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THE BEQUEST OF  
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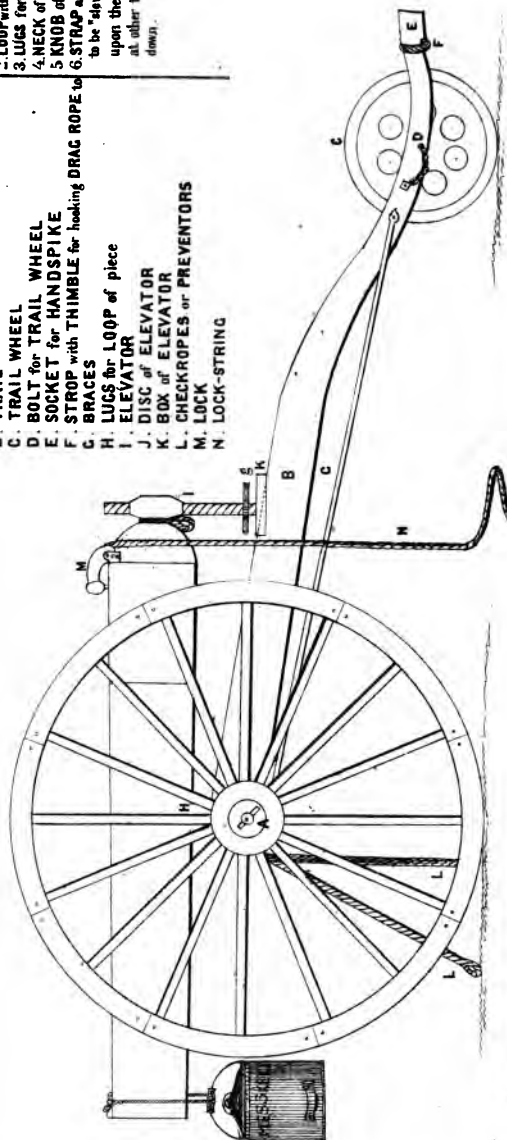




NAVAL HOWITZER ASHORE.

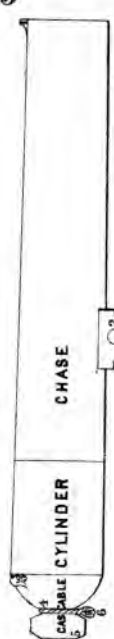
1. MUZZLE-SIGHT
2. LOOP with HOLE for BOLT
3. LUGS for LOCK
4. NECK of CASCABE
5. KNOB of CASCABE
6. STRAP around the neck of ascabe to be "sawed" thimble up by No. 6 upon the order "prepare to dismount" at other times the thimble is to be down.

- A. AXLE
- B. TRAIL WHEEL
- C. TRAIL WHEEL
- D. BOLT for TRAIL WHEEL
- E. SOCKET for HANDSPIKE
- F. STROP with THIMBLE for hooking DRAG ROPE to
- G. BRACES
- H. LUGS for LOOP of piece
- I. ELEVATOR
- J. DISC of ELEVATOR
- K. BOX of ELEVATOR
- L. CHECKROPEs or PREVENTORS
- M. LOCK
- N. LOCK-STRING



HANDSPIKE.

This has an iron hook, iron strapped around the middle of it for hooking into the thimble of strap around the neck of cascabe, thus fitted it has been found a great convenience in dismounting as it dispenses with the use of the "shifting bar" and "slew bolt", it should be made of stout wood, 6 feet 6 inches long and 2 1/2 inches in diameter; the part which enters the socket of trail (6 inches in length) being tapered to 2 inches.



DRAG-ROPE.

a. Hooks of Drag rope 18  
 c. Lugs of Drag rope 18  
 5 feet apart and maintained by Nos. 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

17 18  
 15 16  
 13 14  
 11 12



THE

# NAVAL HOWITZER

ASHORE.

*(From folding plates)*

BY

FOXHALL A. PARKER,

Commander United States Navy.



NEW-YORK:

D. VAN NOSTRAND, No. 192 BROADWAY.

1865.

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TO  
REAR-ADMIRAL JOHN A. DAHLGREN,  
TO WHOSE INVENTIVE GENIUS  
THE NAVY IS INDEBTED FOR THE HOWITZER OF WHICH I TREAT,  
*This Volume*  
IS INSCRIBED.

THE BUREAU OF ORDNANCE approves the opinion of the Board appointed to examine the manuscript submitted by Commander FOXHALL A. PARKER, U.S.N., in relation to the exercise of Naval Howitzers on shore, and recommends that the work be introduced, for study and practice, in the Navy of the United States, especially as it coincides, with the addition of a few elaborations, precisely with the Ordnance Instructions, which are the standard guide for the Naval service.

10th November, 1864.

H. A. WISE,  
Chief of Bureau.

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To my young friend, Acting Ensign FRANCIS S. EASTMAN, I am indebted for the very exact and spirited illustrations which adorn this work.

FOXHALL A. PARKER.





# THE NAVAL HOWITZER ASHORE.

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## EXERCISE OF THE PIECE.

THIS exercise is designed for the instruction of the seaman in his duties at the howitzer in action and on the march, in which he should be thoroughly versed before the drill-officer attempts to combine the pieces either in section or in battery.

A. For each howitzer an officer and twenty-one men are required, whose stations at the gun, when "cleared for action," are as follows:

Nos. 3 and 4 are abreast and just clear of the muzzle, on the right and left of it respectively; No. 5 is just outside of the right wheel, abreast of the axle; No. 6 occupies a similar position on the opposite side of the carriage; Nos. 7 and 8 are abreast of the hinder part of the wheels; Nos. 9 and 10 abreast of extremity of trail-handspike.

The space between 7 and 9 on the one side, and 8 and 10 on the other, is *eleven feet*, which must serve as a standard of distance for the higher numbers up to 20 inclusive.

The first and second captains (1 and 2) are at the breech, just in rear of the cascabel, and dress on 3 and 4; 5 and 6 serving as guides by which to dress all the other men, the quarter-gunner excepted, who stands faced to the front, one foot in rear of the ammunition-boxes, which are placed about two yards distant from 19 and 20, and dressed on the first and second captains.

The drag-rope is coiled down between the boxes, with the hook out. The right file makes a half-face to the left, the left file a half-face to the right. The officer takes post a little outside of the right file, and abreast of the trail-wheel, and makes a half-face to the left.

#### NOTES TO STATIONS.

These were prepared for the medium twelve-pounder; when the light one of four hundred and thirty pounds is used, fourteen men are sufficient, the higher numbers being omitted.

Two supernumeraries should be appointed for each gun, who should be thoroughly drilled at each "station," so that they may be enabled to take the place of men on the sick list.

The position of lock determines that of first captain. If the lock be on the left side of the howitzer, he is on the left side of it, and *vice versa*.

All the men, with the exception of the first and second captains, the quarter-gunner, and No. 3, carry leather pouches slung over the right shoulder, each pouch containing one round of ammunition.



It is advisable to make the crews of smooth-bore howitzers carry shrapnel and canister, and those of rifled howitzers grape and canister, as this is the ammunition which would be needed in case of surprise.

The first captain and quarter-gunner have each a haversack slung, like the men's pouches, over the right shoulder; the former's containing a priming-wire, vent-bit, spare vent-cloth, spare lock, sight, spring-spike, rat-tail file, and a large supply of primers; the latter's a number of spare fuzes, two fuze-cutters, two spare keys for opening ammunition-boxes, and a pound of assorted nails.

The second captain wears a waist-belt, supporting a box filled with primers, and a leather or canvas case divided into two sheaths, in one of which is a priming-wire, and in the other a vent-bit.

On the march, the crew should be permitted to "slew" their pouches and haversacks "at will."

On the right side of the trail of carriage are becketed the sponge and rammer and trail-handspike; and on the left side of it, the ladle and spare sponge and rammer; a good sharp hatchet and a hammer being becketed to the axle, the former on the right, the latter on the left of the piece.

In going on a short expedition of a day or two, each man carries a blanket with his ration of bread, coffee, sugar, and pork or beef (*without bone, and cooked*) in it, strapped to his back; his tin pot and spoon being attached to the blanket-straps. Then, if a mess-kettle

be suspended from the howitzer, as in frontispiece, the crew will get along quite comfortably.

**B.** The crew being at their stations, as in **A**, to form them in line to the front—

**“CREW TO THE FRONT !”**

At this order, the men face to the front, those on the right of the gun taking a side-step to the right, those on the left, a side-step to the left, so that they may exactly cover their leaders 3 and 4, who take two side-steps to the right and left respectively. All now close up on 3 and 4, 1 and 2 taking two side-steps to the right and left, respectively, when passed by 19 and 20, and becoming the file-closers. The officer, facing to the front, takes a side-step to the right and stands fast.

**“FORWARD—MARCH !”**

All move forward, the right file filing left at the distance of six feet, the left file filing right at the distance of four feet from the muzzle of the howitzer. So soon as 1 reaches his place in the line, without filing to the left, he calls out, “Front—right dress !” when the right file faces to the front, (that is, from the piece,) and dresses on him ; and when 4 exactly covers 1, *he* comes to the front and calls out in turn, “Rear rank—front—right dress !” when the left file faces to the front and dresses on *him*. The quarter-gunner remains faced to the front, one foot in rear of the ammunition-boxes. The officer marches to the right and





c



27





alongside of 1, thus being on the right of the front rank when in line. So soon as he finds that the men are properly dressed, he gives the command—

**“STEADY FRONT !”**

NOTE.—A *rank* is composed of men abreast ; a *file*, of men placed one behind the other.

C. The crew being in line to the front, as in B, to send them to their stations, as in A.

**“TO YOUR STATIONS !”**

At this order, the front rank faces to the right, the rear rank to the left.

The officer takes post to the left, and abreast of 1.

**“MARCH !”**

The front rank files right, the rear rank files left, each man filing right or left, as may be necessary, when opposite to his station at the piece and marching to it. The officer marches by the side and to the left of 1, and takes post simultaneously with him.

D. The crew being at their stations, as in A, to commence firing—

**“COMMENCE FIRING !”**

At this order, 3 steps off with the right foot, so as to bring his body just forward of the piece, <sup>(1)</sup> and

<sup>(1)</sup> It must be distinctly borne in mind, that in sponging and ramming, 3 is at all times to keep his body clear of *the line of fire*

enters his sponge into the muzzle of it; 9 and 10 go to the trail-handspike; 11, 12, 13, 14, 15, and 16 stand at ease;<sup>(2)</sup> 17 and 18 go to the rear, to pass ammunition from the quarter-gunner to the loader; 19 and 20 open the ammunition-boxes, and hand to the quarter-gunner the ammunition, who begins cutting the fuze immediately; the first captain steps directly to the breech and adjusts the sight-bar as directed; the second captain places the vent-cloth<sup>(3)</sup> over the vent, and presses it down firmly with the thumb. The officer goes wherever he thinks he can best observe the effects of his fire, calls out to the quarter-gunner how to cut the fuze, and informs the first captain of the object to be fired at, and the elevation necessary to reach that object.<sup>(4)</sup>

*in the event of a premature discharge of the howitzer*; the same precautions being taken by 4 when entering the charge into the muzzle of the piece.

<sup>(2)</sup> 11, 12, 13, 14, 15, and 16 may be permitted to lie down, and must be detailed as "reliefs," when their services as such are needed.

<sup>(3)</sup> This is of untwilled woollen, about six inches square, and should be hung by a becket to a small hook attached to the belt of the second captain.

<sup>(4)</sup> When the sights are graduated for *degrees of elevation, or seconds of flight*, the first captain should have the distance corresponding to these marked in yards on a piece of white cloth, sewed to his left sleeve, and on the inner side of the lid of each ammunition-box, not holding grape or canister, should be marked the distance in yards corresponding to the seconds of fuze of the projectile which it contains.

**“SPONGE !”<sup>(9)</sup>**

3 pushes the sponge to the bottom of the bore, gives it a full turn *from* him, and withdraws it, and then turns it rammer-head uppermost, in readiness to ram home the charge. He now brings the right foot back, with the right heel resting against the left, and stands erect, as in **A**. The first captain points the piece at the object, calling out to 9 and 10, “Muzzle to the right!” “Muzzle to the left!” as may be necessary; and then takes hold of the elevating screw, at the bottom, with both hands in readiness to give to the piece the elevation or depression ordered; the second captain removes the vent-cloth and takes a primer from the box attached to his belt; the quarter-gunner hands the ammunition <sup>(9)</sup> to 17 or 18, who takes it, at the double-quick, to the loader, and then returns to his place in the rear.

**“LOAD !”**

4 steps off with the left foot, so as to bring his body just forward of the piece, enters the charge with his left hand, thrusting it well into the bore, and then falls back on 6, when 3 steps off with the right foot as in

<sup>(9)</sup> A moist sponge is to be used when practicable. After the crew have been thoroughly drilled in loading in detail, the order, “Sponge!” may be omitted in the exercise, the piece being sponged and loaded by the command: “Load!”

