2. *Guide right.*

These commands are repeated by the chiefs of sections.

At the command FORWARD, all the pieces march direct to the front.

The line is regularly established, and the pieces aligned in each rank.

The chiefs of the right and centre sections take their places between the leading carriages, as in line. The chief of the left section is five yards on the left, and in line with the leaders at the drag-rope of his left piece.

To cause the battery to resume its original direction, the captain commands:

1. *Battery—by the right flank.*
2. MARCH.
3. FORWARD.
4. *Guide left.*

The commands, *By the right flank—MARCH—FORWARD—Guide left*, are repeated by the chiefs of sections.

After the flank march, to march the battery in a direction opposite to the original one, the captain commands:

1. *Battery—by the left flank.*
2. MARCH.
3. FORWARD.
4. *Guide right.*

The flank march to gain ground to the right is executed according to the same principles, and by inverse means.

In each case the captain changes his direction to the left or right, and conforms to the movements of the battery.

If the battery is formed in column of pieces, the commands and movements are the same. The chiefs of sections taking post as in line.

Oblique March.

62. The battery being in column, in march or at a halt, to cause it to march obliquely to gain ground to the front and left, the captain commands :

1. *Column—left oblique.*
2. MARCH.
3. *Guide right.*

The chiefs of sections repeat the commands, *Left oblique—MARCH—Guide right.* At the command MARCH, all the carriages oblique at once to the left (No. 43), and march direct to the front in the new direction ; moving in parallel lines, dressing by the right, and preserving their intervals from that flank.

In obliquing, the leaders at the drag-ropes in each rank are on a line parallel to the original front of the column.

The officers conform to the movement, and preserve their relative positions.

To resume the original direction, the captain commands: FORWARD.

This command is repeated by the chiefs of sections, and the pieces resume the original direction by obliquing to the right.

If the captain wishes to halt the column for the purpose of rectifying its alignments, intervals, or obliquity, he commands :

1. *Column.*
2. HALT.

And to resume the march in the oblique direction.

1. *Column.*
2. MARCH.
3. *Guide right.*

The commands **HALT—MARCH—*Guide right***, are repeated by the chiefs of sections.

The right oblique is executed according to the same principles, and by inverse means.

In each case the captain changes his direction to the left or right, and conforms to the movements of the battery.

About in Column.

63. The battery being in column, in march, or at a halt, to face it to the rear, the captain commands:

1. *Pieces—left about.*
2. **MARCH.**

These commands are repeated by the chiefs of sections, and at the second all the pieces execute the about (No. 44). When the movement is about being completed the captain commands:

*Column—HALT, or FORWARD;—*Guide right (or left)**; the commands **HALT, or FORWARD—*Guide right (or left)***, are repeated by the chiefs of sections.

To Change Direction in Column.

64. The battery being in column, in march or at a halt, to cause it to change direction to the left, the captain commands:

Head of column to the left.

The chief of the leading section commands: *Left wheel—MARCH*; and afterward, **FORWARD.**

At the command **MARCH**, the pivot piece executes

the wheel without changing the gait. The piece on the wheeling flank, wheels in such a manner as to conform to its movement, increasing the gait, and preserving the interval. At the command FORWARD, the pivot carriage moves direct to the front, and the other resumes its original gait after completing the wheel and arriving upon the same line.

Each of the other sections, on arriving at the point where the first wheeled, executes the same movement, and by the same commands from its chief.

Each chief of section must give the command *Left wheel* in time to command MARCH, when the leaders at the drag-rope arrive at the wheeling point, and the command FORWARD must be given as soon as the pivot carriage has entered the new direction.

The change of direction to the right is executed according to the same principles and by inverse means.

An oblique change of direction is executed according to the same principles, by the command :

Head of column—(left or right) half wheel.

The chiefs of sections command, successively: *Left (or right) half wheel*—MARCH—FORWARD; the command FORWARD being given, in this case, when the pivot carriage of each section is about finishing the left or right oblique.

To Diminish the Front of a Column on the March.

65. The battery marching at a walk, in column of sections, to form column of pieces from the right, the captain commands :

1. *By the right—break sections.*
2. MARCH.

These commands are repeated by the chiefs of sections. At the command MARCH, the right carriages continue to march at a walk, and the others oblique into their positions in column of pieces.

When the column is marching at double quick time, the column of pieces is formed according to the same principles, and by the same commands.

When the column is at a halt, the movement is executed as prescribed for a column marching, the right carriages moving forward 12 yards at the command MARCH.

This formation is executed from the left, according to the same principles and by inverse means.

To Pass from the Order in Column to the Order in Line, and the Reverse.

FORWARD INTO LINE.

66. The battery being in column at a halt, to form it into line on the head of the column, gaining ground to the left, the captain commands:

1. *Forward into line—left oblique.*
2. MARCH.
3. *Guide right.*
4. FRONT.

(*Pl. 9. fig. 1.*) At the first command, the chief of the leading section commands: *Section—forward*; and those of the other sections, *Section—left oblique*. At the command MARCH, repeated by the chiefs of sec-

1. "Forward into line - left oblique"
2. "March."

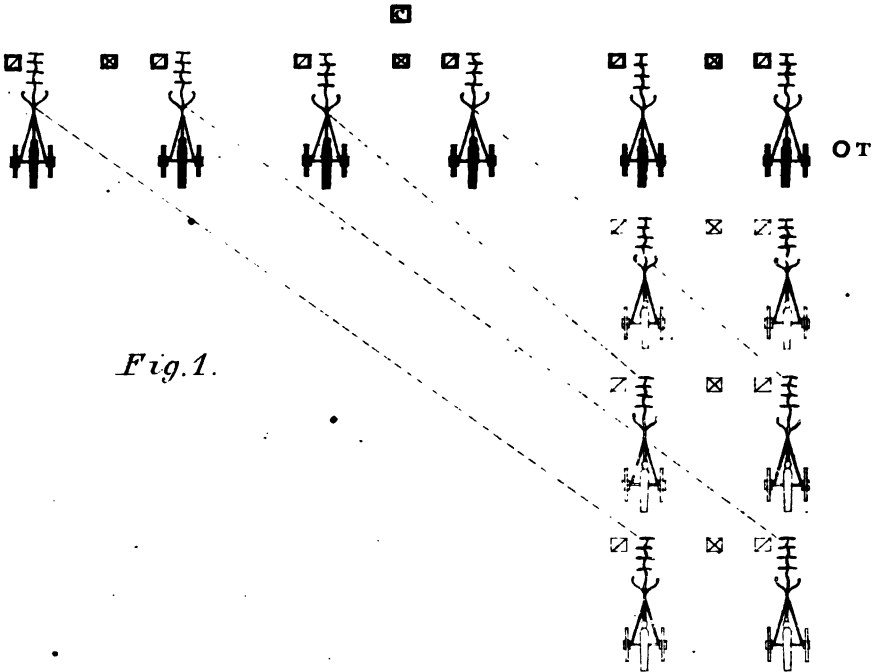


Fig. 1.

In to line faced to Rear - left oblique - March.

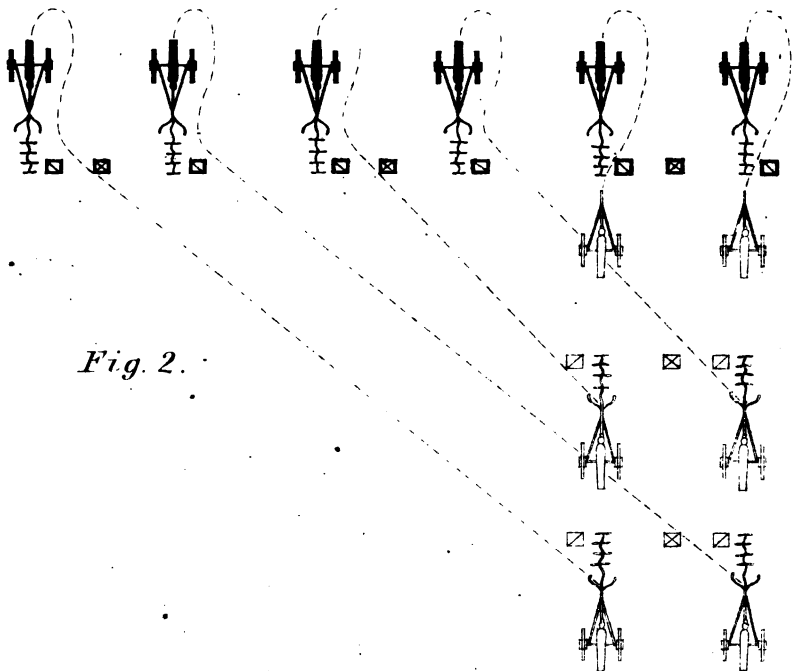


Fig. 2.

tions, the leading section moves to the front, and its chief repeats the command for the guide. After advancing ten yards, he commands: *Section—HALT;—Right—DRESS.*

Each of the other chiefs of sections repeats the command for the guide, and conducts his section by a left oblique, until by the direct march it may gain its proper interval from the section on its right. He then commands, FORWARD, and when within one yard of the line, *Section—HALT;—Right—DRESS.* When the battery is aligned the captain commands: FRONT.

The movement is executed on the opposite flank according to the same principles and by inverse means. In this case the commands are:

Forward into line—right oblique—MARCH; Guide left—FRONT.

The formation forward into line by a right or left oblique, is executed in a similar manner when the column is in march. In this case, the chief of the leading section gives no command except for the guide, until he has advanced the distance before prescribed. He then halts his section as before.

