

EXTRACTS FROM THE MANUAL OF SIGNALS.

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# SIGNAL SERVICE DRILLS,

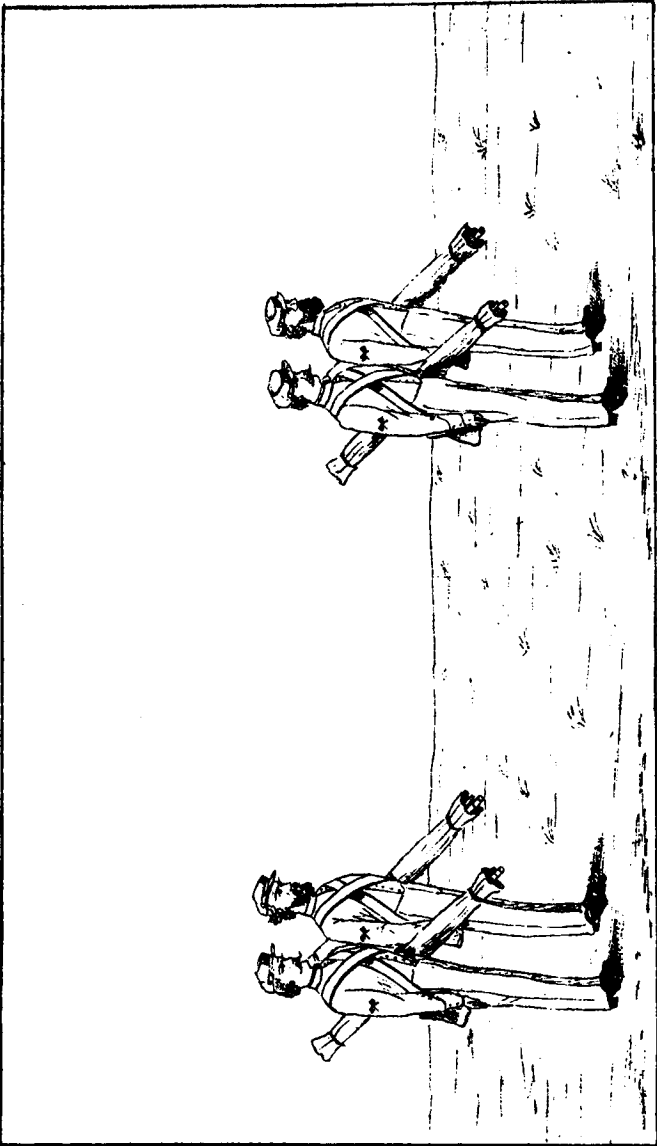
PREPARED UNDER THE DIRECTION OF

BVT. BRIG. GEN. ALBERT J. MYER,

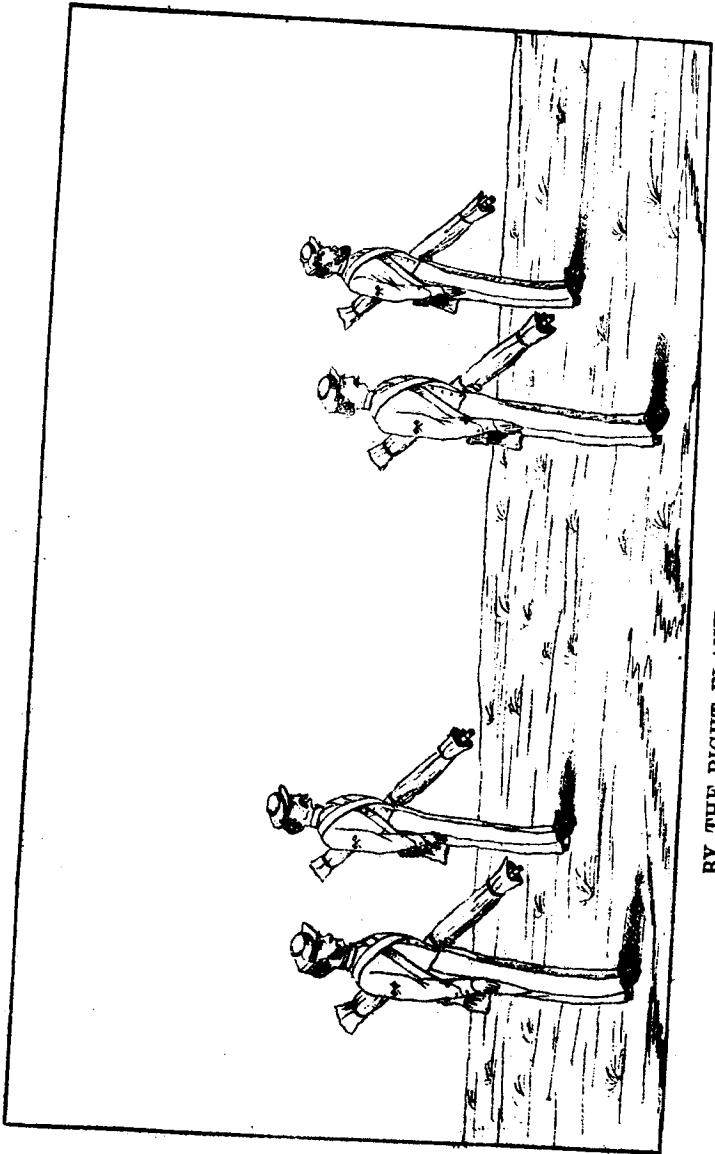
CHIEF SIGNAL OFFICER OF THE ARMY.