<sup>(9)</sup> The fuze must be carefully protected from moisture even of the fingers, lest it should fail to ignite.

sponging, and with the rammer pushes the charge gently and steadily *home*, (the mark on the rammer-handle indicating when the cartridge has reached the bottom of the bore,) after which, turning the rammer with the sponge end uppermost, he falls back on 5; the second captain puts a primer <sup>(7)</sup> in the vent, as soon as the rammer is withdrawn from the charge, and then takes post on his side of the piece abreast of the trail-wheel and well clear of the recoil; the first captain having satisfied himself that the howitzer is pointed and "laid" right, calls out, "Well!" when 9 unships the trail-handspike, and with 10 takes position as in A. The first captain next seizes the toggle of the lock-string with his right hand, and jumping quickly to the side of the piece, abreast of the trail-wheel and well clear of the recoil, reports: "Ready!" <sup>(8)</sup>

**"FIRE !"**

The first captain pulls the lock-string, which he has held in his hand *just* taut, promptly and firmly, and as soon as the howitzer has ceased to recoil, 5 and 7 at

<sup>(7)</sup> The cylinder of the charge need not be pierced when percussion primers are used.

<sup>(8)</sup> The captain of the gun should be instructed to throw up his left hand, as in plate D, when he reports "Ready!" as a signal to the officer conducting the firing, who may not be within the sound of his voice. He should never, however, omit calling out loudly, "Ready!" at the same time, to notify his own crew to keep clear of the recoil.





the right, and 6 and 8 at the left wheel run it up to its former position. <sup>(9)</sup>

All now take their stations in readiness to sponge, load, etc., etc., etc., as before, while the second captain pulls from the vent any pieces of the quill that may remain there, and enters the bit to clear it entirely through.

At the command, "Cease firing!" the piece, if loaded, is fired and sponged, and the ammunition-boxes closed, after which all take their stations as in **A**.

**E.** The crew being at their stations as in **A**, to move the piece to the front by hand—

**"TO THE FRONT BY HAND!"**

All face to the front, 5 and 7 propel the right, 6 and 8 the left wheel, 10 puts down and bolts the trail-wheel, and then with 9, guides the piece by the trail-handpike, 17 and 19 carry the right, 18 and 20 the left ammunition-box; the quarter-gunner takes the drag-rope. The other men keep their stations as in

<sup>(9)</sup> The charge may refuse fire; if this arises from not properly drawing the lock-string, it will be evident at sight, as the wafer of the primer will not flash, in which case the second captain 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 second captain will remove the residue of the primer, pass the bit down the vent, and insert another primer.

plate **E**, and must be careful when the order, "March!" is given to step off together with the left foot, and while marching, to preserve their exact distances from each other. The officer marches a little outside of the right file and abreast of the trail-wheel.

**F.** The men being at their stations, as in **A**, to move the piece to the rear by hand—

**"TO THE REAR BY HAND!"**

Executed as in **E**, except that all face to the rear, the right file turning to the left, the left file to the right. The quarter-gunner is now in the lead.

**G.** The piece being at a halt, with the men stationed in readiness to move it to the "front by hand," as in **E**, to move it to the rear by hand—

**"TO THE REAR BY HAND!"**

All face to the rear, turning to the right, in readiness to move the piece to the rear, stepping off with the left foot at the order :

**"MARCH!"**

Should the piece be *en route*, the command, "To the rear by hand!" is simply a precautionary one, the men facing about and marching to the rear at the order: "March!"

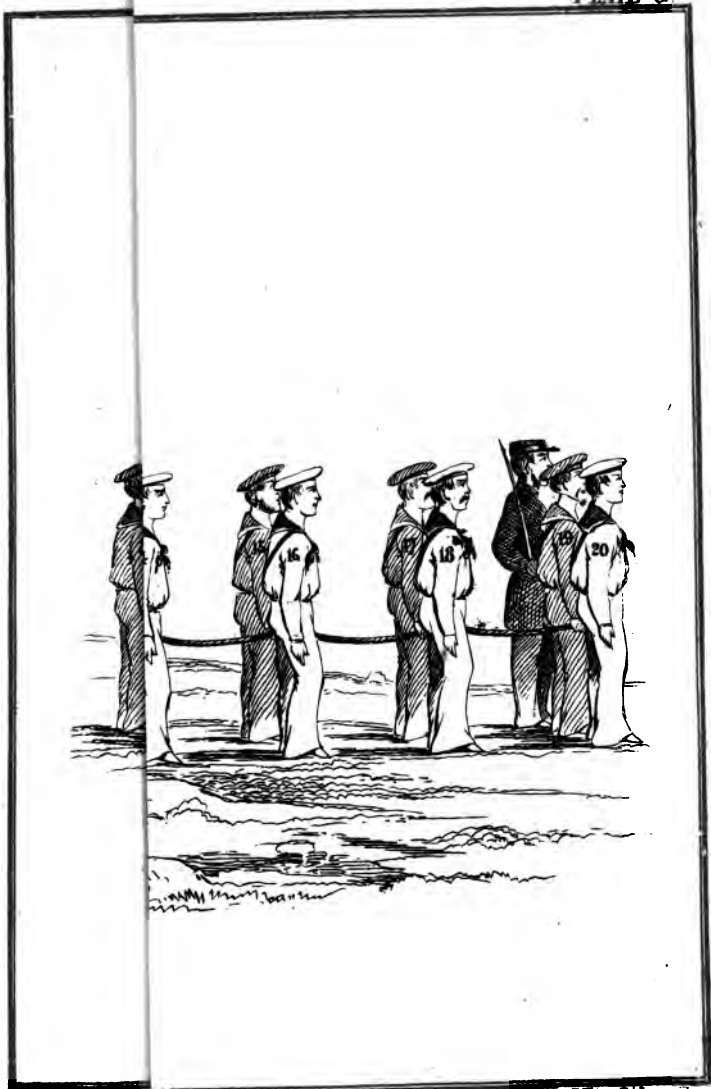
Great care must be taken in this manœuvre not to *lose the step*.







PLATE G



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H. The crew being at their stations, as in A, to man the drag-rope and commence the march—

**“MAN THE DRAG!”**

At this order 3 places cover on sponge, and becketts it on the right side of the trail; 4 becketts spare sponge and ladle on the left side of trail; 9 unships trail-hand-spike, and becketts it on right side of trail; 10 puts down and bolts the trail-wheel; 17 and 19 screw up the right ammunition-box, and place it securely on the right side of the howitzer; 18 and 20 screw up the left ammunition-box, and place it securely on the left side of the howitzer; the first captain removes the sight-bar, and places it in his haversack; second captain assists 10 at the trail-wheel; quarter-gunner hooks the drag-rope. All now take their places as in Plate G, the quarter-gunner marching about two feet in rear of the howitzer, and exactly covering it, with 3<sup>(1)</sup> and 4 abreast of and “touching elbows” with him; 5 and 6 abreast of axle of wheels; the first and second captains at guiding-ropes, and all the other men manning the drag, 19 and 20 being in the lead.

At the order, “March!” all step off with the left foot.

<sup>(1)</sup> In ascents, 3 and 4 assist 5 and 6 at the wheels; and in descents, man the check-ropes. A very steep hill should be descended *muzzle foremost*, the drag-rope then serving as a check; while 3 and 4 at the check-ropes, 5 and 6 at the wheels, and the first and second captains at the guiding-ropes, steady the piece.

I. The crew being at their stations, as in **A**, to dismount the howitzer and remove the wheels of carriage

**“PREPARE TO DISMOUNT THE PIECE AND CARRIAGE!”**

3, facing aft, removes washer and pin of loop-bolt and attends at muzzle; 4, facing aft, removes loop-bolt and attends at muzzle; 5 and 6 remove washers and lynch-pins of wheels, and then take hold of the forward spokes of wheels; 7 and 8 take hold of the after spokes of wheels; 9 unships the handspike from the socket of trail, and hooks it into the thimble of the strap around the neck of the cascabel; and then goes to the extreme end of the forward part of the handspike, on the right side of the piece, and faces aft; 10 puts down and bolts the trail-wheel, and then goes to the extreme end of the forward part of the handspike on the left side of the piece, and faces aft; 11 and 12 go to the extreme ends of the after part of the handspike, on their respective sides, and face forward; 13 and 14 go forward of the axle of carriage on their respective sides, between the wheels and the piece, and face aft; 15 and 16 go to the handspike between 11 and the trail and 12 and the trail, respectively, and face forward; 17 and 18 take hold of the braces of the carriage on their respective sides, just below the elevator; 19 and 20 go to the end of the trail; the first captain removes the lock and sight-bar, and then takes post on his side of the piece abreast of the trail-wheel as in Plate **H**, and faces forward; the second captain, having removed the elevator,





J. Ben. Lithograph

HOWITZER DISMOUNTED.

A. Van Nostrand Publisher



takes a corresponding position on the opposite side of the piece. The officer takes post at will.

**“DISMOUNT !”**

3 and 4 bear the muzzle of the piece to the ground, while the men at the handspike raise the breech; 13 and 14 relieve 15 and 16 at the handspike, as soon as the howitzer is clear of the carriage, who then take hold of the braces of the carriage close to the axle. The carriage is now wheeled its length away from the piece by 15, 16, 17, 18, 19, and 20, and laid upon the ground, its wheels being taken off by 5, 6, 7, and 8; and the howitzer lowered at the same time by the handspike men, 9, 10, 11, 12, 13, and 14. The officer and men now lie “at ease” on the ground as in Plate I.

The object in dismounting a howitzer and carriage is that it may offer the least possible target to a fire which cannot or must not be returned, and for the purpose of placing it in ambush, which may be very readily done with artillery worked by hand. In order that the crew may gain such shelter as may be near, the command “Disperse!” is given, when the men seek the cover of trees, rocks, etc., as in Plate J, each one taking care to keep on *his* side of the gun and not to go farther than fifty yards from it, and to carry off with him what he has removed from it or the carriage in dismounting, thus 3 and 4 take loop-bolt with its washer and pin; 5, 6, 7, and 8, the wheels with their washers and linch-pins; 9, the trail-handspike; the first captain, lock and sight-bar; second captain, the elevator, etc.,

etc. 3 and 4, beside loop-bolt, etc., must be mindful to take with them both sponges. 17, 18, 19, and 20 removing the ammunition-boxes, and the quarter-gunner the drag-rope, so that nothing is left upon the field but the piece and carriage.

Upon the command, "Retreat!" being given, the men move to the rear at the double-quick, carrying off with them the same articles as before. To summon the men to the howitzer again when dispersed or while retreating, the command, "Rally!" must be given.

J. The howitzer and carriage being dismounted, as in Plate I, to mount them again.

**"PREPARE TO MOUNT THE PIECE AND  
CARRIAGE!"**

3 and 4 steady the muzzle; 5, 6, 7, and 8 raise the wheels; 9, 10, 11, 12, 13, and 14 raise the breech; 15, 16, 17, 18, 19, and 20 raise the carriage; the officer, first and second captains, and quarter-gunner rise to their feet.

**"MOUNT!"**

5, 6, 7, and 8 now put on wheels, when the carriage is run up to the howitzer, and the howitzer mounted, the loop-bolt, washer and pin, elevator, etc., etc., being replaced by the men who removed them when the piece was dismounted. Officer and men now take their stations as in A.

Where a howitzer mounted on its carriage has been overturned, the men have but to "pick it up" and "right" it.



D. Van. No.

J. Eten Lithographer





J. Egan, Lithographer.

HOISTING THE HOWITZER.

D. Van Nostrand, Publisher.





**K.** The howitzer being on the march, as in Plate **G**, to hoist it on an eminence.

**“PREPARE TO HOIST THE PIECE AND CARRIAGE!”**

3 and 4 unbecked the ladle and sponges, and place them on the ground by the side of the howitzer; 5, 6, 7, and 8 seize the upper block of the tackle used for this purpose and hook it into a selvagee-strap, which they place around the body, branch, or stump of a tree on the eminence indicated; they then take post in readiness to receive and land the howitzer when it is hoisted. 9 and 10 take hold of the lower block of the tackle and hook it into a selvagee-strap placed around the piece and carriage as in Plate **K**. 17, 18, 19, and 20 remove the ammunition-boxes from the carriage and place them on the ground. The quarter-gunner and first captain take hold of the end of the drag-rope, which is now used as a guy to steady the piece with; the other men man the tackle.

At the order, “Hoist!” the howitzer is quickly hoisted, the ammunition-boxes, ladle, and sponges being afterward run up, when the officer and men rejoin their piece. Each section of a battery should be provided with a half-dozen selvagee-straps and a light tackle.

The howitzer may be lowered from an eminence by the same method, inversely.

**L.** The howitzer being on the march, as in Plate **H**, to bring it into action to the front.

**“FIRE TO THE FRONT—IN ACTION!”**

3 unbeckets and removes the cover of the sponge, 4 unbeckets the ladle and spare sponge, and places them abreast of the left wheel of the howitzer, about two yards outside of the left file; 5, 6, 7, and 8 take hold of spokes of wheels; 9 unbeckets handspike and ships it in socket of trail, and with 10 (who unbolts and throws up the trail-wheel) and the men at wheels of carriage, turns the howitzer to the right-about, the right wheel being the pivot; (1) 17, 18, 19, and 20 carry the ammunition-boxes to the rear; the quarter-gunner un-hooks the drag-rope and coils it down between the ammunition-boxes.