After the battery is aligned, the captain commands: FRONT. He continues the march by the commands:

1. *Battery—forward.*
2. MARCH.
3. *Guide right (or left.)*

The movement is executed according to the same principles, and by the same commands from a column of pieces. The chief of the leading section commanding, *Right piece—forward—left piece—left oblique.*

To Form Line Faced to the Rear.

67. The battery being in column at a halt, to form it into line faced to the rear, on the head of the column, gaining ground to the left, the captain commands:

1. *Into line faced to the rear—left oblique.*
2. MARCH.
3. *Guide right.*
4. FRONT.

(*Pl. 9, fig. 2.*) At the first command, the chief of the leading section commands: *Section—forward*; and those of the other section: *Section—left oblique*. At the command MARCH, repeated by the chiefs of sections, the movement is executed as in No. 66, with the exception of the alignment. When the leading section has advanced ten yards, it is halted by its chief until the centre section arrives upon the same line. He then commands: *Pieces—left about—MARCH*; and when the about is nearly completed, *Section—HALT—Left—DRESS*.

The centre section is halted upon the line in like manner until the left section comes up, and is then faced about and aligned by the same commands.

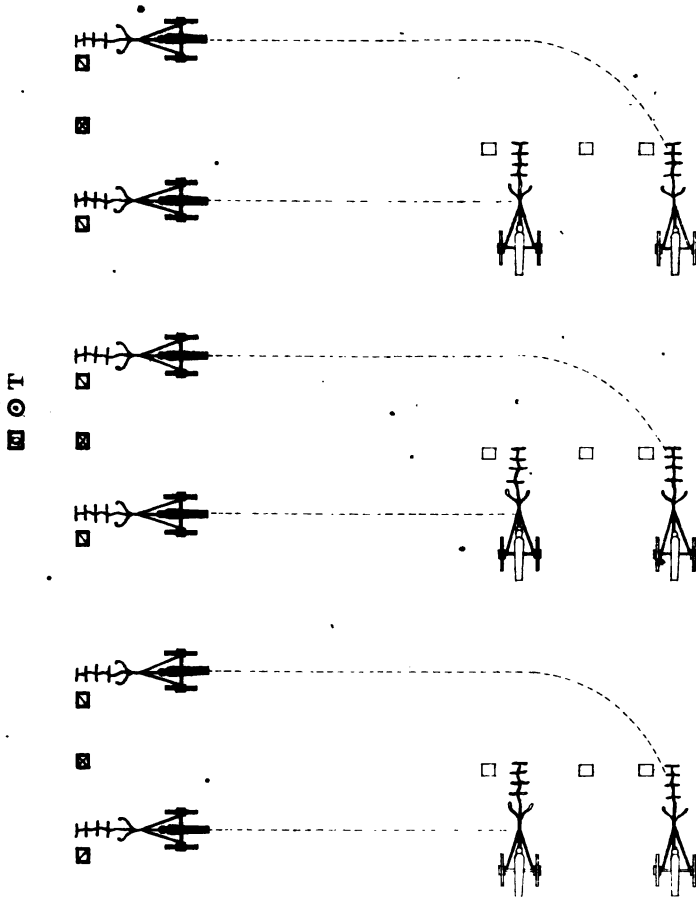
When the left section arrives upon the line, it is wheeled about before halting, and then aligned like the others.

When the centre and left sections are wheeled about, the commands, *HALT—Left—DRESS*, should be given if possible when they are one yard in rear of the line on which the leading section is established.

When the battery is aligned, the captain commands: FRONT.

The movement is executed on the opposite flank ac-

1 "Left into line wheel"
2 "March".



ording to the same principles, and by inverse means. In this case the commands are: *Into line faced to the rear—right oblique—MARCH*;—*Guide left—FRONT*.

The formation into line faced to the rear by a right or left oblique is executed in a similar manner when the column is in march.

The movement is executed according to the same principles from a column of pieces.

To Form Line to the Right or Left.

68. The battery being in column, in march or at a halt, to form it into line to the left, the captain commands:

1. *Left into line wheel.*
2. MARCH.
3. *Battery—HALT.*
4. *Left—DRESS.*
5. FRONT.

(Pl. 10.) At the first command the chiefs of sections command: *Section—left wheel*; and at the second, which they repeat, all the sections wheel to the left. Each chief of section commands: *Forward—Guide left*, as soon as his pivot carriage has taken the new direction.

When the sections are in line, the captain commands: *Battery—HALT—Left—DRESS*. The commands, HALT—*Left—DRESS*, are repeated by the chiefs of sections, and when the alignment is completed, the captain commands: FRONT.

The battery is formed into line to the right according to the same principles and by inverse means.

The movement is executed from a column of pieces according to the same principles, and by the same commands.

To Form Line to the Right or Left.

69. The battery marching in column, to form it into line on the right, the captain commands:

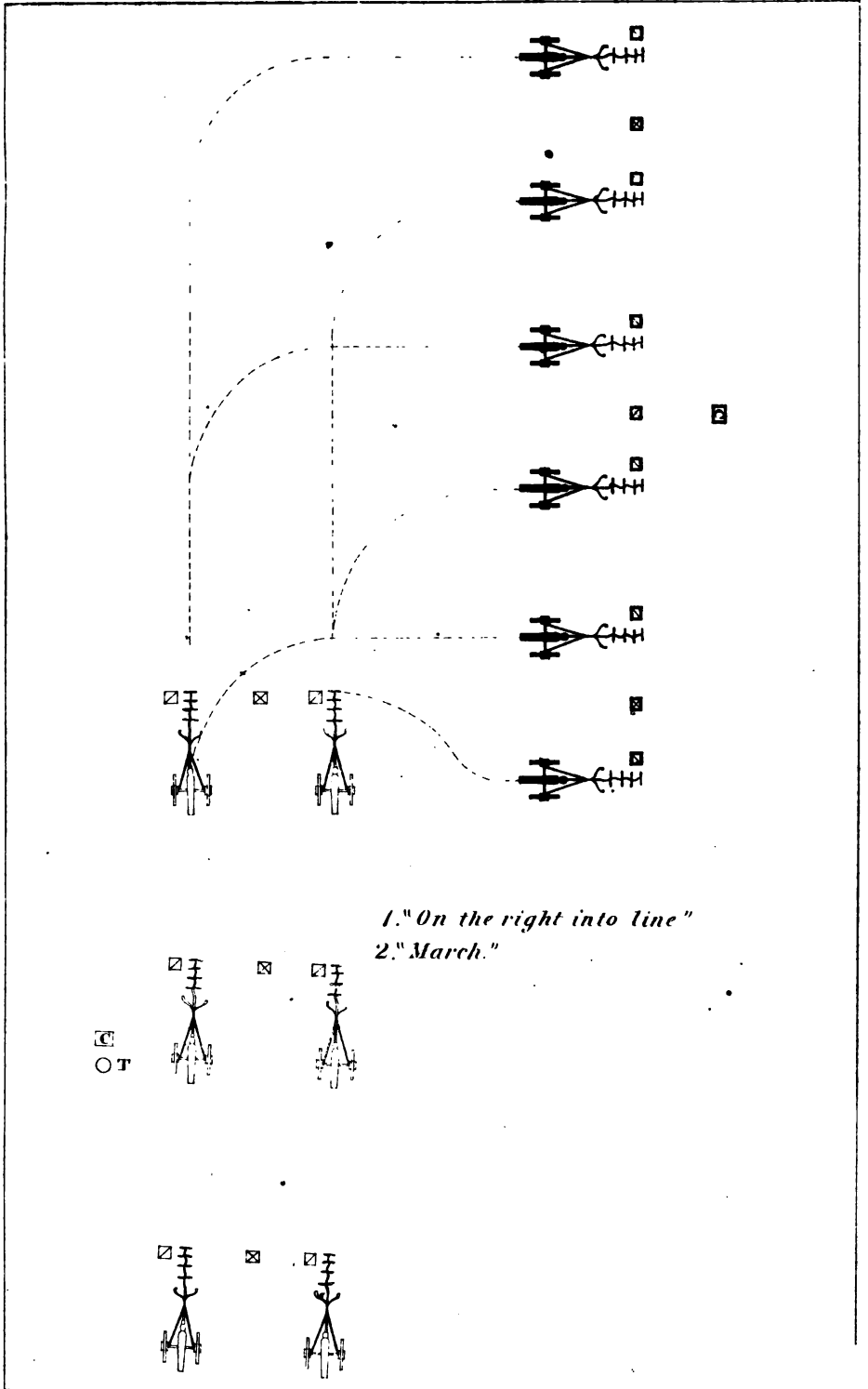
1. *On the right into line.*
2. MARCH.
3. *Guide right.*
4. FRONT.

(Pl. 11.) At the first command, the chief of the leading section commands: *Section—right wheel*; and at the second, which he repeats, the section wheels to the right. As soon as the pivot carriage enters the new direction he commands: FORWARD—*Guide right*; and as the section completes the wheel and un.masks the column, he commands: *Section—HALT—Right—DRESS.*

The chiefs of the other sections repeat the command for the guide, and their section continues to move forward. As each section passes the one preceding it in the formation, its chief establishes it on the line, with the proper interval, by the same commands. The commands, *Section—HALT—Right—DRESS*, are given when the section is one yard in rear of the line.

When the battery is aligned the captain commands: FRONT.

The line is formed on the left according to the same principles and by inverse means. The commands are: *On the left into line—MARCH—Guide left—FRONT.*



1. "On the right into line"
2. "March."

When the column is at a halt, the line is formed on the right or left in the same manner. In this case the chiefs of the two rear sections command: *Section—forward*, and afterward repeat the commands, **MARCH—Guide right (or left)**.

The line is formed from a column of pieces, according to the same principles.

To Break into Column to the Front.