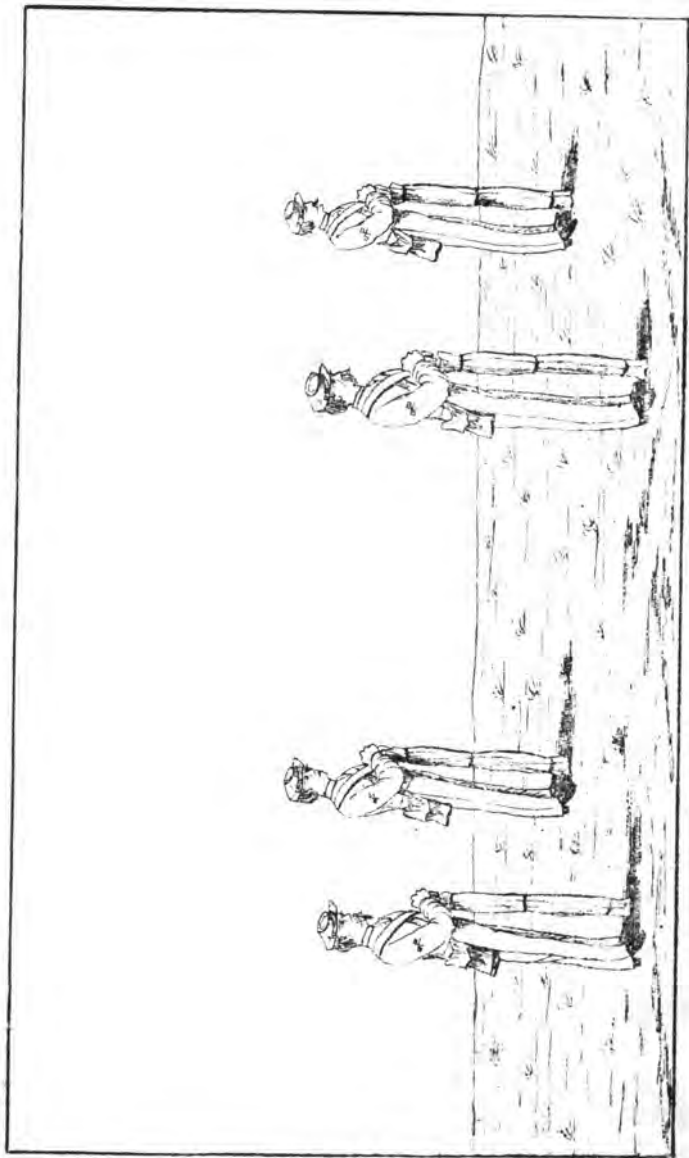
WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1870.



REAR OPEN ORDER.



BY THE RIGHT FLANK 2 PACES TAKE INTERVALS.



**INSPECTION OF EQUIPMENTS. ORDER—KITS.**

## SIGNAL SERVICE DRILLS.

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### INSPECTION OF SIGNAL EQUIPMENTS.

#### SERVICE SET.

The inspection of equipments is always necessary when a detachment is about to take, or is serving in the field, and must be had in every case before a signal-man is put upon a station. The form given applies equally to the inspection of equipments of a single man or of a detachment.

The party being on the inspection-ground in two ranks, with full equipments, kit at a "carry," haversack on the right side, and the canteen on the left side, the first command will be,

1. "Prepare for inspection."
2. "Rear, open order."
3. "March."

At the command "March," the rear rank will move four paces to the rear, aligning to the right without further command. The officer in charge will then cause intervals of two paces to be taken to the right. Upon coming to a front, each rank will be dressed to the left. The command will then be,

"Order, kits;"

which being executed, the inspector will then pass down both ranks, and closely inspect the general appearance of the men, their kits, clothing, and bearing. As soon as

this inspection is finished, the inspector will command,

1. "Attention,"
2. "Carry kits;"

which being executed, he will command,

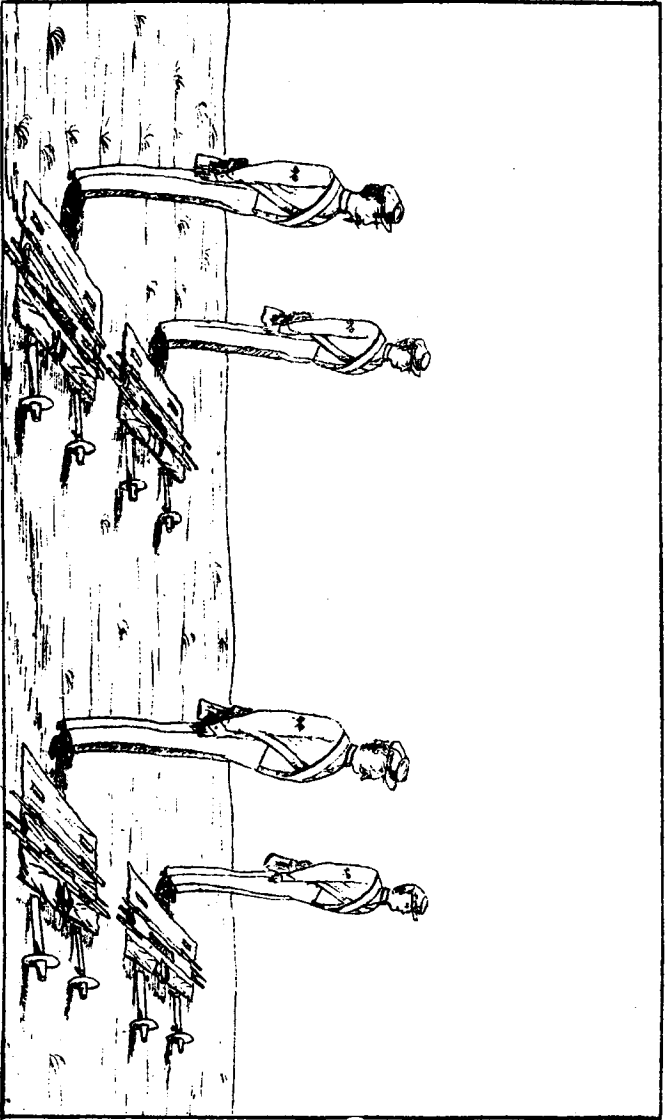
"Unpack kits."