Officer and men now take their stations, as in A, and await the order to commence firing.

To come into action to the right, the order would be, “Fire to the right—in action!” to the left, “Fire to the left—in action!” to the rear, “Fire to the rear—in action!”

When the howitzer is already in action, and it be desired to change the direction of the fire, the orders are simply, “Fire to the front!” “Fire to the rear!” “Fire to the right!” “Fire to the left!”

<sup>(1)</sup> 17 and 18 take hold of forward grommets of ammunition-boxes, 19 and 20 of after ones. They should be particularly careful to place the boxes on the ground, just as they were on the carriage, as they are thereby saved the fatigue (which in a long drill would be considerable) of turning the boxes around, in replacing them on the carriage.

**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 take off their equipments, and lay them on the ground. At the command, "March!" each man takes the place and equipments of the one on his front; thus 5 takes the place of 3, 7 of 5, 6 of 4, 8 of 6, etc., etc.; 3 and 4 marching to the rear, and taking the places of 19 and 20 respectively. After being thoroughly drilled in this way, the men should be compelled to change sides, and then "change stations" as before.

**SERVICE AND EXERCISE WITH REDUCED CREWS.**

When a man is disabled, his place will be supplied by the next man in his rear, unless the chief of piece directs otherwise; thus the place of 3 will be taken by 5, that of 4 by 6, etc. etc. etc.

Service of the piece by two men: the first captain commands, points, serves the vent, and fires; No. 1 sponges, loads, and serves ammunition.

Three men: the first captain commands, points, serves the vent, and fires; No. 1 sponges and loads; No. 2 serves ammunition.

Four men: the first captain commands, points, serves the vent, and fires; No. 1 sponges; No. 2 loads; No. 3 serves ammunition.

Five men: the first captain commands and fires; No. 1 sponges; No. 2 loads; No. 3 serves vent, and points; No. 4 serves ammunition.

Six men: the first captain commands and fires; No. 1 sponges; No. 2 loads; No. 3 serves vent, and points; No. 4 serves ammunition; No. 5 attends ammunition-boxes.

### SCHOOL OF THE BATTERY.

A battery consists of four, six, or eight howitzers.

A battery of eight howitzers is divided into four sections, of two howitzers each, denominated *the right, the left, the right centre, and the left centre* sections.

Its half batteries are called right and left half batteries.

A battery should be commanded by a lieutenant; a section by a master or ensign; a howitzer by a midshipman, or master's mate.

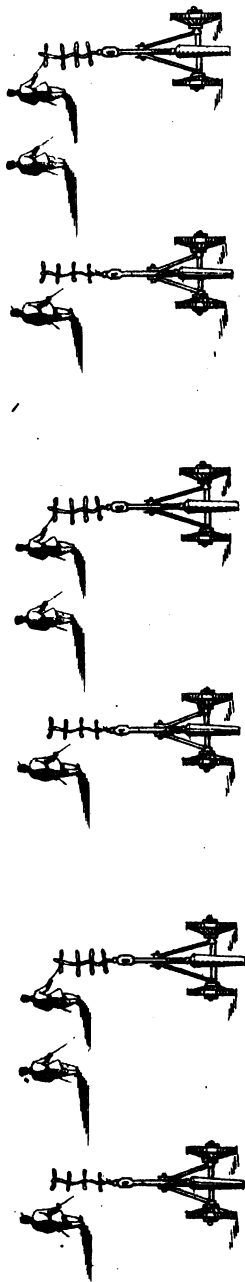
The senior master or ensign should command the right section, the next in rank the left, the third the right centre, and the fourth the left centre.

The battery is said to be in line when its howitzers are abreast of each other, with their drag-ropes manned, (Plate 1,) and in column of pieces or sections, when its pieces or sections are formed one after the other. (Plate 2.)

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

The *distance* is a space measured perpendicular to the front.

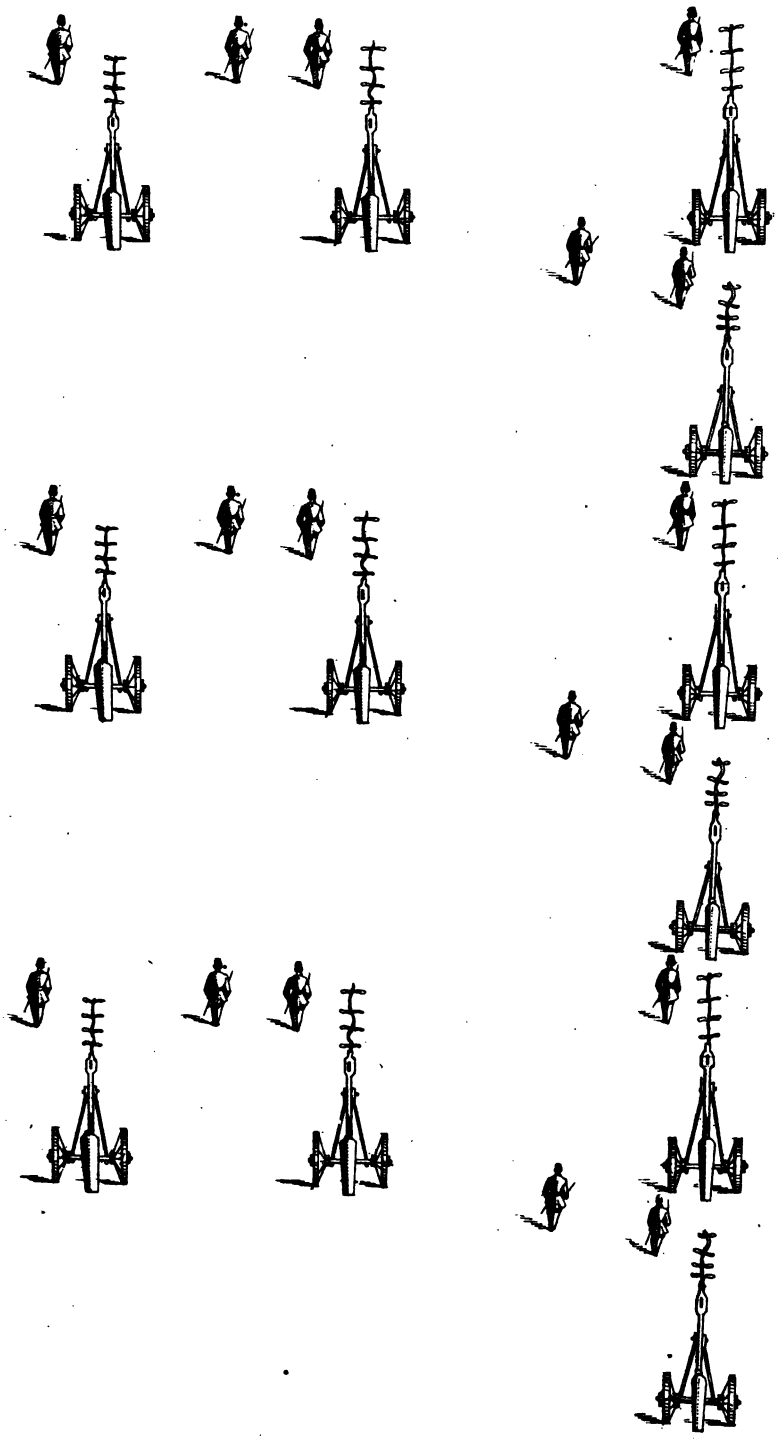
BATTERY IN LINE.





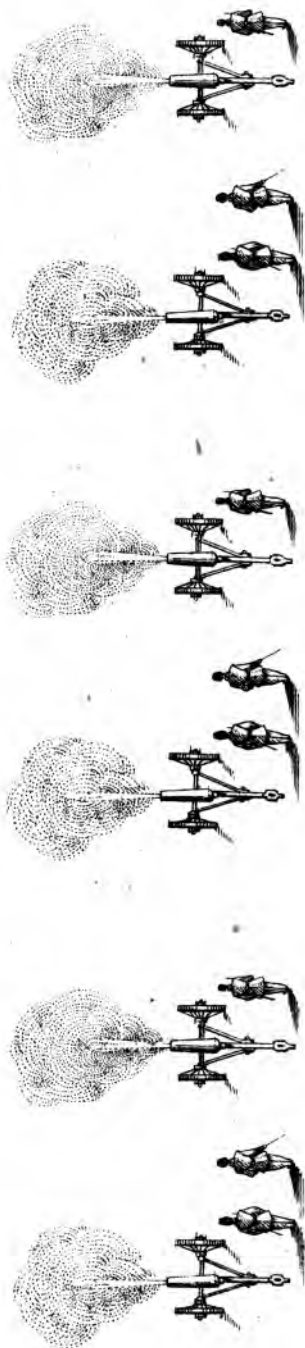
COLUMN OF SECTIONS.

COLUMN OF PIECES.









BATTERY IN ACTION.



When in line, the interval between the howitzers of a battery must be such as will permit of their being formed in column of pieces, by wheeling to the right or left, (Article 14,) with the distance of two yards between the muzzle of the leading howitzer of each section and the leaders at the drag-rope of the rear one. This measure is, therefore, not a fixed one, but dependent upon the length of the drag-rope.

In the order in action the pieces are pointed toward the enemy, ready for firing; and the interval is the same as the interval in line. (Plate 3.) In column of sections the *interval* between the howitzers is the same as the interval in line, or in action; the *distance* between the sections is four yards, plus the length of a howitzer and drag-rope. By plying a battery "in line" into "column," *by wheeling, by sections, to the right or left*, and then deploying them into line again, the above will be apparent. This is "open order," and upon the command, "Close Order!" the sections will close to within two yards of each other, the *interval* between the pieces remaining the same as in open order.

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

The right or left of a battery is always that of the actual front. Thus the right piece, section, or half battery, of a battery in line, would become the left piece, section, or half battery, in action upon the order, "Fire to the Rear!"

In manœuvring a battery, one piece must always be designated as the guide, by which the movements of the other pieces are to be regulated; and the chief of the guiding-piece is to be particularly careful to make his men preserve a regular gait, etc. etc. In column, this piece would be in the lead; in wheeling, on the pivot flank; and in line, or in action, on the right or left flank.

A wheel is ninety degrees to the right or left.

A half-wheel is forty-five degrees.

An oblique is less than a half-wheel.

My reason for changing the signification of *the oblique*, as laid down by military authorities, is that in manœuvring I have often been embarrassed thereby. I have not unfrequently, for instance, desired to move *less* to the right or left than forty-five degrees, and have been at a loss for a *command* that would express my desire to the battery. By my method, I have simply to point out to the guiding-piece the direction I wish to take, after I have given the order, "Right (or left) oblique;" the *commands*, "Battery, (or column) by pieces—Right (or left) half wheel!" serving to march the battery (or column) in a direction deviating exactly forty-five degrees to the right or left of the original one.

Alignments are made in *all formations* upon the wheels of the carriages.

Upon the order, "Right (or left) about!" the piece is turned as short round as possible, to the right or left, until its muzzle is pointed in a direction directly opposite to the original one.

The officer in charge of each piece is called the "chief of the piece," and the one commanding a section, the "chief of the section."

With the men at their "stations," the chief of section takes post on a line with and midway between the trail-wheels of his pieces, and faces forward.

When the crews are "in line to the front," the chief of section is in line with and midway between the front ranks of his command, to which post he marches from "stations," with the chief of his left piece, upon the order: "Crews to the front—march!"

At the command, "To your stations!" he faces to the right filing right, and marching to his post with the chief of his left piece, upon the order: "March!"

In moving to the "front or rear by hand," the chief of section marches in line with and midway between the trail-wheels of his pieces.

In "column of pieces" he is four yards distant from the left flank, abreast of the centre of his section.

In column of sections and line, his post is midway between and in line with the leaders at the drag-ropes.

In action, his proper place is *wherever his services are most needed.*

The commanding officer of a battery should have no fixed post in line, action, or column, but be at liberty to move from place to place, as the exigencies of the service may require.

In the following manœuvres, the battery is supposed to consist of six pieces.

Where it is necessary to economize space, battery

manceuvres may very well be taught and learned by substituting men for guns. (Plate 4.) Every quarter-deck is large enough for this.

1.

The battery being in line, to form it into column of pieces from the right, the lieutenant commands :

1. By piece—from the right—front into column !
2. March ! (Plate 5.)

At the command, " March !" the right piece marches direct to the front, and the lieutenant 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 two yards behind.

Each chief of section directs the march of his carriages, which are so conducted by their chiefs as to enter the column by the most simple movement.

The column may be formed from the left inversely, according to the same principles, upon the order : " By piece—from the left—front into column !"

TO FORM SECTIONS.