70. The battery being in line at a halt, to break into column to the front from the right, the captain commands:

1. *By section from the right—front into column.*
2. **MARCH.**
3. *Guide left.*

(*Pl. 12.*) At the first command, the chief of the right section commands: *Section—forward*; and those of the other sections, *Section—right oblique*. At the command **MARCH**, repeated by the chief of the right section, that section moves forward, and its chief repeats the command for the guide.

Each of the other chiefs of sections repeats the commands, **MARCH—Guide left**, after the section on his right has commenced the movement, and when his leaders at the drag-ropes are passed by the wheels of the left carriage of that section. After obliquing sufficiently to gain the rear of the preceding section, he commands: **FORWARD**.

The movement is executed from the left according to the same principles, and by inverse means.

A column of pieces is formed in the same manner by the commands :

By piece from the right—front into column. MARCH.

To Break into Column to the Rear.

71. The battery being in line, in march or at a halt, to break into column to the rear from one of the flanks, the captain executes an about, then halts the battery, and breaks it into column to the front by the preceding manœuvre.

To Break into Column to the Right or Left.

72. The battery being in line, in march or at a halt, to break it into column to the left, the captain commands :

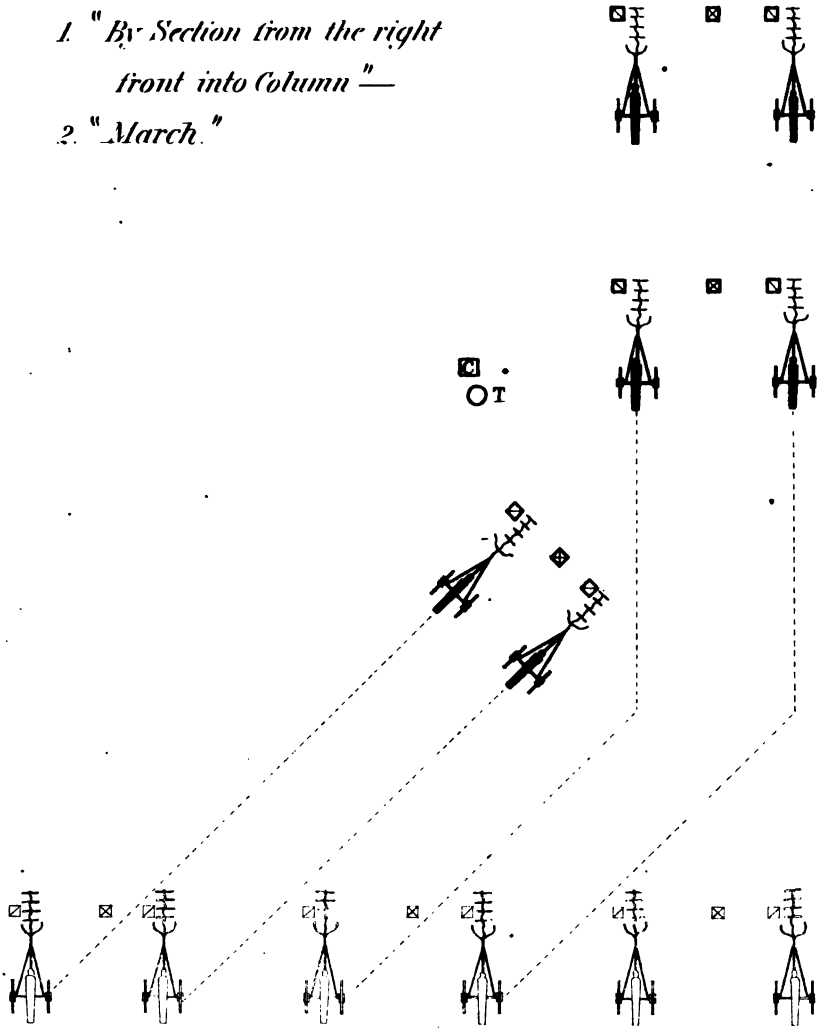
1. *By section—left wheel.*
2. MARCH.
3. FORWARD.
4. *Guide left.*

At the first command, the chiefs of sections command : *Section—left wheel* ; and at the second, repeated by them, all the sections wheel to the left. When the wheels are nearly completed the captain commands : FORWARD—*Guide left* ; the chiefs of sections repeat the commands, and close up to the proper intervals.

When the column is not to advance, the command *Column—HALT*, is substituted for FORWARD—*Guide left*.

The battery is broken into column to the right according to the same principles and by inverse means.

1. "By Section from the right front into Column"—
2. "March."



A column of pieces is formed by the commands :

1. *By piece—left wheel.*
2. MARCH.
3. FORWARD (OR HALT).

**To Break into Column to the Front from one Flank,
to March toward the Other.**

73. The battery being in line at a halt, to break from the right to march to the left, the captain commands :

1. *By section—break from the right—to march to the left.*
2. MARCH.
3. *Guide left.*

(Pl. 13.) At the first command, the chief of the right section commands: *Section—forward*; and at the second, which he repeats, the section moves forward, and he commands: *Guide left*. After advancing ten yards he changes the direction to the left by the commands: *Section—left wheel—MARCH—FORWARD*.

Each of the other chiefs of sections commands: *Section—forward*, in time to command MARCH, when the section preceding his own arrives in front of him. He then manœuvres his section as prescribed for the chief of the right section.

The battery is broken from the left to march to the right, according to the same principles and by inverse means.

To break into column of pieces, the commands are :

1. *By piece—break from the right—to march to the left.*
2. MARCH.

The chiefs of sections command: *Right piece*—FORWARD; and the column is formed according to the same principles.

To Break into Column to the Rear from one Flank, to March toward the Other.

74. The battery being in line at a halt, to break to the rear from one flank to march toward the other, the captain first executes an about. He then halts the battery and executes the preceding manœuvre.

To Break into Column to the Front, when the Battery is Marching in Line.

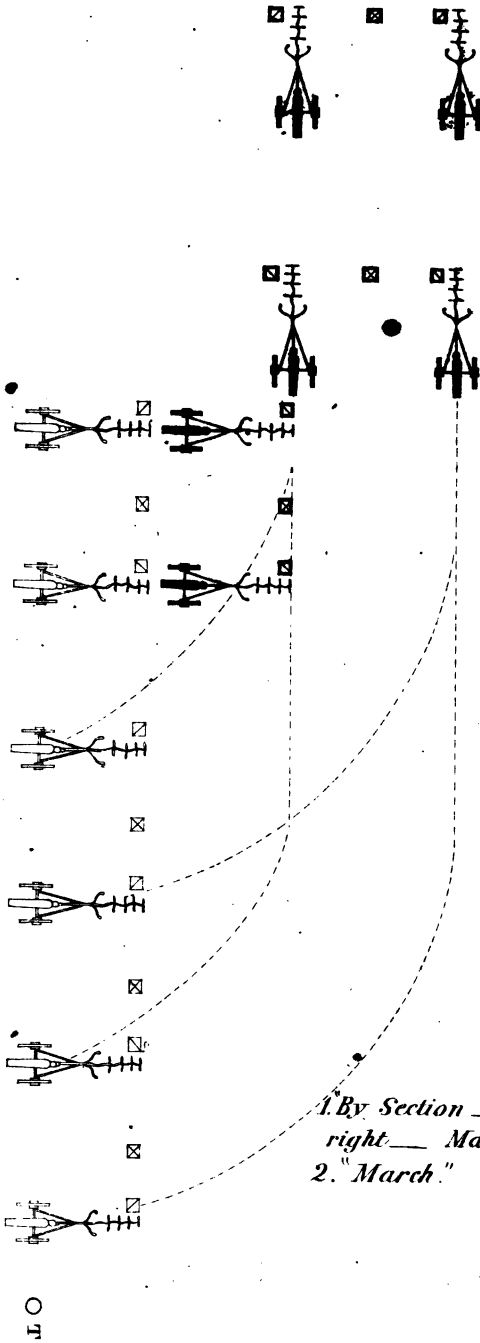
75. The battery marching in line, to break into column to the front from the right, the captain commands:

1. *By the right—break into sections.*
2. MARCH.
3. *Guide left.*

The chief of the right section repeats the command for the guide, and his section continues to move at the same gait. At the command MARCH, the other sections mark time, at the command, *Section*—MARK TIME, from their chiefs, and are afterward put in motion successively, oblique, and enter the column as prescribed in No. 70.

The battery is broken into column from the left, according to the same principles and by inverse means.

A column of pieces is formed according to the same principles.



1. By Section — break from the right — March to the left.
 2. "March."

○ J

To Form Line Advancing.

76. When the battery is marching in column, to form it into line, gaining ground to the left, and continue the march, the captain commands:

1. *Form line advancing—left oblique.*
2. MARCH.
3. *Guide right.*

The chief of the leading section repeats the command for the guide, and his section continues to move forward. The chiefs of the other sections command: *Section—left oblique—double quick.* The command MARCH is repeated by the same chiefs, and when the oblique movement is commenced, they repeat the command *Guide right.* Each chief commands: FORWARD, as soon as his section has obliqued sufficiently to the left, and *common time*, in time to command MARCH, as it arrives on the line.

The movement is executed so as to gain ground to the right, according to the same principles and by inverse means.

The line is formed from a column of pieces according to the same principles.

To Form Double Column on the Centre Section.

77. The battery being in a line at a halt, to form double column on the centre section, the captain commands:

1. *Double column on the centre.*
2. MARCH.
3. *Guide right (or left).*

(*Pl. 14, fig. 1.*) At the first command, the chief of the centre section commands: *Section—forward*; the chief of the right section: *Section—left oblique*; and the chief of the left section: *Section—right oblique*. At the command MARCH, repeated by the chief of the centre section, that section marches to the front, and its chief repeats the command for the guide.