At this command the kits will be placed upon the ground in a line parallel to the rank, and twelve inches from the feet of the bearers. Each man then stooping over, will unstrap and open his kit, take out the torches, putting a flame-shade and extinguisher on each, and place them in front of their respective pouches, and perpendicular to the line of kits, and then resume the position of "Attention;" the kits to be opened with the butts of staff to the left.

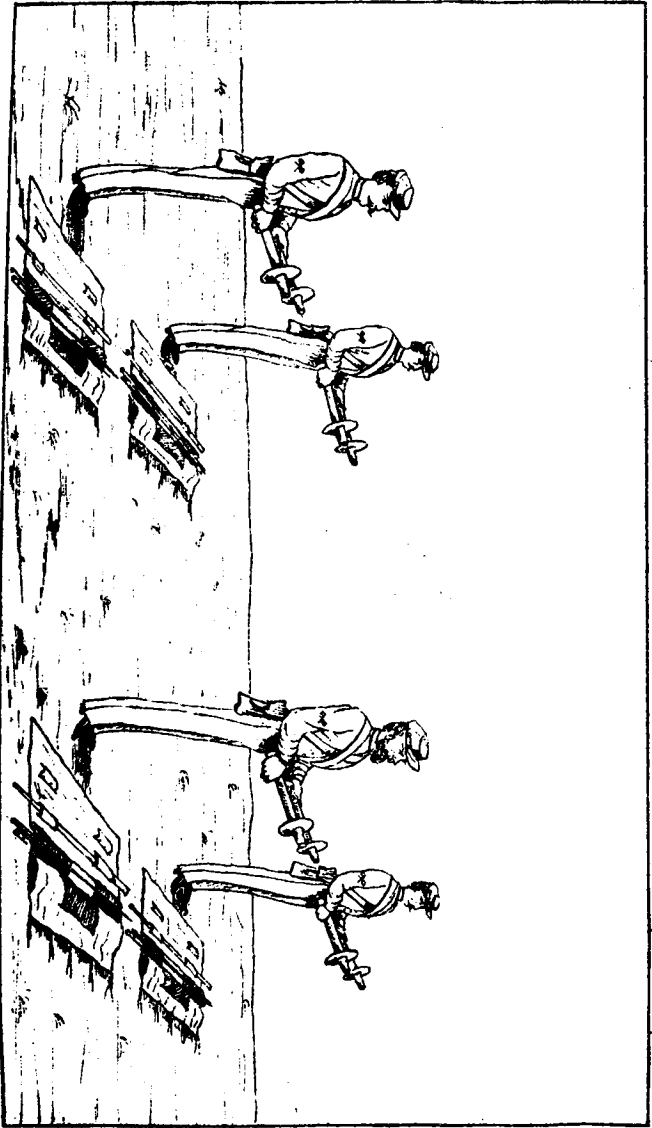
At the command,

"Flags and torches,"

the flags will be neatly folded in two (2) folds, and laid upon the kit, with the ties to the front. The white flag will be laid upon the torch-case with its red centre uppermost, and the red flag folded in the same manner and laid immediately in rear of the white flag; and this completed, each man will resume the position of "Attention," with a torch in each hand, and will present them in turn to the inspector as he approaches, who will closely examine each as to the fit of the flame-shade, and noticing particularly the condition of the thimbles and screws, and the wedge strips. The shades may be tightened by bending the cylindrical part before putting them on the torches, or by pressing the shades firmly upon the wedge strips. When screw-caps leak, they should be fitted with packing of a circular piece of cork, leather, or india-rubber, cut to fit the interior of the caps. Each man as the inspector passes

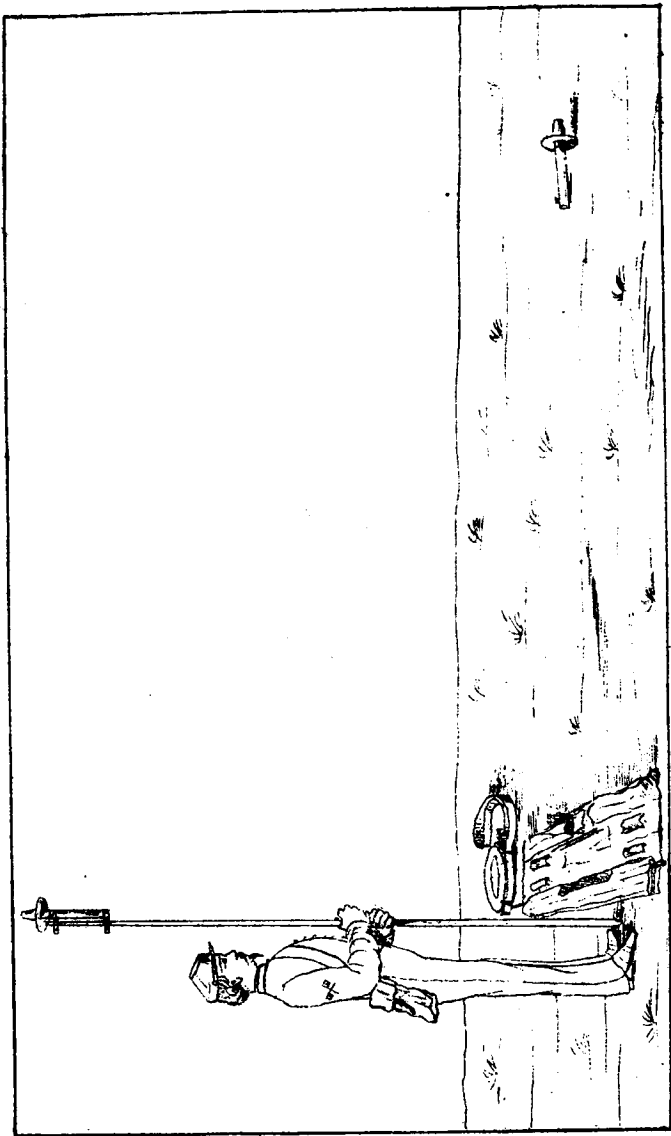


UNPACK-KITTS.