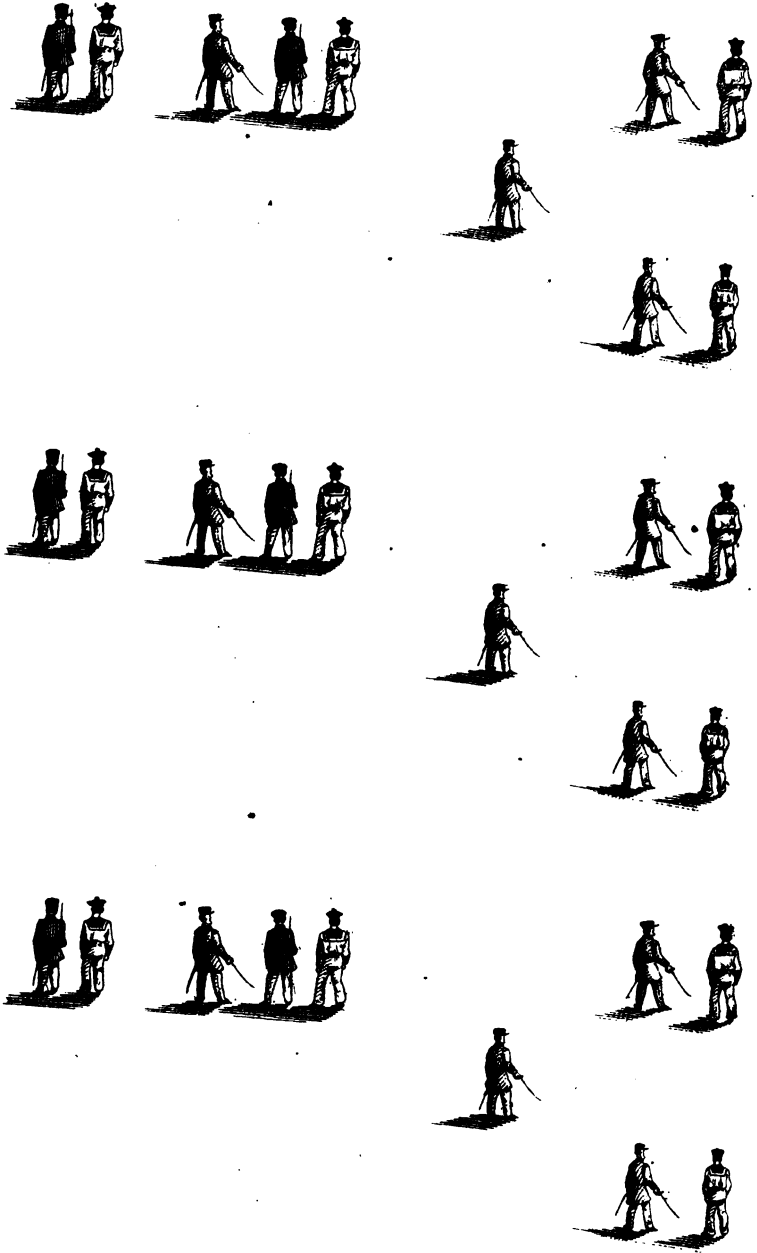
2.

The battery being in column of pieces, to form sections by gaining ground to the left, the order is :

1. Form sections—left oblique !
2. March !
3. Guide —— ! (Plate 6, Fig. 1.)

COLUMN OF SECTIONS.

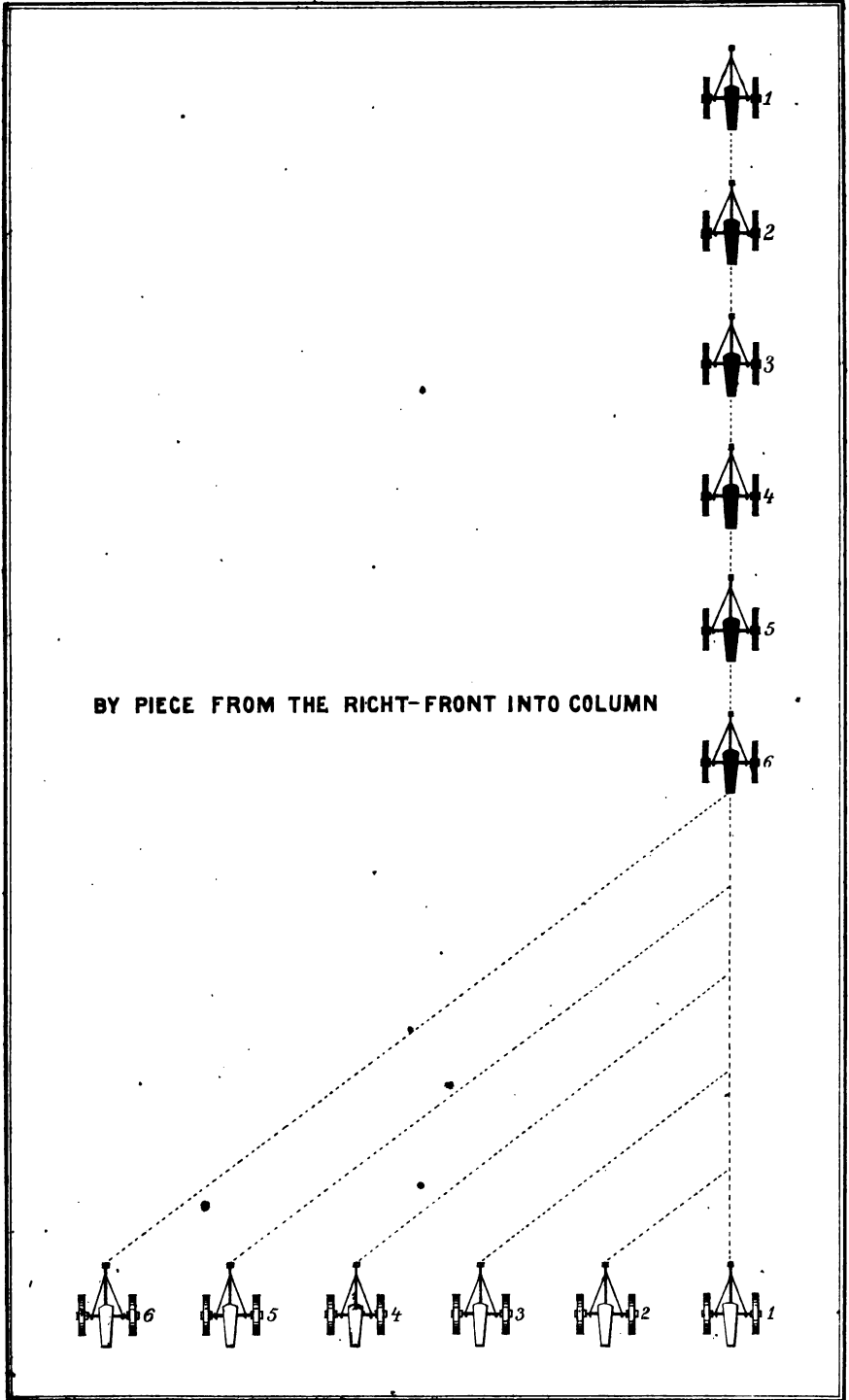
COLUMN OF PIECES.



EXERCISE FOR INSTRUCTION IN BATTERY - MANOEUVRES ON BOARD SHIP, THE MEN SERVING AS PIECES!



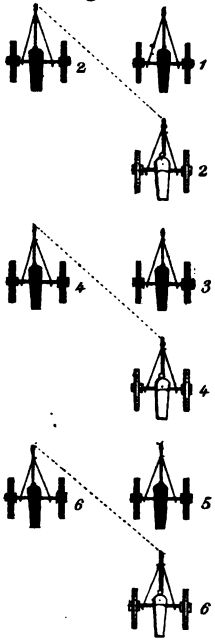




BY PIECE FROM THE RIGHT-FRONT INTO COLUMN

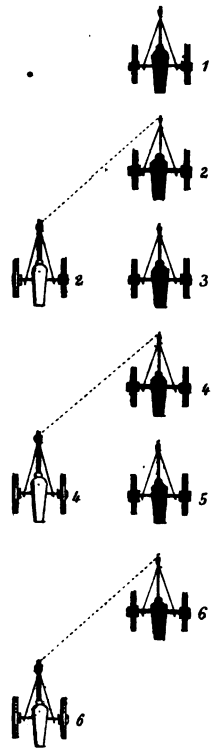


Fig 1.



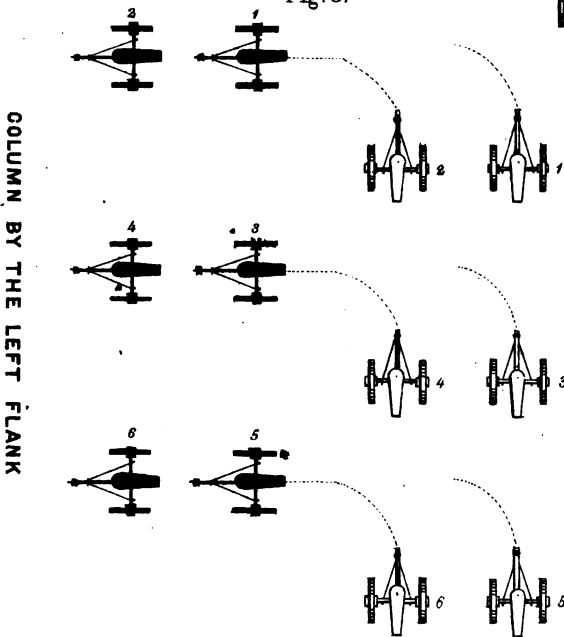
FORM SECTIONS LEFT OBLIQUE.

Fig. 2.



BY THE RIGHT - BREAK SECTIONS.

Fig. 3.



COLUMN BY THE LEFT FLANK



The chiefs of sections repeat the commands after the lieutenant.

At the command, "March!" the second, fourth, and sixth pieces oblique to the left until abreast of the first, third, and fifth, and gain their proper interval.

Sections may be formed by gaining ground to the right, according to the same principles, by inverse means, upon the order: "Form sections—right oblique!"

### TO MARCH BY A FLANK.

#### 3.

The battery being in column of sections, to gain ground to the left, the order is:

1. Column, by the left flank!
2. March! (Plate 6, Fig. 3.)

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 lieutenant commands:

1. Forward!
2. Guide ——!

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 sections take post as in "column of pieces."

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

1. Battery, by the right flank!
2. March!
3. Forward!
4. Guide ——!

The commands, "By the right flank!" "March!" "Forward!" "Guide ——!" are repeated by the chiefs of sections.

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

1. Battery, by the left flank!
2. March!
3. Forward!
4. Guide ——!

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

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."

When the sections are marching by a flank, they can be deployed into line or into action, by the commands, "Forward into line, (or into action)—right (or left) oblique—march!"

#### OBLIQUE MARCH

##### 4.

The battery being in column, to cause it to march obliquely, to gain ground to the front and left, the order is:

1. Column, left oblique!
2. March!
3. Guide ——!

The chiefs of sections repeat the commands, "Left oblique!" "March!" "Guide ——!" At the command, "March!" all the pieces oblique at once to the left, and march in the new direction, indicated by the lieutenant to the guiding piece, moving in parallel lines and preserving their intervals.

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

To resume the original direction, the lieutenant commands: "Forward—march!" These commands are repeated by the chiefs of sections, and the pieces resume the original direction by obliqueing to the right.

The right oblique is executed according to the same principles, and by inverse means, upon the order: "Column, right oblique!"

#### ABOUT IN COLUMN.

##### 5.

The battery being in column, to face it to the rear, the order is:

1. Pieces, right (or left) about!
2. March!

These commands are repeated by the chiefs of sections, and at the second, all the pieces execute the about.

When the movement is nearly completed, the lieu-

tenant commands, "Column—forward—guide ——!" his orders being repeated by the chiefs of sections.

### TO CHANGE DIRECTION IN COLUMN.

#### 6.

The battery being in column, to cause it to change direction to the left, the order is:

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 axles of his carriages are on a line with the left wheel of the pivot-carriage of the preceding section, and the command, "Forward!" must be given as soon as his pivot-carriage has entered the new direction.



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

An oblique change of direction of  $45^\circ$  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) half-wheel.

An oblique of less than  $45^\circ$  would be executed by the commands, "Head of column—(left or right) oblique!" and the direction would then be given to the guiding piece.

#### TO DIMINISH THE FRONT OF A COLUMN ON THE MARCH.

##### 7.

The battery being in column of sections to form column of pieces from the right, the orders are:

1. By the right—break sections!
2. March! (Plate 6, Fig. 2.) These commands are repeated by the chiefs of sections. At the command, "March!" the right carriages continue forward, the left carriage of each section halting until the wheels of the right carriage are abreast of its leaders at the drag-rope, when it obliquely to the right and comes into column behind the right carriage. This formation is executed from the left, according to the same principles by inverse means.