When the wheels of the pieces of the centre section have passed the leaders at the drag-ropes of the other sections, the chiefs of those sections command: MARCH, and the sections commence the oblique.

When the piece nearest the column is about entering it, in each of these sections, the chief of the right section commands: *By the left—break section—MARCH*; and the chief of the left, *by the right—break section—MARCH*. The right and left sections, without change of gait, then form into column of pieces in rear of the right and left carriages of the centre section.

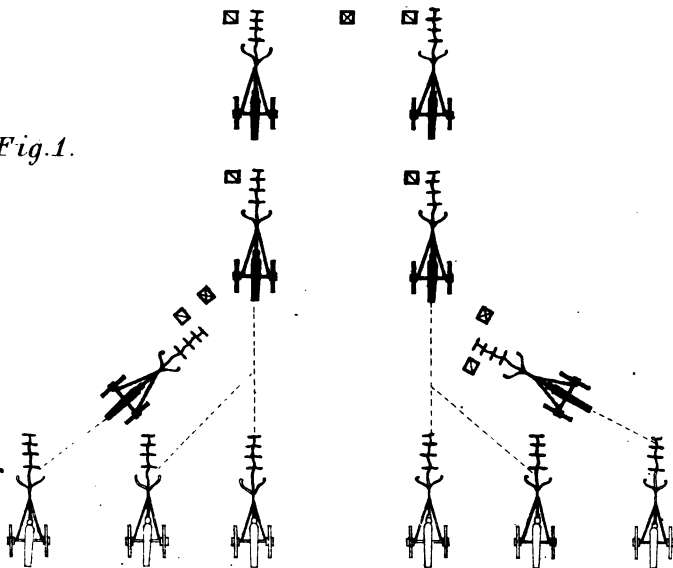
The chiefs of the right and left sections, are careful to make their pieces enter the column at the proper time; and when the column is formed, they place themselves outside of it, four yards from the centres of their respective sections.

The movement is executed according to the same principles, when the battery is in motion.

To form the double column with a battery of four pieces, the captain gives the same commands as with a battery of six. The right section is broken into column of pieces by the left, and the left section by the right. The chiefs of sections place themselves on the outer flanks of the column, abreast the leaders of the leading piece. The senior chief repeats the command for the

1 "Double Column on the Centre"
2 "March."

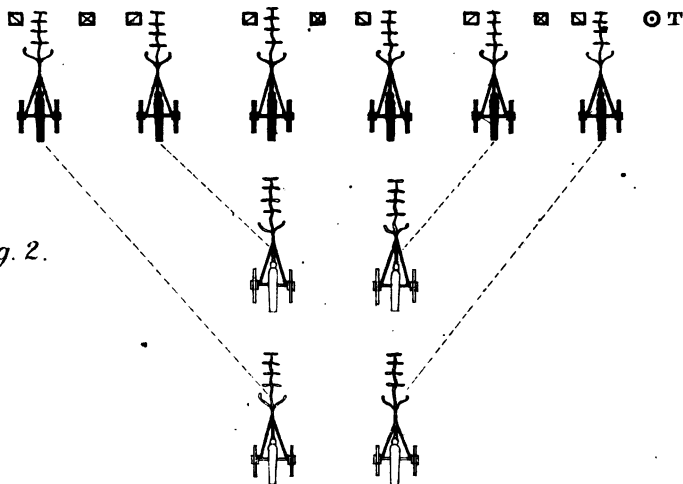
Fig. 1.



"Forward into line — March," or
"Form line advancing — March."

□

Fig. 2.



guide, and gives such other commands as are required for the head of the column; the leading pieces moving as a section for the time being.

To Deploy the Double Column into Line to the Front.

78. The battery being in double column at a halt, to form it into line to the front, the captain commands:

1. *Forward into line.*
2. MARCH.
3. FRONT.

(*Pl. 14, fig. 2.*) The centre section remains halted. At the first command, the chief of the right section commands: *Section into line—right oblique*; the chief of the left section: *Section into line—left oblique*. At the command, MARCH, repeated by these chiefs, the flank sections oblique to the right and left: and as their pieces arrive in rear of their proper places on the line, they move forward, halt, and dress toward the centre without command.

As soon as the battery is aligned the captain commands: FRONT.

When the column is marching, the movement is executed in the same manner. The commands are:

1. *Form line advancing.*
2. MARCH.
3. *Guide right (or left.)*

The centre section slackens the pace until the others are in line, if necessary.

When the battery consists of four pieces, the double column is deployed into line to the front by the same commands as when it consists of six.

To Form the Double Column into Line to the Right or Left.

79. The battery being in double column at a halt, to form it into line on the right the captain commands:

1. *To and on the right into line.*
2. MARCH.
3. FRONT.

At the first command the chief of the leading section commands: *Section—right wheel*; and the other chiefs of sections: FORWARD. At the second, repeated by those chiefs, the leading section wheels to the right, and is established on the line. The other pieces advance, wheel to the right in succession as they arrive opposite their places, establish themselves on the line, and dress upon the pieces already aligned. When the alignment is completed the captain commands: FRONT. When the column is marching the line is formed to the right in the same manner, except that the chiefs of the flank sections omit the commands, FORWARD—MARCH.

The line is formed to the left according to the same principles, and by inverse means.

When the battery consists of four pieces, the formation is executed in the same manner, and by the same commands.

To Advance in Line.

80. The battery being in line at a halt, to cause it to advance, the captain indicates to the guide the points on which he is to march, and commands:

1. *Battery—forward.*
2. MARCH.
3. *Guide right (or left).*

The commands, *Forward—MARCH—Guide right (or left)*, are repeated by the chiefs of sections. At the command MARCH, all the carriages move forward; the chiefs preserving the intervals and alignments.

To Halt the Battery and Align it.

81. When the battery is marching in line, to halt and align it, the captain commands:

1. *Battery—HALT*
2. *Right (or left)—DRESS.*
3. FRONT.

The commands, *HALT—Right (or left)—DRESS*, are repeated by the chiefs of sections.

The captain superintends the alignment; placing himself for that purpose on the flank of the guide. When the battery is aligned the captain commands: FRONT.

To March by a Flank.

82. The battery being in line, in march or at a halt, to cause it to move in the direction of one of its flanks, the captain commands:

1. *Battery—By the right (or left) flank.*
2. MARCH.

And the movement is executed as prescribed in No. 61.

Oblique March.

83. The captain commands:

Battery—right or left oblique, &c., and the movements are executed as prescribed in No. 62.

About in Line.

84. Executed as prescribed in No. 63, substituting the word, *battery*, for *column*.

To change Direction in Line.

85. The battery being in line at a halt, to wheel it to the right, the captain commands:

1. *Battery—Right wheel.*
2. MARCH.
3. FORWARD.
4. *Battery—HALT.*
5. *Right—DRESS.*
6. FRONT.

The commands, *Right wheel—MARCH—FORWARD—HALT—Right—DRESS*, are repeated by the chiefs of sections.

At the command, MARCH, the pivot carriage moves at a walk. The others quicken the pace as may be necessary, and preserve their intervals from the pivot.

At the command, FORWARD, which is given when the pivot carriage has entered the new direction, that carriage moves direct to the front. When it has advanced one yard, the captain commands: *Battery—HALT—Right—*

DRESS. The commands, FORWARD—HALT—*Right—DRESS*, are repeated by the chief of the right section immediately after the captain, and by the other chiefs in time to be applicable to their sections; the pivot carriage halting at the command HALT, and the others halting and dressing toward the pivot as they arrive in succession on the line.

When the battery is aligned the captain commands: **FRONT.**

The battery is wheeled to the left according to the same principles and by inverse means.

When the battery is at a halt, or marching in line, to wheel it to the right and continue the march, the captain commands:

1. *Battery—Right wheel.*
2. **MARCH.**
3. **FORWARD.**

The movement is executed as already described, except that the pivot carriage, after wheeling, continues to march in the new direction.

To Close Intervals in Line.

86. When the battery is marching in line, to diminish its intervals, the captain commands:

1. *On right (or left) piece, of — section
to — yards—close intervals.*
2. **MARCH.**

The chief of the section designated repeats the commands, *On right (or left) piece,—to — yards—close intervals*; and the other chiefs of sections command: *Right (or left) to — yards—close intervals.* At the

command, **MARCH**, repeated by the same chiefs, the piece designated as the one of direction moves forward, and the others oblique toward it. The command for the guide is then renewed by the captain, and repeated by the chiefs of sections.

When the intervals are to be closed toward one of the flanks, the captain commands: *On right (or left) piece, to — yards—close intervals—MARCH.*

To Resume Intervals.

87. When the battery is marching in line, with diminished intervals, to cause the regular intervals to be resumed, the captain commands:

1. *On right (or left) piece, of — section
— full intervals.*
2. **MARCH.**

The chief of the section designated repeats the command, *On right (or left) piece—full intervals*, and the other chiefs of sections command: *from the right (or left)—full intervals.*

At the command, **MARCH**, repeated by the chiefs of sections, the carriage of direction marches direct to the front, and the others oblique to the right and left.

As soon as the movement is completed the command for the guide is renewed by the captain, and repeated by the chiefs of sections.

When the intervals are to be resumed from one of the flanks, the captain commands:

1. *On right (or left) piece — full intervals.*
2. **MARCH.**

Passage of Obstacles.

88. When the battery is marching in line, to pass an obstacle which presents itself in front of one of the sections, the captain commands:

1. — *Section.*
2. OBSTACLE.

At the command, OBSTACLE, the chief of the section designated gives the necessary commands for closing on one of the adjoining sections, removing from it, breaking his section, or halting it and forming in column in rear of one of the adjoining sections. The section generally resumes the regular march by means the inverse of those used for passing the obstacle. It resumes its place at an increased gait, and by the commands, *Section into line*—MARCH, from its chief.