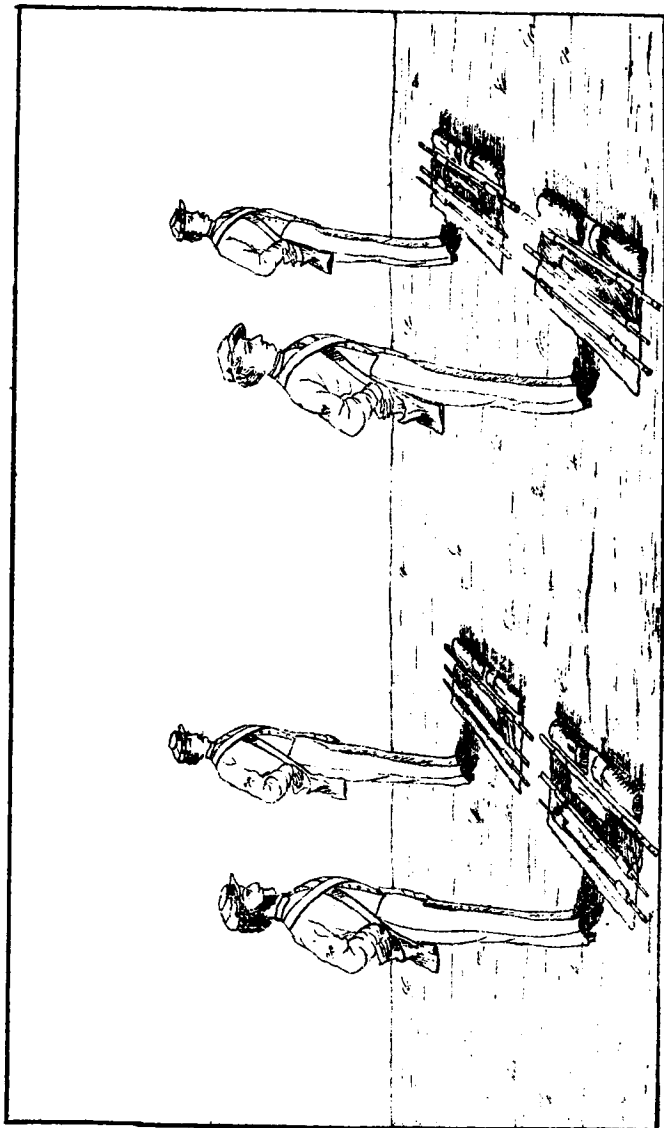


FLAGS AND TORCHES.