**TO PASS FROM THE ORDER IN COLUMN TO THE ORDER IN LINE, AND THE REVERSE.**

**8.**

The battery being in column, to form it into line on the head of the column, gaining ground to the left, the orders are :

1. Forward into line—left oblique !
2. March !
3. Guide right ! (Plate 7, Fig. 1.)

At the first command, the chief of the leading section commands, "Section—forward—guide right !" and the chiefs of the other sections: "Section—left oblique—guide right !" At the command, "March !" repeated by the chiefs of sections, the leading section halts, and its chief commands: "Section—halt—right—dress !" Each of the other chiefs of sections repeats the command, "March !" and conducts his section by a left oblique to its proper interval from the section on its right and one yard in rear of it. He then commands: "Section—forward—halt—right—dress !"

The movement is executed on the opposite flank, according to the same principles, by inverse means. In this case the commands are: "Forward into line—right oblique—march—guide left !"

After the battery is aligned, the lieutenant commands: "Front !" He continues the march by the commands :

1. Battery—forward !
2. March !
3. Guide right (or left) !

FORWARD INTO LINE.—LEFT OBLIQUE.

Fig. 1.

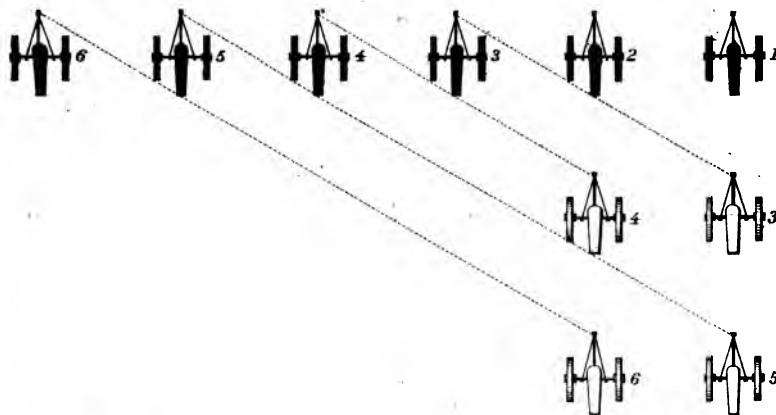
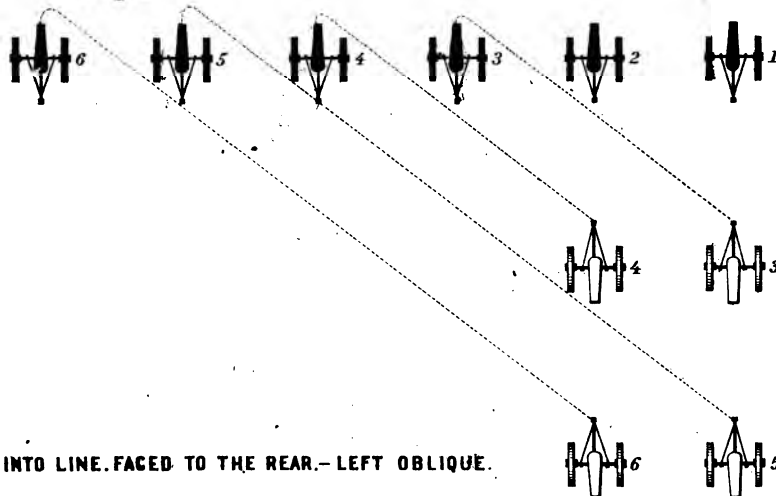


Fig. 2.



INTO LINE, FACED TO THE REAR.—LEFT OBLIQUE.



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—halt!—left piece—left oblique!"

#### TO FORM LINE FACED TO THE REAR.

##### 9.

The battery being in column, to form it into line faced to the rear, on the head of the column, gaining ground to the left, the orders are:

1. Into line faced to the rear—left oblique!
2. March!
3. Guide right! (Plate 7, Fig. 2.)

\* At the first command, the chief of the leading section commands, "Pieces—left about!" and the chiefs of the other sections: "Section—left oblique!"

At the command, "March!" repeated by the chiefs of sections, the leading section executes the about; the other sections obliqueing to their proper place in line, and executing the about *without halting*, upon the order from their chiefs: "Pieces left about—march!" As each section is near completing the about, its chief commands: "Section—halt—left—dress!" When the left section arrives upon the line and is wheeled about, the right (*now the left*) section should move to the front, until it is about a yard in advance of the other sections, when the lieutenant commands: "Battery—halt—left—dress!" When the battery is aligned the lieutenant commands: "Front!"

The movement is executed on the opposite flank,

according to the same principles, by inverse means. In this case the commands are: "Into line faced to the rear—right oblique—march—guide left!"

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

#### TO FORM LINE TO THE RIGHT OR LEFT.

##### 10.

The battery being in column, to form it into line to the left, the orders are:

1. Sections—left wheel!
2. Guide left!
3. March! (Plate 8, Fig. 1.)

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 lieutenant commands: "Battery—halt—left—dress!" The commands, "Halt—left—dress!" are repeated by the chiefs of sections, and when the alignment is completed the lieutenant commands: "Front."

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

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

SECTIONS - LEFT WHEEL.  
Fig. 1.

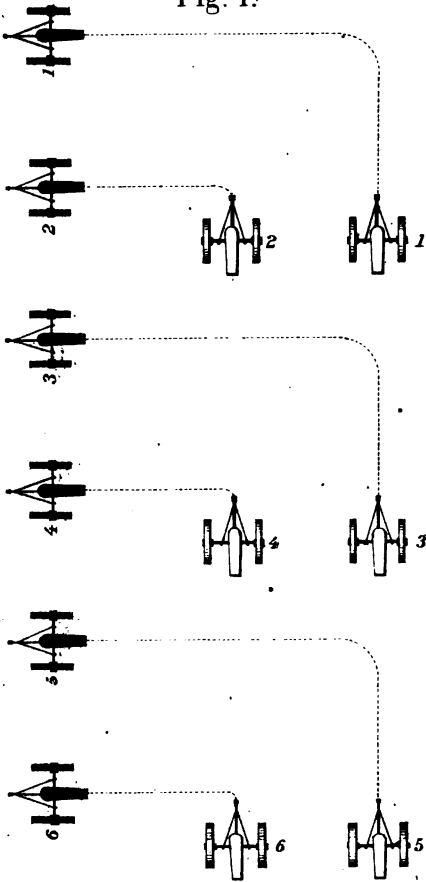
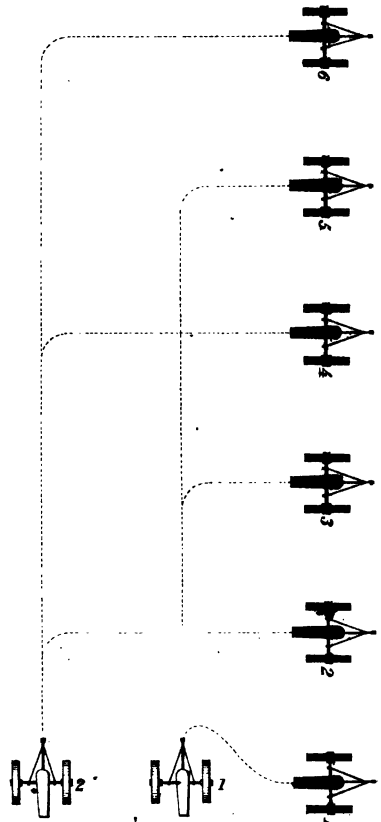
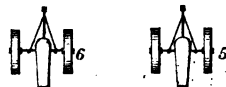
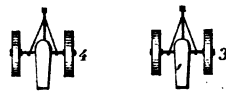


Fig. 2.



ON THE RIGHT INTO LINE.







## TO FORM LINE ON THE RIGHT OR LEFT.

## 11.

The battery marching in column, to form it into line on the right, the orders are :

1. On the right into line!
2. March!
3. Guide right! (Plate 8, Fig. 2.)

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 unmasks the column, he commands: "Section—halt—right—dress!"

The chiefs of the other sections command, "Section—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 as given to the first section. 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 lieutenant commands: "Front!"

The line is formed on the left, according to the same principles, by inverse means. The commands are: "On the left into line—march—guide left!"

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

## TO BREAK INTO COLUMN TO THE FRONT.

## 12.

The battery being in line, to break into column of sections to the front from the right, the orders are :

1. By section—from the right—front into column !
2. March !
3. Guide —— ! (Plate 9, Fig. 1.)

At the first command, the chief of the right section commands, "Section—forward !" and the chiefs 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 —— !" after the section on his right has commenced the movement, and when his leaders at the drag-ropes are abreast of the wheels of the left carriage of that section.

After obliqueing sufficiently to gain the rear of the preceding section, he commands : "Forward !"

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

## TO BREAK INTO COLUMN TO THE REAR.

## 13.

The battery being in line, to break into column to the rear from one of the flanks, the lieutenant executes an about, then halts the battery, and breaks it into column to the front by the preceding manœuvre.

BY SECTION-BREAK FROM THE RIGHT TO MARCH TO THE LEFT.

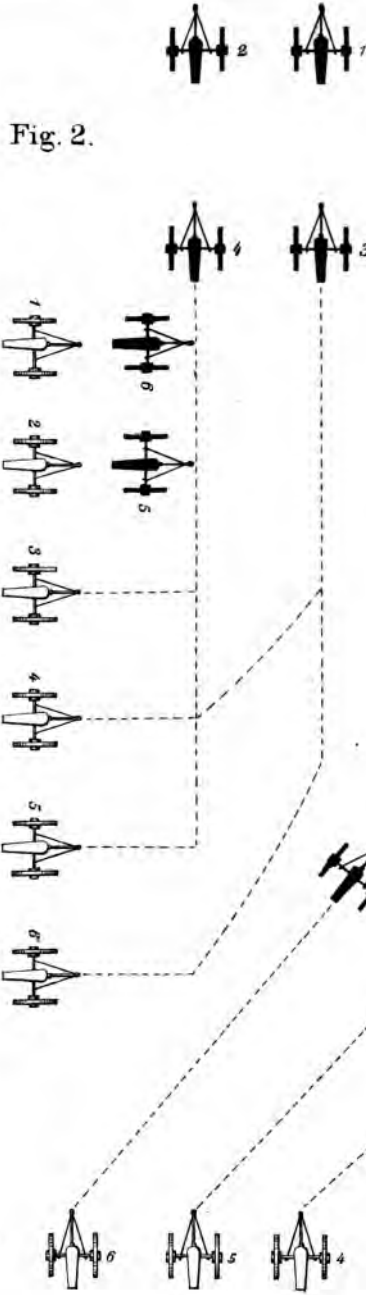
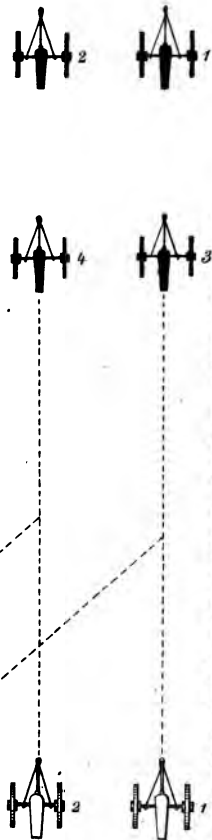


Fig. 2.

Fig. 1.



BY SECTION-FROM THE RIGHT-FRONT INTO COLUMN.



**TO BREAK INTO COLUMN TO THE RIGHT OR  
LEFT.**

**14.**

The battery being in line, to break it into column to the left, the orders are :

1. Sections—left wheel !
2. March !

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 lieutenant commands, "Forward—guide left !" his orders being repeated by the chiefs of sections.

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

A column of pieces is formed by the commands :

1. Pieces—left wheel !
2. March !

**TO BREAK INTO COLUMN OF SECTIONS TO  
THE FRONT FROM ONE FLANK, TO MARCH  
TOWARD THE OTHER.**

**15.**

The battery being in line, to break from the right to march to the left, the orders are :

1. By section—break from the right—to march to the left !
2. March !
3. Guide left ! (Plate 9, Fig. 2.)

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 far enough to pass the line at the distance of two yards from the leaders at the drag-ropes, he changes the direction to the left by the commands: "Section—left wheel—march!" Each of the other chiefs of sections commands; "Section—forward!" in time to command, "March!" when the wheels of the carriages of the section preceding his have passed the leaders at the drag-rope of his left piece. He then commands, "Section—left wheel!" giving the order of execution, "March!" when the axles of his carriages are on a line with the left wheel of the pivot-carriage of the preceding section.

As soon as the pivot-carriage of each section enters the new direction, its chief commands: "Section—forward—guide left!"

The battery is broken from the left to march to the right, according to the same principles, 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!

**TO BREAK INTO COLUMN TO THE REAR  
FROM ONE FLANK TO MARCH TOWARD  
THE OTHER.**

**16.**

The battery being in line, to break to the rear from one flank to march toward the other, the lieutenant first

Fig. 1.

DOUBLE COLUMN ON THE CENTRE.