FORMATIONS IN BATTERY.

In Line, to Form in Battery to the Front.

89. When the battery is in line at a halt, to form in battery to the front, the captain commands:

In Battery—ACTION FRONT.

At this command, repeated by the chiefs of sections, the pieces are wheeled about, and the crews go to their stations for action.

In Line, to Form in Battery to the Rear.

90. When the battery is in line at a halt, to form in battery to the rear, the captain commands :

1. *Fire to the rear.*
2. **IN BATTERY.**

At the command, **IN BATTERY**, repeated by the chiefs of sections, the crews go to their stations for action.

In Battery, to Form in Line to the Front.

91. Being in battery to the front, to form in line to the front, the captain commands :

1. *Secure the howitzers.*
2. *Pieces—left about.*
3. **MARCH.**
4. **HALT.**
5. *Right—DRESS.*
6. **FRONT.**

If in battery to the rear, the captain commands :

1. *Secure the howitzers.*
2. *Right—DRESS.*
3. **FRONT.**

In Battery, to Form in Line to the Rear.

92. Being in battery to the front, to form in line to the rear, the captain commands :

1. *Secure the howitzers.*
2. *Right—DRESS.*
3. **FRONT.**

If in battery to the rear, the captain commands:

1. *Secure the howitzers.*
2. *Pieces—left about.*
3. MARCH.
4. HALT.
5. *Right—DRESS.*
6. FRONT.

In Column, to Form in Battery to the Front.

93. When the battery is in column at a halt, to form in battery to the front, by gaining ground to the left, the captain commands:

1. *Forward into battery—left oblique.*
2. MARCH.
3. *Guide right.*

Executed as prescribed in No. 66. As each section arrives upon the line, its chief forms it in battery by the command, ACTION FRONT.

The formation, to gain ground to the right, is executed according to the same principles and by inverse means.

In Column, to Form in Battery to the Rear.

94. When the battery is in column at a halt, to form in battery to the rear by gaining ground to the left, the captain commands:

1. *Into battery face to the rear—left oblique.*
2. MARCH.
3. *Guide right.*

Executed as the preceding, except that the chiefs of sections command, **IN BATTERY**, as their sections arrive upon the line.

In Column, to Form in Battery to the Right or Left.

95. When the battery is in column, in march or at a halt, if the captain wishes to form it in battery to the left, by gaining ground to the right, he commands:

1. *Fire to the left—by section right wheel.*
2. **MARCH.**
3. **IN BATTERY.**

(*Pl. 15.*) At the first command, the chiefs of sections command: *Section—right wheel*, and at the second, which they repeat, all the sections wheel to the right as prescribed in No. 68.

At the command, **IN BATTERY**, all the sections form at once in battery to the rear as prescribed in No. 90.

When the captain wishes to form in battery to the left, by gaining ground to the left, he commands:

1. *Fire to the left—by section left wheel.*
2. **MARCH.**
3. **ACTION FRONT.**

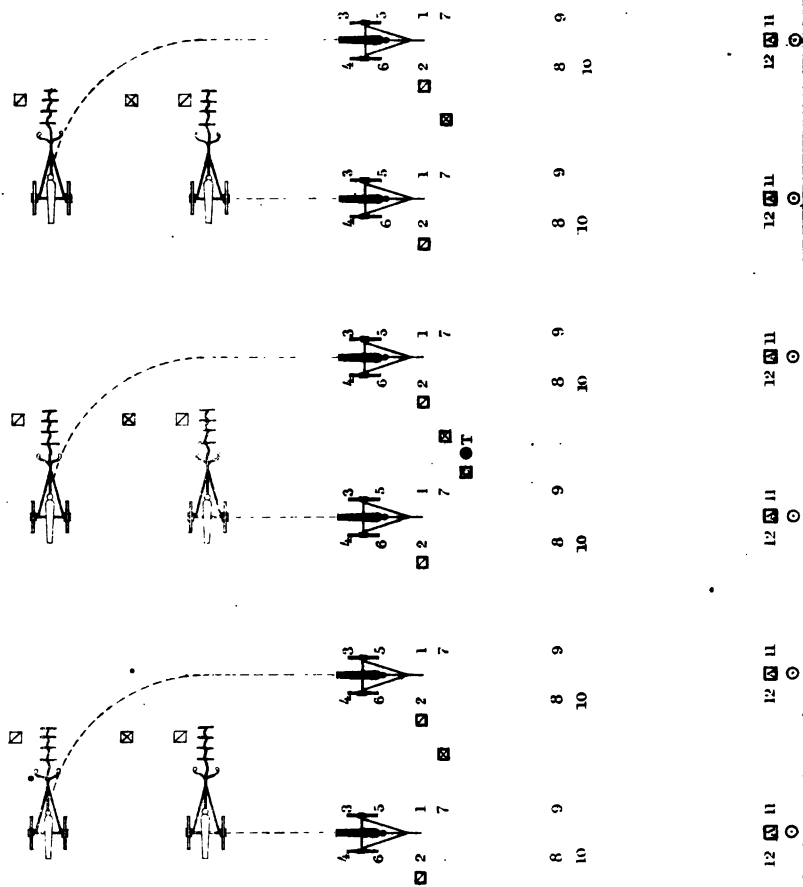
At the first command, the chiefs of sections command: *Section—left wheel*; and at the second, which they repeat, all the sections wheel at once to the left.

At the command, **ACTION FRONT**, all the sections form at once into battery to the front.

The two formations in battery to the right, by gaining ground to the left or right, are executed according to the same principles and by inverse means. The commands are: *Fire to the right—by section left wheel—*

1 "Fire to the left ... by Section right wheel."
 2 "March."

TO K



MARCH—IN BATTERY. Or, *Fire to the right—by section right wheel—MARCH—ACTION FRONT.*

In Column, to Form in Battery on the Right or Left.

96. When the battery is marching in column, to form in battery on the right, the captain commands:

1. *On the right into battery.*
2. **MARCH.**
3. *Guide right.*

(*Pl. 16.*) At the first command, the chief of the leading section commands: *Section—right wheel.* At the command, **MARCH**, repeated by him, the leading section wheels to the right, and its chief conducts it to the line by the commands, **FORWARD—Guide right**, as prescribed in No. 69. And then it is formed into battery to the front as prescribed in No. 89, by the commands, **IN BATTERY—ACTION FRONT**, from its chief.

The other sections continue to advance, and as each arrives opposite its place in battery, it is formed into battery by its chief as was the leading section.

The formation in battery on the left, is executed according to the same principles and by inverse means.

When the battery is in column at a halt, it is formed in battery on the right or left according to the same principles.

In this case the chiefs of the two rear sections command: *Section—forward*, immediately after the first command of the captain, and then repeat the commands, **MARCH—Guide right (or left).**

To Deploy the Double Column into Battery, to the Front or Rear.

97. The battery being in double column at a halt, to deploy it into battery to the front, the captain commands:

1. *Forward into Battery.*
2. MARCH.

Executed as in No. 78, except that the pieces are brought into battery by the command, ACTION FRONT, from their chiefs.

If the captain wishes to form in battery to the rear, he commands:

1. *Into battery faced to the rear.*
2. MARCH.

To Deploy the Double Column into Battery, to the Right or Left.

98. When the battery is in double column, marching or at a halt, to form it in battery to the right, the captain commands:

1. *To and on the right into battery.*
2. MARCH.

Executed as in No. 79, except that the pieces are brought into battery by the commands, IN BATTERY—ACTION FRONT, from their chiefs.

To Pass from the Order in Battery to the Order in Column.

99. Being in battery, to form column, the captain

first causes the line to be formed as prescribed in Nos. 91 or 92; and then forms column by one of the manoeuvres for passing from the order in line to the order in column.

To March by a Flank.

100. Being in battery, to gain ground to the left, for the purpose of forming again in battery without an intermediate formation, the captain commands:

1. *Secure the howitzers.*
2. *Pieces—right wheel.*
3. MARCH.
4. FORWARD.

These commands are repeated by the chiefs of sections. At the command, MARCH, the pieces wheel as ordered and move forward with an interval of about one yard.

The movement to gain ground to the right is executed according to the same principles and by inverse means.

As soon as the battery has reached the position which it is intended to occupy, the captain commands:

1. *Battery—by the left flank.*
2. MARCH.
3. IN BATTERY.

The commands, *By the left flank—MARCH*, are repeated by the chiefs of sections, and executed as usual. The command, IN BATTERY, is given and repeated as soon as the pieces have completed the wheel, and is executed as prescribed in No. 90.

The same thing may be executed by gaining ground to the left or right flanks, halting, and commanding

ACTION RIGHT, or, **ACTION LEFT**, which will be executed as prescribed in the School of the Piece.

In all cases when a battery is halted or marching in a flank direction it may be formed into battery to the left or right, by the command **ACTION LEFT**, or, **ACTION RIGHT**.

Firings.

101. When every thing is prepared for firing, the captain commands:

COMMENCE FIRING.

This command, given by itself or after **LOAD**, is repeated by the chiefs of sections, and the firing immediately commenced.

The firing is discontinued by the command or signal **CEASE FIRING**, which is repeated by the chiefs of sections and pieces.

When the battery is formed for action, the pieces are not loaded until the command **LOAD**, or **COMMENCE FIRING**, is given by the captain. In successive formations, when this command is given, it is repeated in succession by the chiefs of sections as their sections are formed on the line.

At the command **CEASE FIRING**, such pieces as are loaded must be discharged, except in the case mentioned in the School of the Piece, when the battery retires by hand. In no case should a piece be secured for the march without discharging it, or withdrawing the charge.