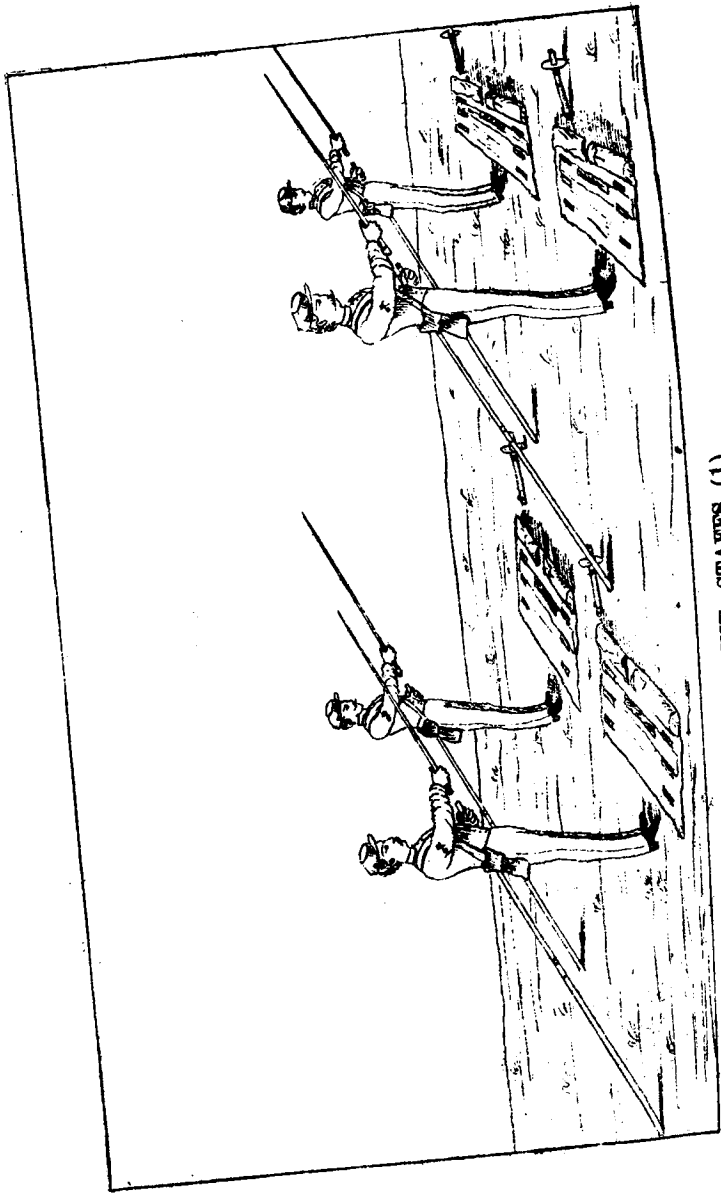




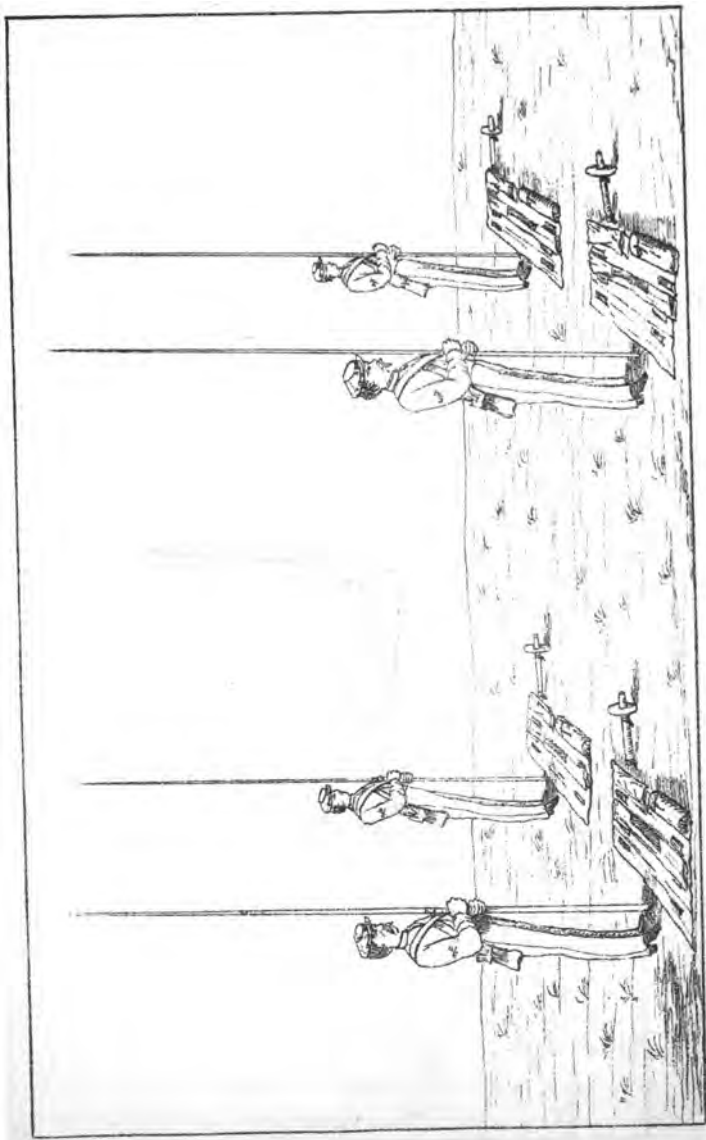
ATTACH—TORCHES.



OPEN—HAVERSACKS.



JOINT-STAFFS. (1)



JOINT-STAFFS. (2)

the file, will place the flying-torch on the ground in front of its pouch, return the flame-shade of the foot-torch to the haversack, and replace the torch in its pouch, fold up the flags and put them in their places, and resume the position of "Attention."

This inspection over, the command will be,

1. "Join staffs."

At this command, each man will join his staff together as prescribed in the "Form of Flag Drill," and will, when the staff is joined, take the position of rest and fix his attention.

When the inspector reaches him, each man will present his staff to him with the right hand. The inspector will examine to see if the joints fit perfectly, and if the staff be clean and in good order. This inspection over, the command will be,

1. "Attach torches."

At this command the third joint of staff will be removed and the flying-torch attached, as prescribed in the "Form of Torch Drill." The inspector will then examine each man's torch in detail, receiving it from the right hand of the flagman. Each man, as soon as the file on his left is inspected, will detach his torch, remove the flame-shade and put it in the haversack, return the torch to his pouch, unjoint his staff and put the joints in their beackets. This inspection finished, the next command will be,

1. "Open haversacks."

At this command the haversacks will be held open by each man with his right hand. The inspector passing in rear of each rank, will inspect for proper number and condition of articles in haversacks, and also inspect at the same time the canteens, particularly noticing condition of the screw-caps. Each haversack will be closed as soon as

the inspector passes. The inspection finished, the command will be,

1. "Repack kits,"

when each man will close his kit and take the position of "Order kits," standing at ease. The next command will be,

1. "Attention,"
2. "Carry kits."

When this is done, intervals will be closed to the left, and the inspector will command,

1. "Close order,"
2. "March,"

when the rear rank will close to thirty-six (36) inches.

Inspection with the carbine will be as prescribed by the authorized Cavalry Tactics.

If drill follows inspection, intervals will be extended by the command,

1. "By the right (or left) flank."
2. "To three (six or nine) paces, extend intervals."
3. "March."

Intervals will be closed in the same manner as described in the "Manual of Flag and Torch Drill."