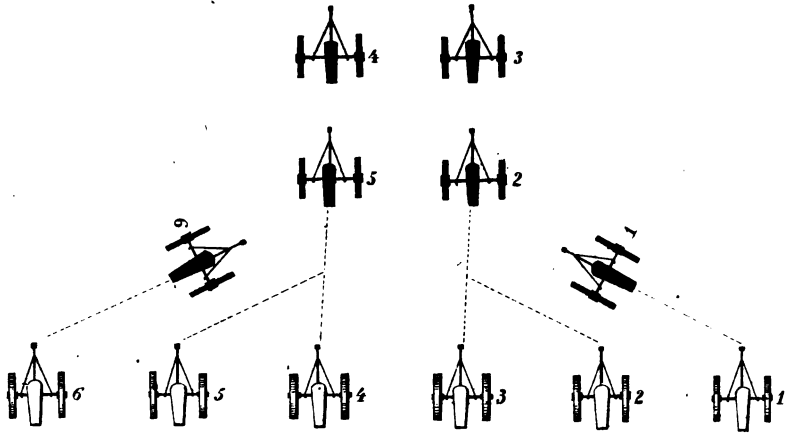
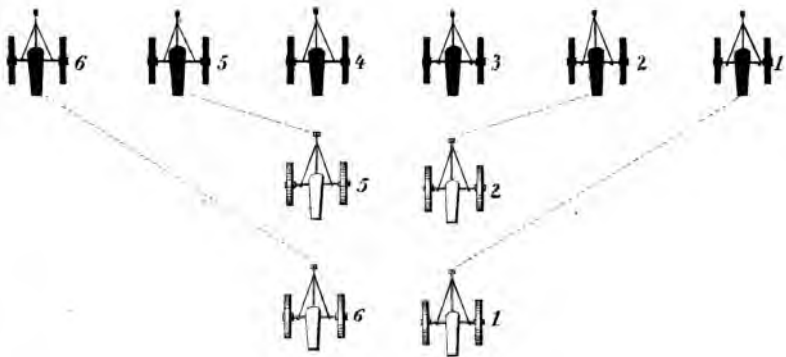


Fig. 2.



FORWARD INTO LINE.





executes an about. He then halts the battery and executes the preceding manoeuvre.

### TO FORM DOUBLE COLUMN ON THE CENTRE SECTION.

#### 17.

The battery being in line, to form double column on the centre section, the orders are :

1. Double column on the centre !
2. March !
3. Guide! (Plate 10, 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 sections, the centre 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.

When the double column is formed, the chief of the centre section takes post as in column of sections; the chiefs of the other sections are four yards outside of the column, abreast of the centres of their sections. When the battery consists of eight pieces, the chief of the right centre section commands, "Left piece—forward!—right piece—left oblique!" the chief of the left centre section, "Right piece—forward!—left piece—right oblique!" the chiefs of the right and left sections give the same orders as before. When the double columns of eight pieces is formed, *all* the chiefs of sections take post four yards outside of the column, abreast of the centres of their sections.

**TO DEPLOY THE DOUBLE COLUMN INTO  
LINE TO THE FRONT.**

**18.**

The battery being in double column, to form it into line to the front, the orders are:

1. Forward into line!
2. March! (Plate 10, Fig. 2.)

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!" the chief of the centre section: "Section—halt!" At the command, "March!" repeated by the 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 on the centre section. without command.

As soon as the battery is aligned, the lieutenant commands: "Front!" When the double column consists of eight pieces, to deploy it into line to the front, the chiefs of the right and left centre sections command, "Leading piece—halt!—Rear piece—right (or left) oblique!" the chiefs of the other sections giving the same orders as in deploying into line the double column of six pieces.

**TO DEPLOY THE DOUBLE COLUMN INTO LINE  
TO THE RIGHT OR LEFT.**

**19.**

The battery being in double column, to form it into line to the right, the orders are:

1. To and on the right into line!
2. March!

At the first command, the chief of the centre section commands, "Section—right wheel!" the chief of the right section, "Section—by pieces—right wheel!" and the chief of the left section: "Section—forward!"

At the second repeated by the chiefs of sections, the centre section (by section) and the right section (by pieces) wheel to the right, and are 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 lieutenant commands: "Front!"

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

When the column consists of eight pieces to deploy it into line to the right, the chiefs of the right and right centre sections command, "Section—by pieces—right wheel!" the other chiefs of sections: "Section—forward!"

#### TO ADVANCE IN LINE.

##### 20.

The battery being in line, to cause it to advance, the lieutenant indicates to the guide the points on which he is to march, and commands:

1. Battery forward!
2. March!
3. Guide ——!

The commands, "Forward—march—guide ——!" 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.

##### 21.

When the battery is marching in line, to halt and align it, the orders are:

1. Battery—halt!
2. Right (or left) dress!

The commands, "Halt!—right (or left) dress!" are repeated by the chiefs of sections.

The lieutenant superintends the alignment, placing himself for that purpose on the flank of the guide. When the battery is aligned, the lieutenant commands: "Front!"

## TO MARCH BY A FLANK.

## 22.

The battery being in line, to cause it to move in the direction of one of its flanks, the orders are:

1. Battery—by the right (or left) flank!
2. March!

The commands, "By the right (or left) flank!" are repeated by the chiefs of sections. At the command, "March!" each piece wheels at once to the right, (or left,) and when the wheel is nearly completed, the lieutenant orders: "Forward!"

## OBLIQUE MARCH.

## 23.

The battery being in line, to cause it to march obliquely, to gain ground to the front and left, the orders are:

1. Battery—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 pieces oblique at once to the left, the lieutenant giving the direction to the guiding-piece. To resume the original direction, the lieutenant commands: "Forward—march!"

## ABOUT IN LINE.

## 24.

The battery being in line, to face it to the rear, the orders are:

1. By pieces—right (or left) about!
2. March!

These commands are repeated by the chiefs of sections, and at the second all the pieces execute the about.

When the movement is nearly completed, the lieutenant commands, "Battery—forward—guide ——!" his orders being repeated by the chiefs of sections.

## TO CHANGE DIRECTION IN LINE.

## 25.

The battery being in line, to wheel it to the right, the orders are:

1. Battery—right wheel!
2. March!

The commands, "Right wheel—march!" 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 lieutenant commands, "Battery—halt—right—dress!" The commands, "Forward—

halt—right—dress!" are repeated by the chief of the right section, immediately after the lieutenant, 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 lieutenant commands, "Front!" The battery is wheeled to the left, according to the same principles, by inverse means.

#### TO CLOSE INTERVALS IN LINE.

##### 26.

When the battery is in line, to diminish its intervals the lieutenant 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 lieutenant, and repeated by the chiefs of sections.

When the intervals are to be closed toward one of the flanks, the lieutenant commands: "On right (or left) piece to—yards—close intervals—march!"

## TO RESUME INTERVALS.

## 27.

When the battery is in line, with diminished intervals, to cause the regular intervals to be resumed, the lieutenant 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 or left.

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

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

1. On right (or left) piece—full intervals!

2. March!

## PASSAGE OF OBSTACLES.

## 28.

When the battery is marching in line, to pass an obstacle which presents itself in front of one of the sections, the lieutenant 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. The passage of defiles is nothing more than the passage of obstacles, which requires the line to be broken into column of sections, by one of the manœuvres prescribed for passing from the order in line to the order in column. When it becomes necessary to break the sections, they should be formed again in succession by their chiefs, as soon as the nature of the ground will permit.

### FORMATIONS IN ACTION.

#### IN LINE, TO FORM IN ACTION TO THE FRONT

##### 29.

When the battery is in line, to bring it into action to the front, the orders are:

1. Fire to the front!
2. In action!

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

**IN LINE, TO FORM IN ACTION TO THE REAR.****30.**

When the battery is in line, to bring it into action to the rear, the lieutenant commands:

1. Fire to the rear!
2. In action!

At the command, "In Action!" repeated by the chiefs of sections, the crews go to their stations for action, as in Plate D.

**IN ACTION, TO FORM IN LINE TO THE FRONT.****31.**

Being in action to the front, to form in line to the front, the lieutenant commands:

1. Man the drags!
2. Pieces—right (or left) about!
3. March!
4. Halt!
5. Right (or left) dress!
6. Front!

If in action to the rear, the lieutenant commands:

1. Man the drags!
2. Right (or left) dress!
3. Front!

**IN ACTION, TO FORM IN LINE TO THE REAR.****32.**

Being in action to the front, to form in line to the rear, the lieutenant commands:

1. Man the drags!

2. Right (or left) dress !
3. Front !

If in action to the rear, the orders are :

1. Man the drags !
2. Pieces—right (or left) about !
3. March !
4. Halt !
5. Right (or left) dress !
6. Front !

#### IN COLUMN, TO FORM IN ACTION TO THE FRONT.

##### 33.

When the battery is in column, to bring it into action to the front, by gaining ground to the left, the lieutenant commands :

1. Fire to the front !
2. Forward into action—left oblique !
3. March !
4. Guide right !

As each section arrives upon the line, its chief brings it into action, by the commands, "Section—fire to the front—in action !" The formation to gain ground to the right is executed according to the same principles, by inverse means.

#### IN COLUMN, TO FORM IN ACTION TO THE REAR.

##### 34.

When the battery is in column, at a halt, to bring it into action to the rear, by gaining ground to the left, the orders are :

1. Fire to the rear !
2. Forward into action—left oblique !
3. March !
4. Guide right !

Executed as in the preceding manœuvre, except that the chiefs of sections command, "Fire to the rear—in action !" as their sections arrive upon the line.

#### IN COLUMN, TO FORM IN ACTION TO THE RIGHT OR LEFT.

##### 35.

When the battery is in column of sections, to bring it into action to the left, by gaining ground to the right, the commands are :

1. By section—right wheel !
2. March !
3. Fire to the rear—in action ! (Plate 11, Fig. 1.)

At the first command, the chiefs of sections command, "Section—right wheel !" and at the second, which they repeat, all the sections wheel together to the right, coming into action to the rear, upon the commands, "Fire to the rear—in action !" repeated by their chiefs. When the lieutenant wishes to form in battery to the left, by gaining ground to the left, he commands :

1. By section—left wheel !
2. March !
3. Fire to the front—in action !

At the first command, the chiefs of sections command, "Section—left wheel !" and at the second,

Fig. 1.

BY SECTION - RIGHT WHEEL - FIRE TO THE REAR - IN ACTION!

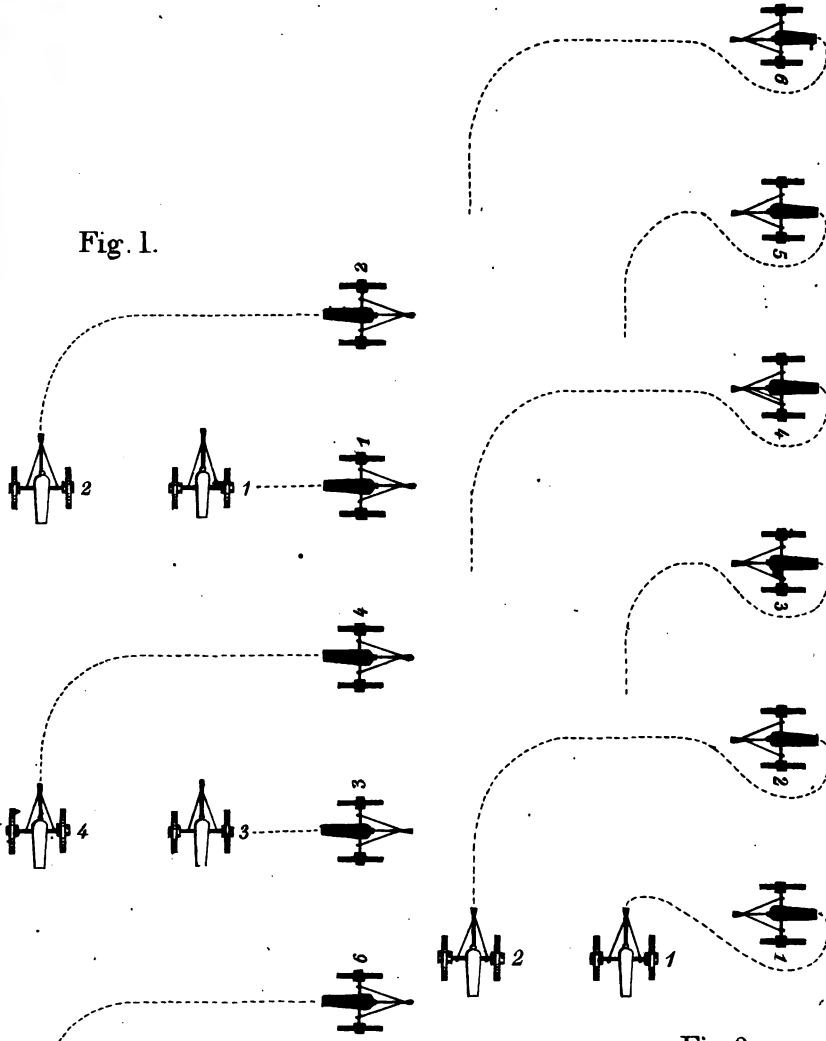
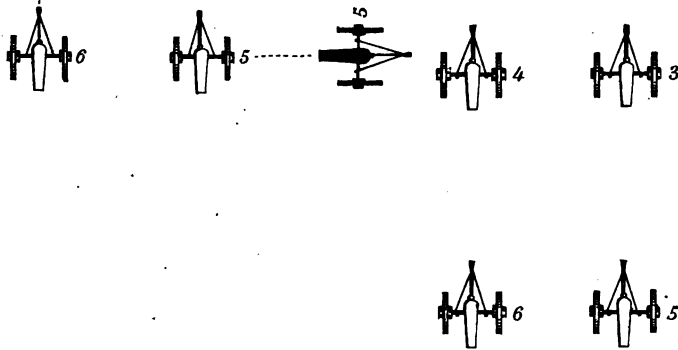


Fig. 2.