To Fire Advancing.

102. When the battery is firing, to advance by half batteries, the captain commands:

1. *Fire advancing—by half battery.*
2. *Right half battery—ADVANCE.*

At the second command, the chief of the right half battery discontinues firing, and commands: *Secure the howitzers—Pieces left about—MARCH—FORWARD—Guide left.*

As soon as the right half battery reaches the new position, previously indicated by the captain, its chief places it in battery by the commands: **HALT—ACTION FRONT**, and the firing is renewed by command from the chief of half battery.

The fire of the left half battery is continued during the movement of the right, care being taken to direct the pieces so that their fire shall not injure the half battery in advance.

As soon as the right half battery commences firing, the left moves forward with the guide to the right; and after passing the right half battery as far as the latter has advanced, is formed into battery and the firing commenced.

The movements of the left half battery are effected by commands and means corresponding to those of the right.

The right half battery again advances as soon as the left commences firing, and the two continue to advance alternately until the captain causes the firing to cease. The battery is then aligned, or formed into line to the front or rear by the proper commands from the captain.

While advancing by half battery, the captain places himself habitually with the most advanced portion of the battery, and is accompanied by the chief of the centre section.

To fire advancing by half battery, commencing with the left, is executed according to the same principles, and by inverse means.

The movement may also be executed by sections; the sections advancing in succession according to their positions in the battery.

To Fire in Retreat.

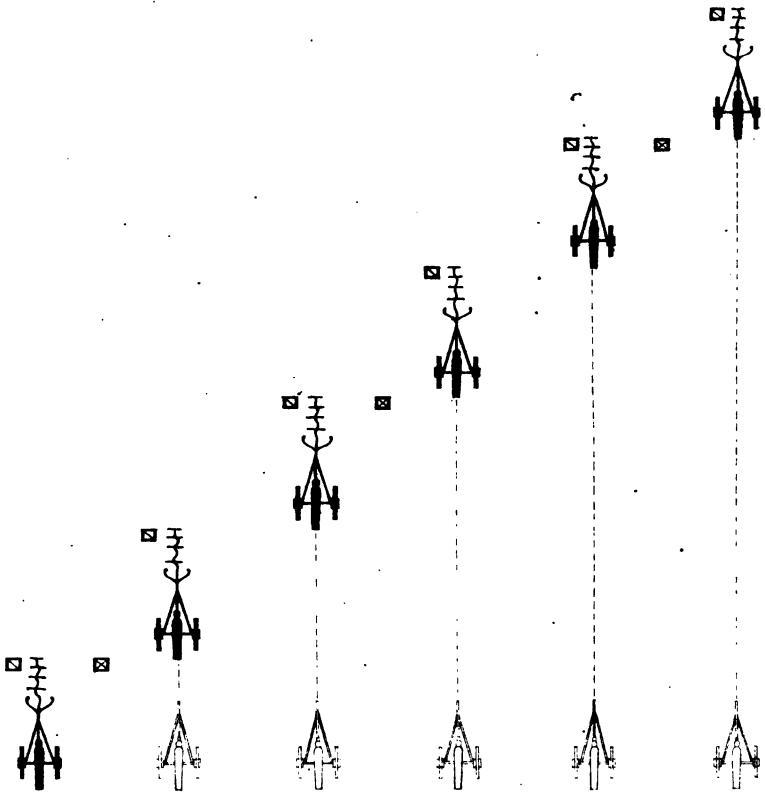
103. When the battery is firing, to retire by half batteries, the captain commands:

1. *Fire retiring—By half battery.*
2. *Right half battery—RETIRE.*

At the second command, the chief of the right half battery discontinues firing, and commands: *Secure the howitzers—FORWARD—Guide right*; and conducts the half battery to the ground previously indicated by the captain. As soon as the ground has been reached, the chief of half battery commands: **HALT—IN BATTERY**, and commences firing; taking care not to injure the other half battery.

As soon as the right half battery commences firing, the left retires with the guide to the left, and, after passing the right half battery as far as the latter has retired, it is formed into battery and the firing again commenced. The movements are executed in a manner corresponding to those of the other half battery.

1. "By piece from the right — Front into Echelon."
2. "March."



The half batteries continue to retire alternately until the captain causes the firing to cease. The battery is afterward aligned, or formed into line to the front or rear, by appropriate commands from the captain.

While retiring by half battery, the captain remains habitually with the portion of the battery nearest the enemy, and is accompanied by the chief of the centre section.

To fire retiring by half battery commencing with the left, is executed according to the same principles, and by inverse means.

The movement may also be executed by sections; the sections retiring in succession according to their positions in the battery.

Movements for Firing in Echelon.

104. When the battery is in line at a halt, to advance in echelon of pieces, the captain commands :

1. *By piece from the right—Front into echelon.*
2. MARCH.

(Pl. 17.) At the second command, the right piece moves forward. The next piece moves forward in like manner, as soon as its leaders at the drag-rope are passed by the wheels of the carriage on the right; and the other pieces commence the movement in succession according to the same rule.

The officers preserve the same relative positions as in line.

When the battery is marching in line, the echelon is formed according to the same principles, and by the same

commands; the gait being regulated as in breaking sections.

The battery advances in echelon of pieces from the left, according to the same principles and by inverse means.

When the battery is in echelon, marching or at a halt, it may be formed into battery to the front or rear, as explained in Nos. 89 and 90.

When firing in echelon to the front or rear, the direction of the fire may be changed to the right or left. For this purpose the captain orders the firing to cease, and commands: **ACTION RIGHT (OR LEFT)**.

If the pieces be in battery, at the command *Front into echelon*, the pieces need not be secured, but moved forward "by hand," and the fire reopened as each piece arrives in its position.

A retreating battery could perform the same movement at the command, *By piece from the right (or left)—Retreat into echelon—MARCH*. Whether retreating or advancing, the line will be re-formed by the command, *Right—DRESS*.

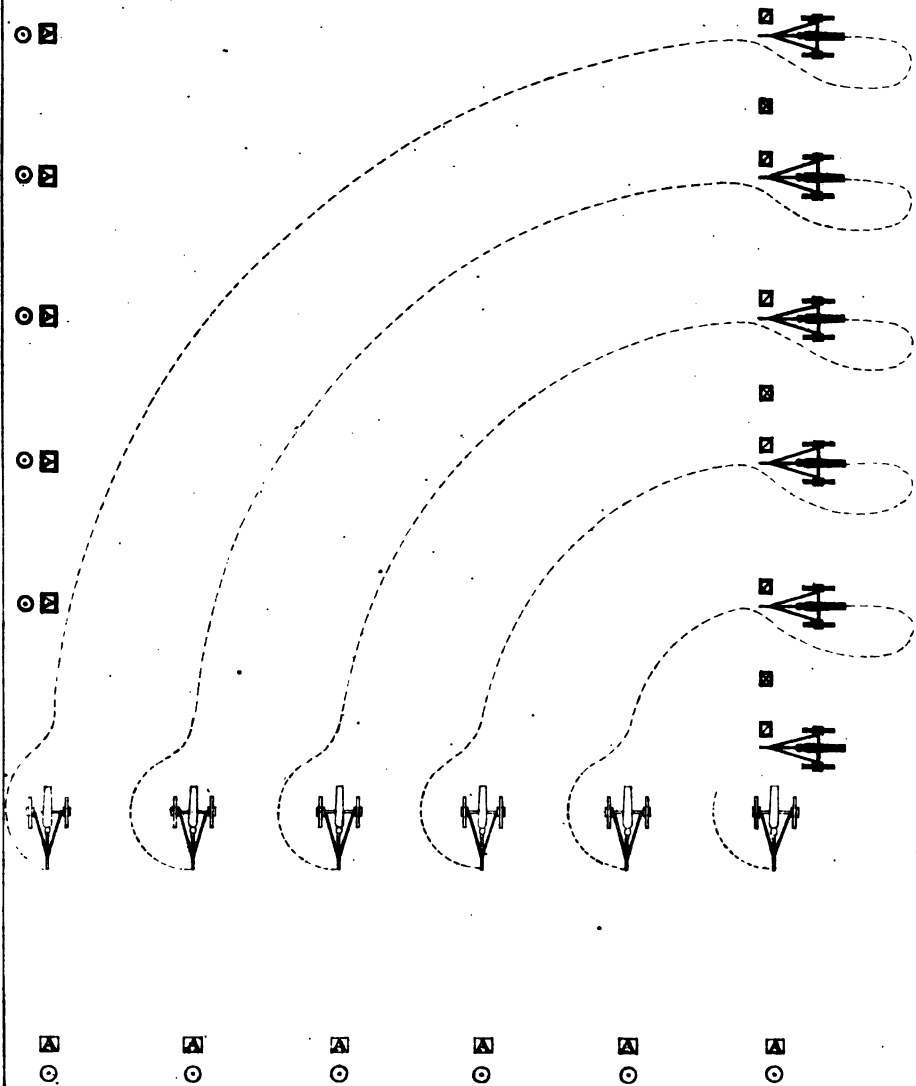
To Fire to the Rear.

105. When the battery is firing, to fire to the rear, the captain causes the firing to cease, and commands:

1. *Fire to the rear.*
2. **MARCH.**
3. **IN BATTERY.**

These commands are repeated by the chiefs of sections. At the command, **MARCH**, the pieces are wheeled to the left about.

1. "Fire to the right"
2. "Change front forward on the right Piece."
3. "March"



The cautionary command, *Pieces—left about*, may be given by the chiefs of sections after the first command of the captain.

CHANGES OF FRONT IN BATTERY.

Change of Front to Fire to the Right, Left Wing Forward, and the Reverse.