## INSTRUCTION AND PRACTICE DRILLS.

The drills in the Manual of the Flag and Torch are to insure skill, promptness, and similarity of order and execution, by practice under the immediate supervision of the instructor, and to insure the permanent recollection of the codes. In the drills with the flag the instructor should take especial care that the motions are made without entangling the flag (a tangled flag becomes invisible at short distances). For this purpose the staff should be so handled that an arc of, say, six inches is described by the tip at each end of the swing or motion. This handling keeps the flag clear of the staff, and always behind it as relates to the motion. Care must be taken that the arcs are so described that the flag will not wind upon the staff. In all movements of the flag or torch, time of movement will be taken from the sergeant in front, or, in his absence, the right-hand file. In all movements from a front position to any other position during a drill, the flagman will come to a "right about" as he leaves any position, and to the "left about" as he takes position. The Manual comprehends a description of the acts and motions required to be ordered to a signalman going upon a station, "On post," and for the purpose of transmitting messages, together with the forms of orders to be given. The orders are those used in every case in opening a station, working it, and preparing to leave it. The manuals apply to the drill of a class or of a single man. On ship-board the drills can be had with squads of two or four, posted on opposite sides of the deck.

The drills must be had daily until they are thoroughly acquired, and thereafter with such frequency as to render it impossible for either the Alphabetic or Letter Motions to escape the memory of officers or enlisted men. The Chiefs of Signal Parties supervise the drill, and insist on their accuracy. At military posts, or on shipboard, in cases where the use of signals may be incidental only, but where small parties have been instructed and equipped, a thorough drill in the manual of both flag and torch must be had at least once in each week. The time can be easily spared, and the commander can be thus assured that both officers and enlisted men, once taught, are practiced and ready for instant service.

The class will be habitually paraded in two ranks at all formations, the distance between ranks being thirty-six (36) inches. It will be manoeuvred, so far as is practicable, by the system of tactics prescribed for cavalry.

When the class is sufficiently large to require the attendance of several instructors, it will be divided into squads, each in charge of a separate instructor. Classes will be paraded for instruction with kits at a "Carry."

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### MANUAL OF THE KIT.

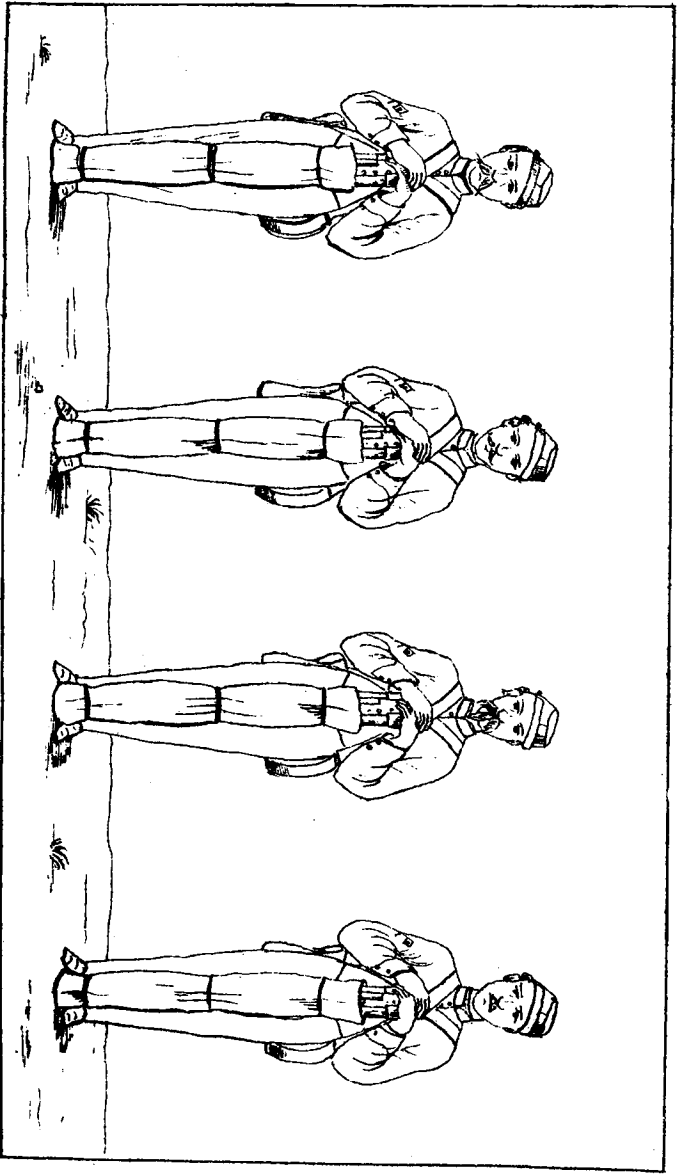
The kit straps are known as the upper, middle, and lower straps; the upper is that nearest the tip of staff. All movements of the kit are to or from the "Carry," as a standard position.

The position of "Carry kits" is the kit carried obliquely under the left arm, the left hand grasping it at the middle strap, the butt of the staff to the rear, the tip inclining toward the ground in front.