ON THE RIGHT INTO ACTION.





which they repeat, all the sections wheel at once to the left.

At the command, "Fire to the front—in action!" repeated by the chiefs of sections, all the sections form at once into action to the front. The two formations in action to the right, by gaining ground to the left or right, are executed according to the same principles, by inverse means.

#### IN COLUMN, TO FORM IN ACTION TO THE RIGHT OR LEFT.

##### 36.

When the battery is in column, to bring it into action on the right, the lieutenant commands:

1. On the right into action!
2. March!
3. Guide right! (Plate 11, Fig. 2.)

At the first command, the chief of the leading section commands, "Section—right wheel!" and upon 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—fire to the front—in action!" The other sections continue to advance, and as each arrives opposite its place in action, it is formed into action by its chief, as was the leading section.

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

**TO DEPLOY THE DOUBLE COLUMN INTO  
ACTION TO THE FRONT OR REAR.**

**37.**

The battery being in double column, to bring it into action to the front, the commands are :

1. Fire to the front !
2. Forward into action !
3. March !

Upon the commands, "Fire to the front—forward into action !" the chief of the leading section commands, "Section—halt !" the chief of the right section, "Section—right oblique !" the chief of the left section, "Section—left oblique !" At the command, "March !" repeated by these chiefs, the right and left 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 section, coming into action to the front, upon the order of the chiefs, "Fire to the front—in action !" If the lieutenant wishes to form in action to the rear, he commands :

1. Fire to the rear—in action !
2. March !

**TO DEPLOY THE DOUBLE COLUMN INTO  
ACTION TO THE RIGHT OR LEFT.**

**38.**

When the battery is in double column, to bring it into action to the right, the commands are :

1. To and on the right into action !



**2. March!**

Executed as in Article 19, except that the pieces are brought into action by the commands: "Fire to the front—in action!"

**TO PASS FROM THE ORDER IN ACTION TO THE ORDER IN COLUMN.****39.**

Being in action, to form column, the lieutenant first causes the line to be formed, as in Articles 31 and 32, and then forms column by one of the manœuvres for passing from the order in line to the order in column.

**TO MARCH BY A FLANK.****40.**

Being in action, to gain ground to the left, for the purpose of forming again into action, without an intermediate formation, the orders are:

1. Man the drags!
2. Pieces—right wheel!
3. March!

These commands are repeated by the chiefs of sections. At the command, "March!" the pieces wheel, as ordered, and move forward, until ordered into action again. The movement to gain ground to the right is executed according to the same principles, by inverse means.

## FIRINGS.

## 41.

When every thing is prepared for firing, the lieutenant commands, "Commence firing!" This command is repeated by the chiefs of sections, and the firing immediately commences. 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, "Commence firing!" is given by the lieutenant. 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 when the battery advances or retires by hand.

In no case should a piece be secured for the march, without discharging it, or withdrawing the charge.

To fire by battery, the lieutenant commands:

1. Fire by battery!
2. Battery—fire!

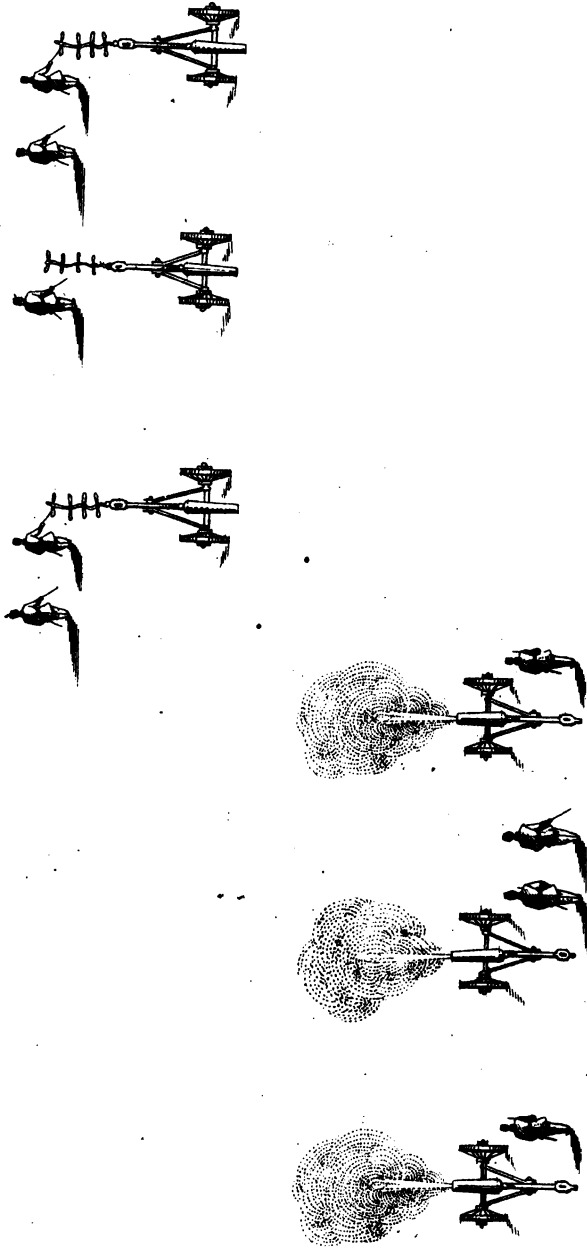
The first command is repeated by the chiefs of sections; the second is not repeated.

To fire by half battery, the commands are:

1. Fire by half battery!
2. Right (or left) half battery—fire!

To fire by section:

1. Fire by section!
2. Right (or left) section—fire!



FIRE ADVANCING BY HALF - BATTERY, RIGHT - HALF - BATTERY ADVANCE !



To fire by piece :

1. Fire by piece !
2. Right section—right or left piece—fire !

The chiefs of half batteries, or sections, repeat the first command, and immediately designate their respective commands, Right or left half battery—right or left section. They do not repeat the second command.

#### TO FIRE ADVANCING.

##### 42.

When the battery is firing, to commence the advance with the right half battery, the orders are :

1. Fire advancing—by half battery !
2. Right half battery—advance ! (Plate 12.)

At the second command, the chief of the right half battery discontinues firing, and commands, “Man the drags—pieces—right (or left) about—march—forward—guide——!” As soon as the right half battery reaches the new position, previously indicated by the lieutenant, its chief brings it into action by the commands : “Halt—fire to the front—in action !”

The fire of the left half battery is continued during the movement of the right.

As soon as the right half battery commences firing, the left moves forward ; and after passing the right half battery as far as the latter has advanced, is formed into action by the same commands.

The right half battery again advances as soon as the left commences firing, and the two continue to advance alternately until the lieutenant causes the firing

to cease. The battery is then aligned, or formed into line to the front, or rear, by the proper commands.

While advancing by half battery, the lieutenant places himself habitually with the most advanced portion of the battery, and is accompanied by the chief of the centre section. The movement may also be executed by sections; the sections advancing in succession, according to their positions in the battery.

### TO FIRE IN RETREAT.

#### 43.

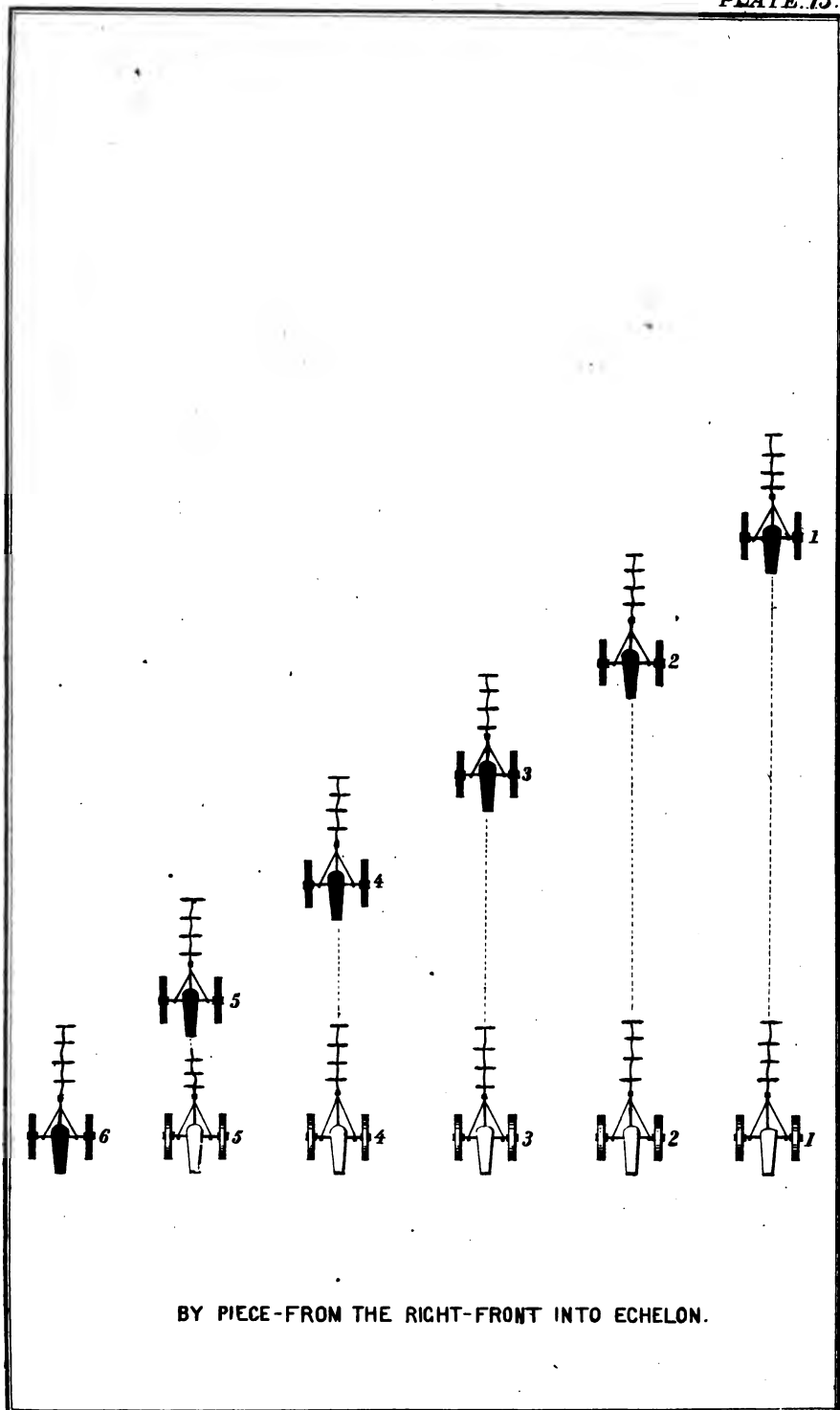
If it be desired to commence the retreat, with the right half battery, the orders are :

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, "Man the drags—forward—march—guide ——!" and conducts the half battery to the ground previously indicated by the lieutenant. As soon as the ground has been reached, the chief of half battery commands, "Fire to the rear—in action!" and commences firing.

As soon as the right half battery commences firing, the left retires; and after passing the right half battery as far as the latter has retired, is formed into action, and the firing again commences.

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



BY PIECE-FROM THE RIGHT-FRONT INTO ECHELON.





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

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

#### MOVEMENTS FOR FIRING IN ECHELON.

##### 44.

When the battery is in line, to advance in echelon of pieces, the orders are : †

1. By piece from the right—front into echelon!
2. March! (Plate 13.)

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 abreast of the wheels of the carriage on the right; and the other pieces commence the movement in succession, according to the same rule.

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

When the battery is in echelon, it may be formed into action to the front, rear, right, or left, by the command: "Fire to the front—(rear, right, or left)—in action!" If the pieces be in action, at the command, "Front—by hand—into echelon!" the pieces may be moved forward by hand, as in Plate E, and the fire reopened as each piece arrives in its position.

In echelon, each chief of section is with that piece of his command which is nearest to the enemy. (Plate 14.)

### BEING IN ECHELON, TO FORM LINE.

#### 45.

The battery being in echelon, to form it into line, the orders are:

1. On the right (or left) piece—forward into line!
2. March!

The commands are repeated by the chiefs of sections. Each piece moves forward, and establishes itself on the line, dressing on the piece indicated.