106. When the battery is firing, if the captain wishes to make a perpendicular change of front to fire to the right, throwing forward the left wing, he discontinues firing, and commands :

1. *Fire to right.*
2. *Change front forward on the right piece.*
3. MARCH.

(*Pl. 18.*) At the second command, the chief of the right section places the right piece in the new direction. He also causes the left piece of his section to be moved forward by hand, and established on the new line. The other chiefs of sections command: *Secure the howitzers—Pieces—left about.* At the command, MARCH, repeated by these chiefs, the centre and left sections wheel to the left about and move to the front; and when each has arrived opposite its place on the new line, its chief commands: *Section—right wheel—MARCH—FORWARD*, and afterward: *In battery—ACTION FRONT*, so as to form upon the alignment of the right piece.

The pivot piece commences firing as soon as it is in position, and the others as they arrive on the line.

The change of front to fire to the left, right wing forward, is executed according to the same principles, and by inverse means.

Change of Front to Fire to the Left, Left Wing Forward, and the Reverse.

107. When the battery is firing, if the captain wishes to make a perpendicular change of front to fire to the left, throwing forward the left wing, he discontinues firing, and commands:

1. *Fire to the left.*
2. *Change front forward on the right piece.*
3. MARCH.

Executed as prescribed in No. 106; except that upon arriving upon the new line, the chiefs of the centre and left sections command: *Fire to the rear*—IN BATTERY.

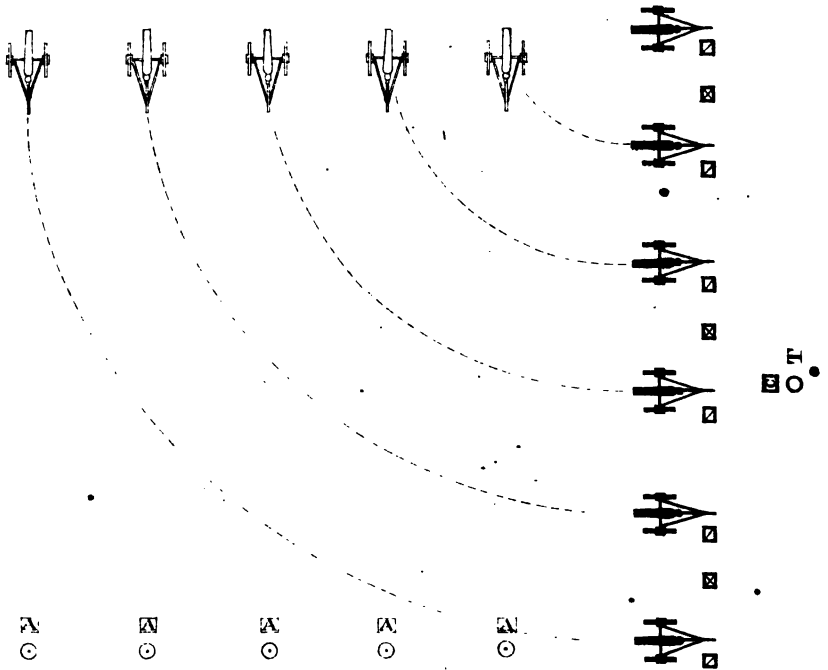
Change of Front to Fire to the Left, Left Wing to the Rear, and the Reverse.

108. When the battery is firing, if the captain wishes to make a perpendicular change of front to fire to the left, throwing the left wing to the rear, he causes the firing to cease and commands:

1. *Fire to the left.*
2. *Change front to the rear on the right piece.*
3. MARCH.

(Pl. 19.) At the second command, the chief of the right section places the right piece in the new direction. He also causes the left piece of his section to be moved

1. "Fire to the left."
2. "Change front to the rear on the right piece."
3. "March."



to the rear by hand, and established on the new line. The other chiefs of sections command: *Secure the howitzers.* At the command, MARCH, repeated by these chiefs, they command, FORWARD—*Guide left*; and afterward in succession, *Section—left wheel*—MARCH—FORWARD—IN BATTERY. The pieces dress toward the pivot as they arrive on the line.

The pivot piece recommences firing as soon as it is unmasked; and the others when they arrive on the line.

The change of front to fire to the right, right wing to the rear, is executed according to the same principles, and by inverse means.

Change of Front to Fire to the Right, Left Wing, to the Rear, and the Reverse.

109. When the battery is firing, if the captain wishes to make a perpendicular change of front to fire to the right, throwing the left wing to the rear, he discontinues firing, and commands:

1. *Fire to the right.*
2. *Change front to the rear on the right piece.*
3. MARCH.

Executed as prescribed in No. 108, except that upon arriving upon the new line, the chiefs of the centre and left sections command: *In battery*—ACTION FRONT.

In changes of front or other movements in battery, the ammunition boxes may be carried by hand, at the discretion of the captain.

To Fire to the Front, Right, and Left.

110. When the battery is firing, if the captain wishes to fire to the right and left, without altogether discontinuing the fire to the front, he gives the commands:

1. *Fire to the front, right, and left.*
2. *Right and left sections front into echelon.*
3. MARCH.

(Pl. 20.) At these commands, the chief of the right section throws his piece forward by the rules already prescribed, and opens fire to the right. In like manner, the left section opens fire to the left. The centre section moves forward until it has uncovered the others, and forms action front. Should the nature of the ground or circumstances preclude an advance movement, the manœuvre can be accomplished by a retrograde, the captain giving the commands:

1. *Fire to the front, right, and left.*
2. *Right and left sections—to the rear into echelon.*
3. MARCH.

In this case the centre section retains its position.

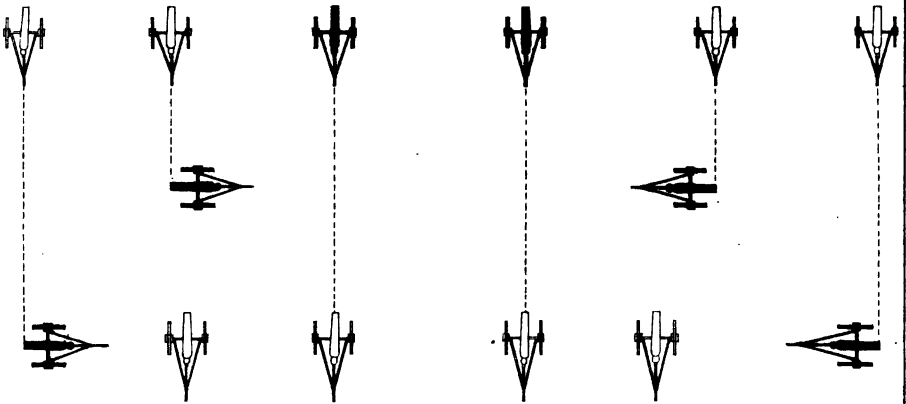
To Pass a Defile in Front.

111. When the battery is firing, to pass a defile in front of the right section, the captain commands:

1. *To the front—by the right section—pass the defile.*
2. MARCH.

At the first command, the chief of the right section discontinues firing, secures the howitzers, and commands: *Pieces—left about.* At the command, MARCH,

"To fire to the front, right and left."



repeated by this chief, who also commands: **FORWARD—***Guide left*, the section moves forward, passes the defile, and is again established in battery and the firing commenced by his command.

As soon as the right section commences firing, the centre is put in motion in like manner. Its chief conducts it through the defile by successive wheels, and forms it into battery in line with the first.

As soon as the centre section commences firing, the left passes in like manner.

When the defile is in front of the left section, it is passed according to the same principle, commencing with that section.

When the defile is in front of the centre section, it is passed according to the same principles, commencing with that section, and by the commands: *To the front—by the centre section—pass the defile—***MARCH.** Unless there is some reason to the contrary, the right section will pass before the left.

When the flank or oblique march is better suited to the nature of the ground, the chiefs of sections will give the required commands.

When the defile will admit of but one piece at a time, the sections are broken by their chiefs in such a manner as to cause the nearest piece to enter first. The sections are re-formed by their chiefs immediately after passing the defile.

To Pass a Defile in Rear.

112. When the battery is firing, to pass a defile in rear of the centre section, the captain commands:

1. *To the rear—by the right section—pass the defile.*

2. **MARCH.**

The right section passes the defile by orders from its chief, and is followed by the left and centre sections in succession.

When the defile is in rear of one of the flanks, the movement should commence with the other.

To Rest.

113. When the captain wishes the men to stand at ease, but to remain at their stations at the drag-rope, he commands: **REST**, or *In place—REST*.

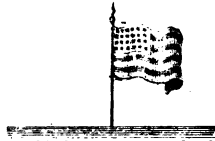
If he wishes to allow the men to leave the drag-rope, to lie upon the ground, or to sit upon the piece, he commands: *At will—REST*. In both cases the crews will resume their stations at the command, **ATTENTION**.

When the crews are to be allowed to leave their guns, but not the parade ground, the captain will order them to the rear, face them to a flank, and command: *Break ranks—MARCH*. They will resume their stations at the drag-rope at the command, **FALL IN**; or at the call of the bugle.

Parade for Review and Inspection.

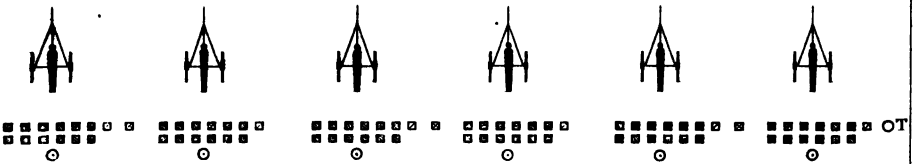
114. The battery being in line, with the trumpeters on the right, the captain commands:

"Parade for Review and Inspection."



Camp Colors.