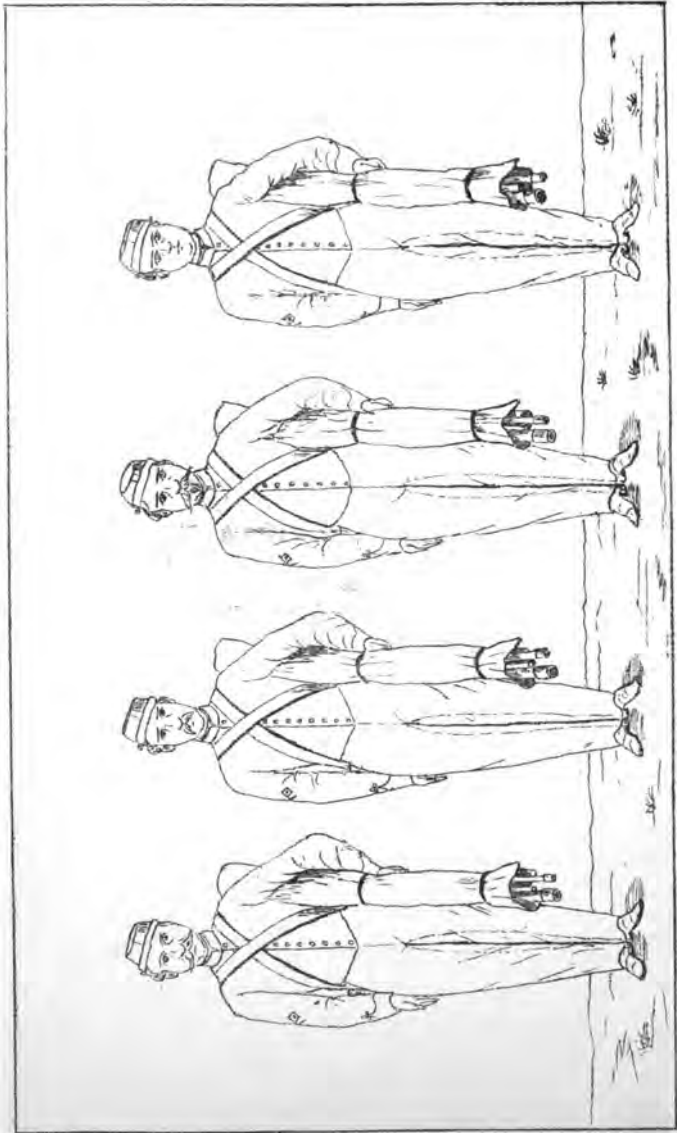
At the command,

"Order—kits,"

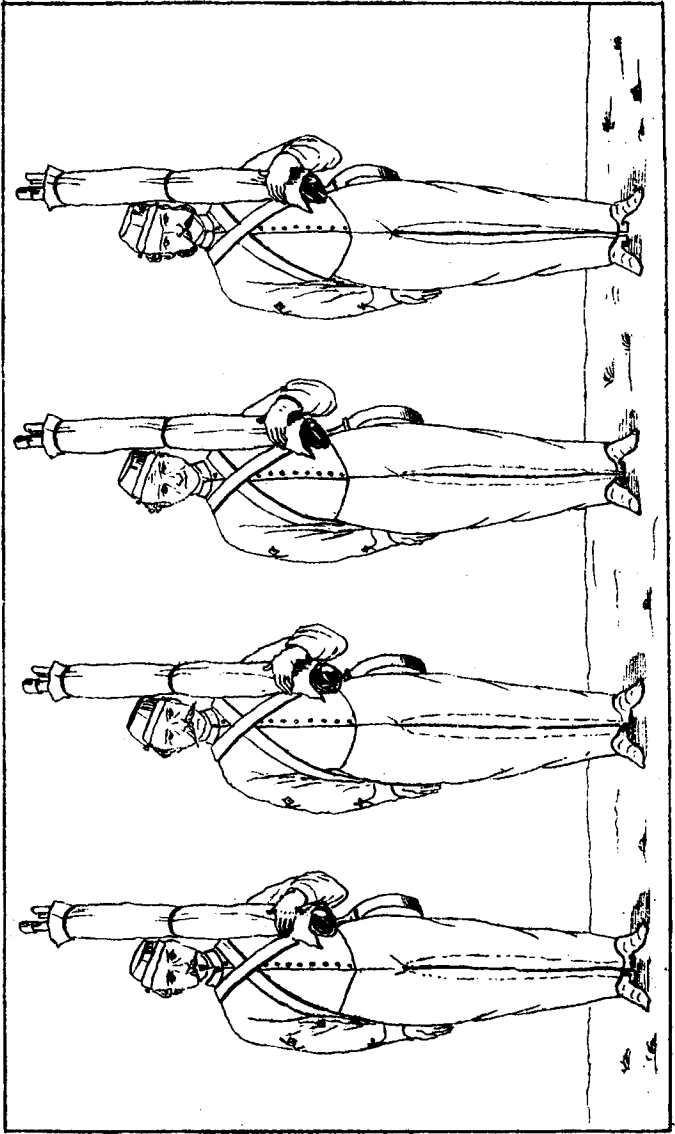




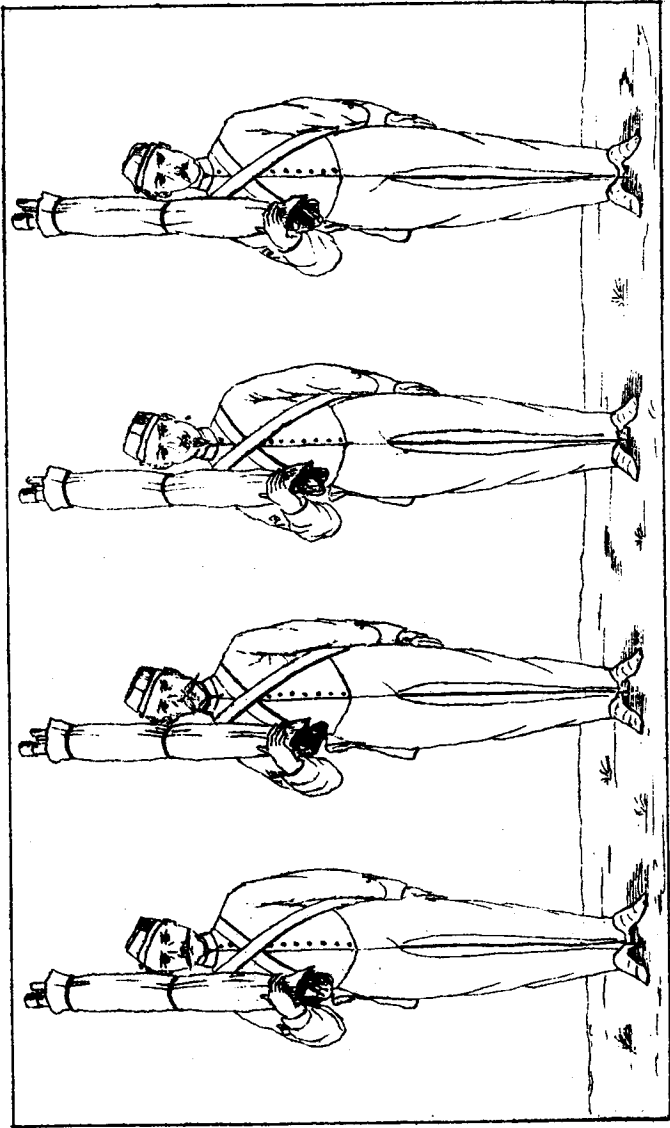
ORDER—KITS.