If the battery is in echelon and firing, to form it in the order in action, on the advanced piece continuing the fire, the lieutenant causes the pieces behind the line, on which the formation is to be made, to cease their fire, and (supposing the right to be in advance) commands:

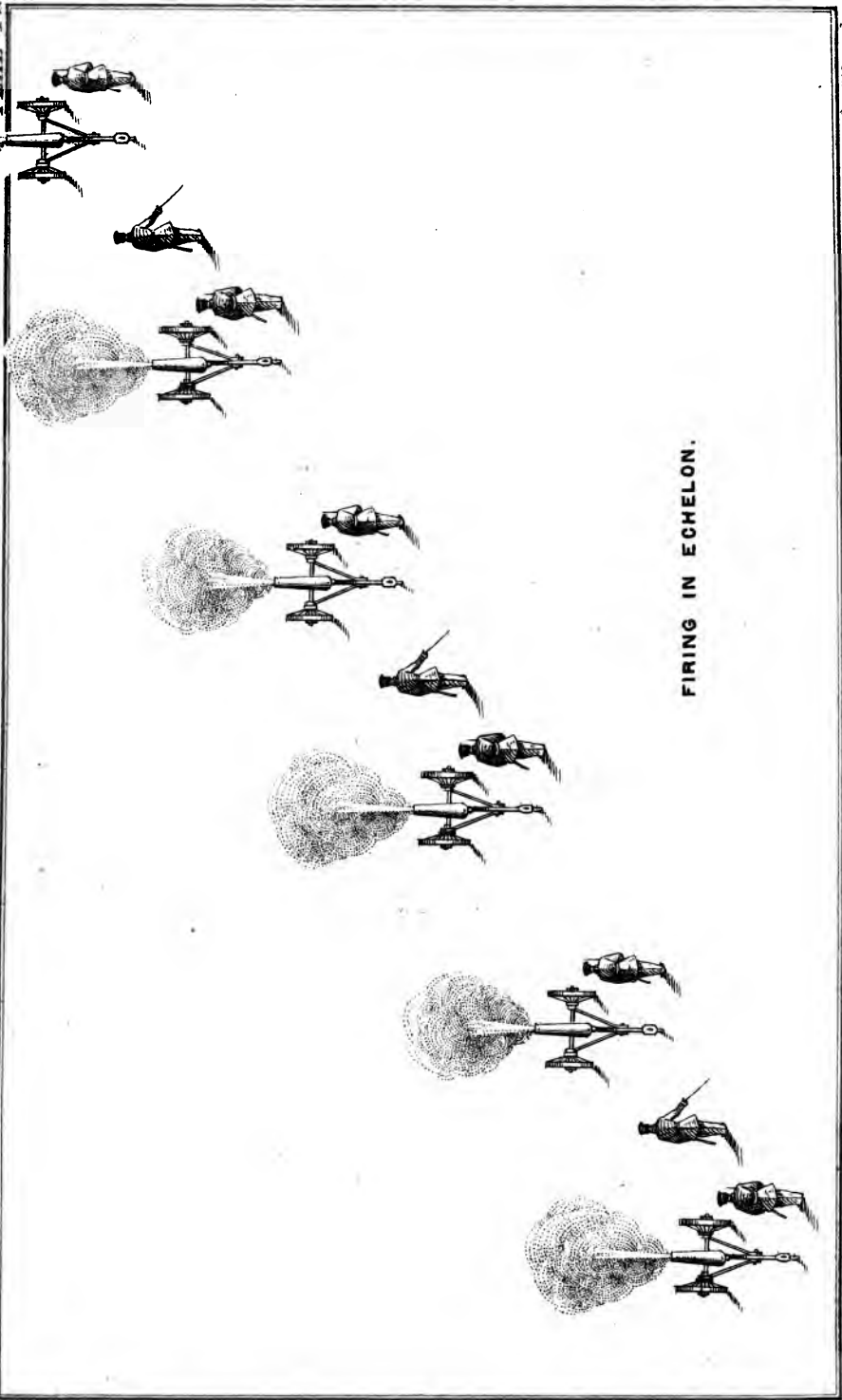
1. On the right piece—forward into action!
2. March!

At the first command, the chief of the right section gives the order: "Left piece—to the front—by hand!" The chiefs of the other sections command: "Man the drags—pieces—right (or left) about!"

At the command, "March!" the chief of the right section places his left piece on the line, the chiefs of the other sections execute the about, and then move forward, establishing their pieces in action, so soon as they arrive on the line, by the commands: "Fire to the front—in action!"

NAVAL HOWITZER ASHORE.

PLATE 14.

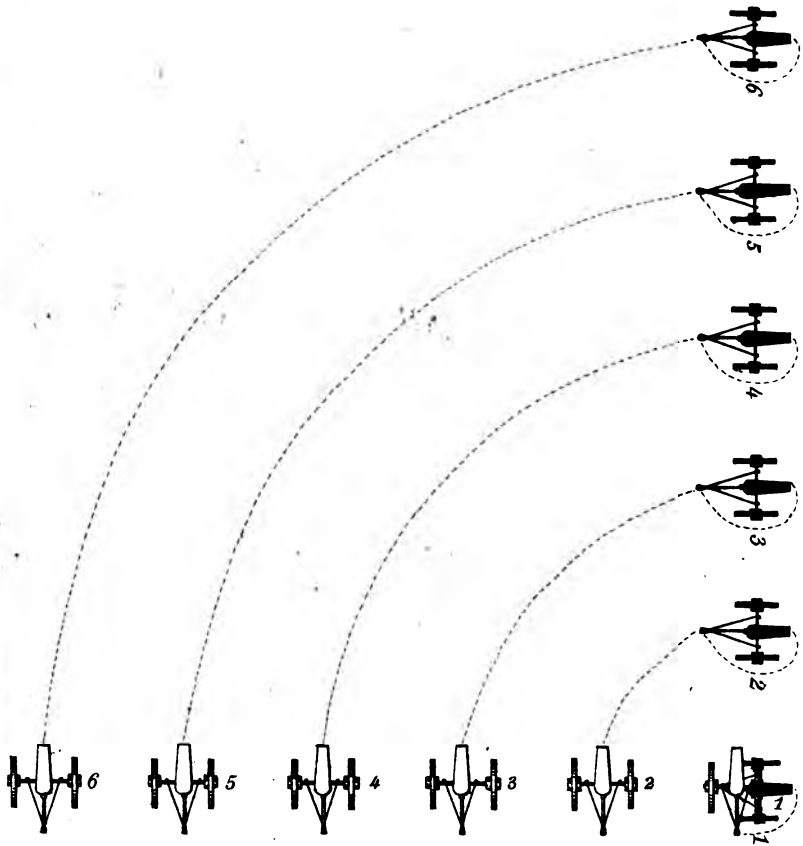


FIRING IN ECHELON.

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FIRE TO THE RIGHT - CHANGE FRONT FORWARD ON THE RIGHT PIECE.



**CHANGES OF FRONT IN BATTERY.****CHANGE OF FRONT TO FIRE TO THE RIGHT, LEFT WING, FORWARD, AND THE REVERSE.****46.**

When the battery is firing, if the lieutenant 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 the right!
2. Change front—forward on the right piece!
3. March! (Plate 15.)

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 section command: "Man the drags—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, "Fire to the front—in action!" 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, by inverse means. If the ground be good, this ma-

nœuvre may be executed by hand, by the commands :  
 "Fire to the right—by hand—change front forward  
 on the right piece!"

**CHANGE OF FRONT TO FIRE TO THE  
 LEFT, LEFT WING FORWARD, AND THE  
 REVERSE.**

47.

When the battery is firing, if the lieutenant 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 in Article 46, except that upon arriving upon the new line, the chiefs of sections command :  
 "Fire to the rear—in action!"

**CHANGE OF FRONT TO FIRE TO THE LEFT,  
 LEFT WING TO THE REAR, AND THE RE-  
 VERSE.**

48.

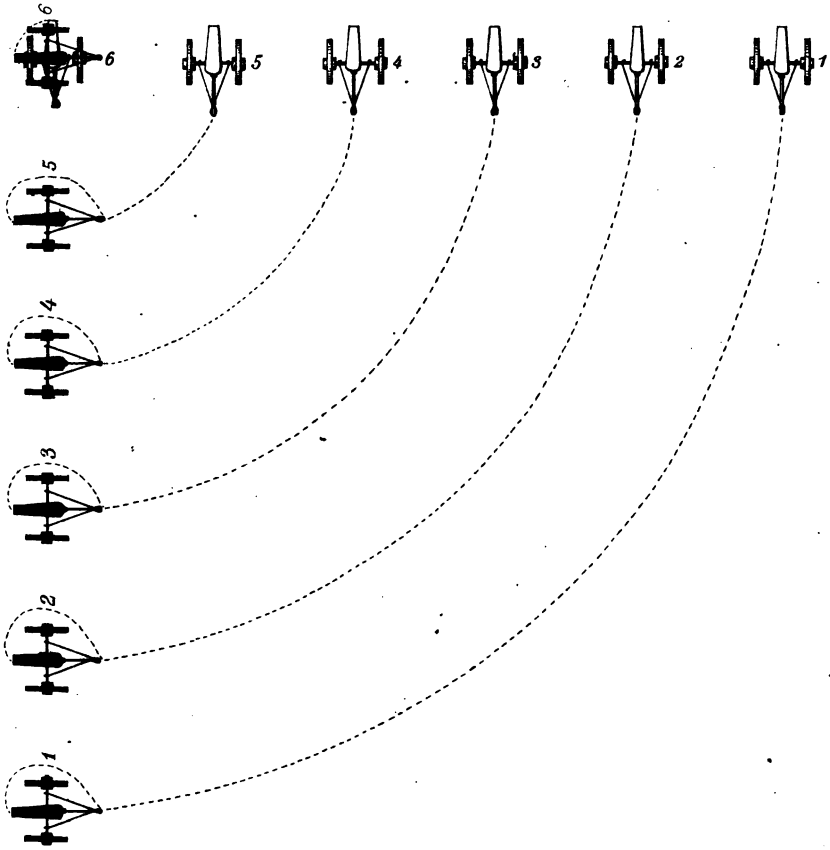
When the battery is firing, if the lieutenant wishes to make a perpendicular change of front to fire to the left, throwing the left wing to the rear, he causes the firing to cease, and commands :

1. Fire to the left!
2. Change front to the rear on the right piece!
3. March! (Plate 16.)

At the second command, the chief of the right section places the right piece in the new direction. He



FIRE TO THE LEFT - CHANGE FRONT TO THE REAR  
ON THE LEFT PIECE.





also causes the left piece of his section to be moved to the rear by hand, and established on the new line. The other chiefs of sections command: "Man the drags!" At the command, "March!" repeated by these chiefs, they command, "Forward—guide left!" and afterward in succession: "Section—left wheel—march—forward—fire to the rear—in action!" 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, by inverse means.

#### CHANGE OF FRONT TO FIRE TO THE RIGHT, LEFT WING TO THE REAR, AND THE RE- VERSE.

##### 49.

When the battery is firing, if the lieutenant 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 in Article 48, except that upon arriving upon the new line the chief of the right section commands, "Fire to the rear!" while the chiefs of the centre and left sections command: "Fire to the front—in action!"

## TO FIRE TO THE FRONT, RIGHT AND LEFT.

## 50.

When the battery is firing, if the lieutenant 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 !

At the second command, the chief of the right section orders : “ Right piece—fire to the right—left piece front by hand into echelon !”

The chief of the left section, “ Left piece—fire to the left—right piece by hand front into echelon !” the chief of the centre section : “ Section—to the front by hand !” Upon the command, “ March !” the pieces ordered into echelon move to the positions indicated by their chiefs, and are brought into action by the orders, “ Fire to the right—fire to the left !” while the centre section is moved forward to its place by hand, and brought into action by the command : “ Halt—commence firing !”

Should the nature of the ground, or circumstances preclude an advance movement, the manœuvre can be accomplished by a retrograde, the lieutenant 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 REST.

## 51.

When the lieutenant wishes the men to stand at ease, but to remain at their stations at the drag-rope, he commands: "Rest!"

If he wishes to allow the men to leave the drag-rope, to lie upon the ground, he commands: "At will—rest!" In both cases the crews will resume their stations at the command: "Attention!"

TABLE OF RANGES FOR HOWITZERS.

CLASS OF GUN.	KIND OF PROJECTILE.	ELEVATION IN DEGREES. RANGE IN YARDS. TIME OF FLIGHT IN SECONDS.								
		0°	1°	2°	3°	4°	5°	6°	7°	
24-Pounder, smooth bore.....	Shrapnel....	255	555	790	960	1140	1308			
	Shell.....	.96	1.92	2.87	3.80	4.75	5.70			
	Shell.....	.90	1.8	2.75	3.65	4.63	5.68			
12-Pounder, smooth bore, heavy..	Shrapnel....	250	500	700	870	1015	1150			
	Shell.....	1.0	1.9	2.8	3.7	4.6	5.4			
	Shell.....	1.0	1.65	2.35	3.1	3.9	4.6			
30-Pounder, Dahlgren Rifle.....	Shell.....	370	815	1155	1440	1715	1960	2200	2435	
	Shell.....	1.4	2.4	3.4	4.5	5.5	6.5	7.5	8.6	
12-Pounder, Dahlgren Rifle.....	Shell.....	360	750	1050	1305	1550	1770	1985	2210	
	Shell.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	

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