6



1. *Attention.*
2. *Prepare for review.*
3. *Crews to the rear.*
4. MARCH.
5. *Right—DRESS.*
6. FRONT.

(Pl. 21.) At the third command, repeated by the chiefs of sections, the crews drop the drag-ropes and face about. Nos. 1 and 2 placing themselves in front of Nos. 3 and 4. At the command, MARCH, they file to their stations as prescribed in No. 4. At the fifth command, the crews are aligned. The chiefs of sections take post half-way between their crews. The trumpeters fall back on the same line.

The captain then commands:

Draw—SWORDS,

and takes post as in line.

In this order the battery awaits the approach of the reviewing officer. When he is midway between the camp color and the captain, the latter faces about and commands:

Present—SWORDS.

He immediately resumes his proper front and salutes.

The music plays according to the rank of the reviewing officer.

The reviewing officer having halted and acknowledged the salute, the captain brings his sword to a carry, faces about to the line, as before, and commands:

Carry—SWORDS.

He immediately faces about. The reviewing officer turns off to the right of the battery, passes along its front, and returns to the right by passing between the

pieces and crews, or in rear of the crews. While the reviewing officer is passing around the battery, the music plays, and ceases when he turns off to take his post at the camp color.

When the music ceases, the captain faces about, and commands :

1. *Return*—SWORDS.
2. *Secure the howitzers.*

The reviewing officer having taken a position near the camp color, the captain commands :

1. *By section—Right wheel.*
2. MARCH.
3. *Pass in Review.*
4. *Column forward—Guide right.*
5. MARCH ;

and places himself at the head of the column, four yards in advance of the chief of the leading section.

The trumpeters march four yards in advance of the captain

The music will begin to play at the command, MARCH, and after passing the reviewing officer, wheel to the left out of the column, and take a position opposite and facing him, and will continue to play until the rear of the column shall have passed him, when it will cease, and follow in the rear of the column ; unless the battery is to pass in *quick time* also, in which case it will keep its position.

All the officers salute in succession as they arrive within six paces of the reviewing officer ; casting their eyes toward him at the same time, and bringing their swords to a carry after having passed him six paces. As soon as the captain has saluted, he places himself near the

reviewing officer, remains until the rear has passed, and then rejoins the battery.

The column is so conducted as to march parallel to the line on which the battery is to form, and far enough in its rear to enable the column to wheel into line. It is then wheeled into line, the crews ordered to the rear, and the review terminated by a salute as at the beginning.

If, however, instructions have been given to march past in *quick* time also, the captain will, instead of wheeling into line, give the command :

1. *Quick time.*
2. MARCH.

In passing the reviewing officer again, no salute will be offered by either officers or men. The music will have kept its position opposite the reviewing officer, and at the last command will commence playing, and as the column approaches will place itself in front of, and march off with the column, and continue to play until the battery is halted on its original ground of formation. The review will terminate in the same manner as prescribed above.

When a battery is to march past in line, or in column of half batteries, it will be done according to the principles already described. In line, the officers will be at their usual posts. In column of half batteries, the captain will be two yards in advance of the chief of the leading half battery; each chief of half battery two yards in front of the centre of his command, the chief of the centre section on the left of the leading half battery, four yards from the leaders at the drag-rope.

In all cases, the trumpeters are four yards in front of the captain.

When the battery is to be minutely inspected, the captain will cause the ranks of the crews to be opened, if required, by the commands :

1. *To the Rear open order*
2. MARCH.

Which will be executed as in infantry.

Note.—The crews may be formed “in front;” having the muzzles of the pieces turned toward the inspecting or reviewing officer, if preferred.

In cases where the battery is reviewed with other troops, the wheels of the pieces should be on a line with the front rank, and the crews should be drawn up on the “right” or “left.”

Officers' Salute with the Sabre.

115. When officers are to salute, whether on horse-back, or on foot, at a halt or in march, they execute it in four motions.

1st. At six yards from the person to be saluted, raise the sabre perpendicularly, the point upward, edge to the left, the hand opposite to and one foot from the right shoulder, the wrist six inches from the body.

2d. Lower the blade, extending the arm to its full length, the hand *in quarte*, until the point of the sabre is near the foot.

3d. Raise the sabre quickly, the point upward as in the first motion, after the person saluted is passed four yards.

4th. Bring the sabre to a carry.

To Leave the Battery.

116. When the howitzers are to be embarked, the captain will direct each chief of piece to embark separately; or he may command, *At will*—EMBARK. This will be considered as the end of the exercise; each howitzer returning to its own ship.

When the howitzers are to be left on the ground, the captain will give the necessary instructions in regard to the disposition of the ammunition boxes, drag-ropes, &c., and will break ranks as prescribed in No. 113.

SUPPLEMENTARY REMARKS.

Marches.

The front of a column should not be frequently diminished and increased on a long march, as it unavoidably increases the fatigue of the column, particularly the rear of it; when, therefore, the front is diminished, it should not be increased until there is a probability that it will not be necessary to diminish it again for some time.

The officers commanding sections, in order to preserve them in place, will, without waiting for express instructions, give such orders as may be necessary for holding back in descents, for the passage of obstacles, &c.

An intelligent petty officer should be sent to reconnoitre the road or ground that artillery is to pass over, and, when necessary, to report the state of it. When the march is connected with military operations, an officer should be employed for this duty.

Officers commanding sections should frequently halt, and see that their carriages are well up, and marching in proper order. The strictest attention should be paid to the preservation of distances; not opening out more than is absolutely necessary.

When an accident happens to a carriage, it should, if possible, be drawn out of the column, so as not to interrupt the march of the other carriages or troops. The carriages in its rear must pass it by the most convenient flank, and close to proper distance. The disabled carriage resumes its position as soon as the damage is repaired; when the road is narrow, it must fall into the first interval it finds, and use every opportunity afforded by a wider space to regain its proper place.

When it is necessary to move a carriage along a slope, where a small jerk may overturn it, a drag-rope should be fastened to the lowest side of the carriage, passed over the top of it, and held by two or three men, marching on the upper side of the slope; a small effort by these means will prevent a carriage from overturning on a very steep slope.

THE END.

BUGLE SIGNALS.

1. March for Review.

Musical notation for '1. March for Review.' consisting of six staves of music in common time (C). The melody is written in a single treble clef. The first staff begins with a quarter rest followed by a series of eighth and sixteenth notes. The second staff continues the melody with similar rhythmic patterns. The third staff includes a repeat sign (double bar line with dots) and continues the melody. The fourth staff features a more complex rhythmic pattern with sixteenth notes. The fifth staff continues the melody with a repeat sign. The sixth staff concludes the piece with a final cadence, including a double bar line and repeat dots.

2. March in Common Time.

Musical notation for '2. March in Common Time.' consisting of a single staff of music in common time (C). The melody is written in a single treble clef. It begins with a quarter rest followed by a series of quarter notes. The piece concludes with a double bar line and repeat dots.

3. March in Quick Time.

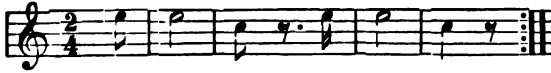
Musical notation for '3. March in Quick Time.' consisting of a single staff of music in 2/4 time. The melody is written in a single treble clef. It begins with a quarter rest followed by a series of eighth notes. The piece concludes with a double bar line and repeat dots.

4. March in Double Quick.

Musical notation for '4. March in Double Quick.' consisting of a single staff of music in 2/4 time. The melody is written in a single treble clef. It begins with a quarter rest followed by a series of eighth notes. The piece concludes with a double bar line and repeat dots.

BUGLE SIGNALS

5. Halt.

Moderato.

6. Forward.

Allegro.

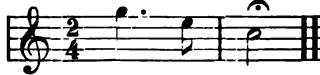
7. Head of Column to the Right.



8. Head of Column to the Left.



9. Right Oblique.

Moderato.

10. Left Oblique.

Allegro.

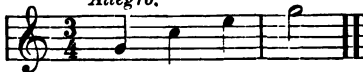
11. About.



12. Countermarch.



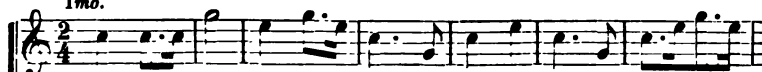
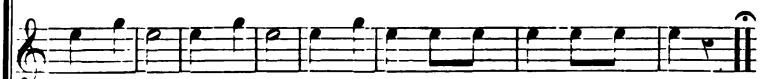
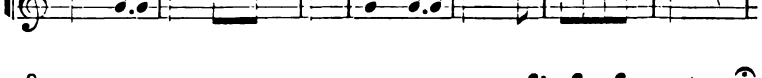
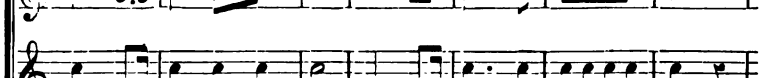
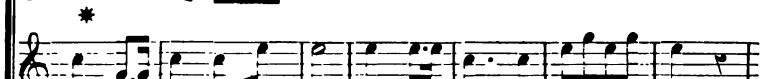
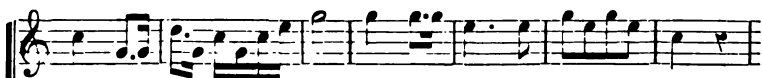
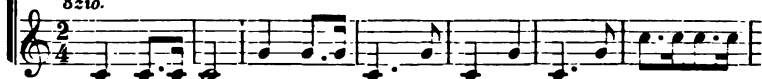
13. Man the Drag-Ropes.

Allegro.

19. Assembly.

Allegretto Moderato.

20. Retreat.

1^{mo}.*As a Signal play to the mark **2^{do}.8^{zio}.

D. Van Nostrand's Publications.

Scott's Military Dictionary.

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