CARRY—KITS.



SHOULDER-KITS.



**RIGHT SHOULDER-SHIFT--KITS.**

change the position of the kit with the left hand, assisted by the right at the upper strap, so as to bring it in front of the center of the body in a vertical position, butt down, right hand at the height of the eye, and drop it between the feet, placing both hands on the top of the kit, right hand above the left.

At the command,

“ Carry—kits,”

seize the kit with the right hand, fingers to the front, at the upper strap ; raise it until the right hand is at the height of the eye, grasp it at the middle strap with the left hand, and assisted by the right hand, bring it under the left arm, butt to the rear, inclining the kit toward the ground in front ; drop right hand by the side.

“ Shoulder—kits.”

Raise the kit by the left hand to a vertical position on the left side, hand at the height of the shoulder, and butt of staff down, seizing it at the same time with the right hand at the lower strap ; place it on the left shoulder, with middle strap just back of the shoulder ; move the left hand to the lower strap, and drop the right hand by the side.

The kit being at a “ Shoulder,” at the command,

“ Carry—kits,”

seize the kit at the lower strap with the right hand, move the left to the middle strap, and bring the kit under the left arm, inclining it toward the ground in front, butt of staff to the rear. At the same time drop the right hand by the side.

The kit being at a “ Shoulder,” at the command,

“ Right shoulder shift—kits,”

the kit is brought to a vertical position at the left side by the left hand at the height of the hip, and at the same time grasped at the centre strap by the right hand—the

hand being at about the height of the shoulder. It is then carried across the body by both hands, and placed upon the right shoulder. The right hand is brought to the lower strap, and the left hand dropped to the side.

Kits being at "Right shoulder shift," to come to a "Carry," bring the kit to a vertical position at the right side with the right hand, lowering the hand to about the height of the hip, grasping the kit at the same time at the center strap with the left hand; carry the kit across the body with both hands, bring the butt under the left arm with the right hand, let the kit turn easily in the left hand, dropping the right hand to the side, and assuming the position of "Carry kits."

The kits being at a "Carry," at the command,

"Kits—port,"

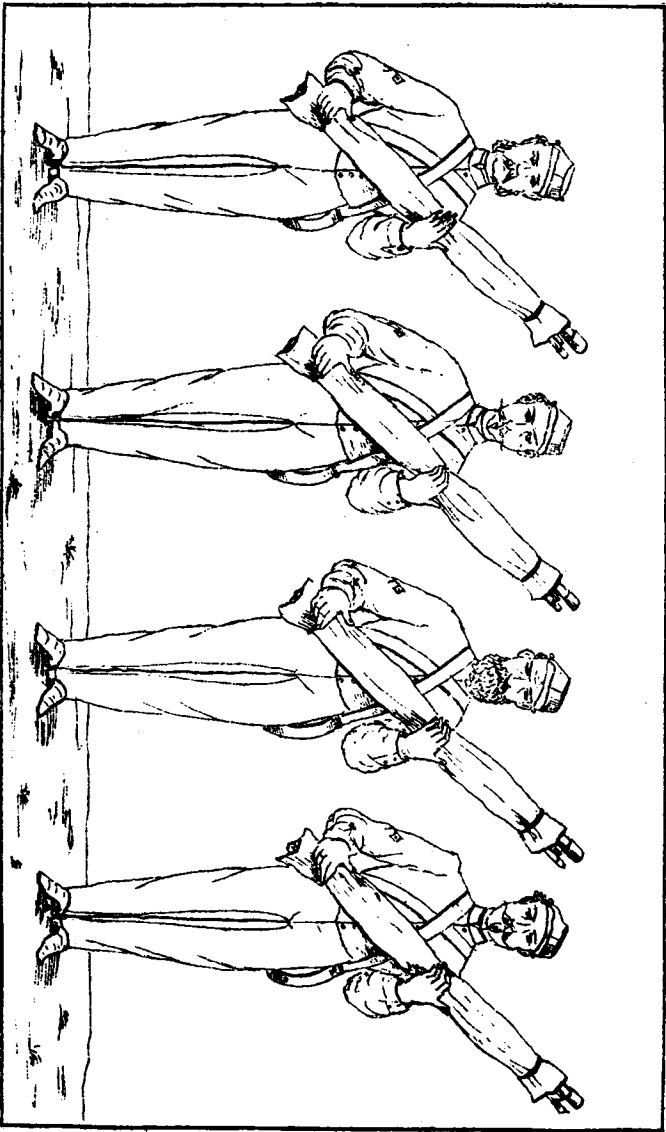
raise the kit with the left hand to a vertical position on the left side, hand at the height of the shoulder, butt of staff down; grasp the kit with the right hand at the middle strap, change the left hand to the lower strap, incline the kit to the right with the right hand in front of the right shoulder.

To resume the position "Carry," bring the kit to a vertical position on the left side, with the right hand at the height of the shoulder; seize it at the middle strap with the left hand, and bring it under the left arm, dropping the right hand at the side.

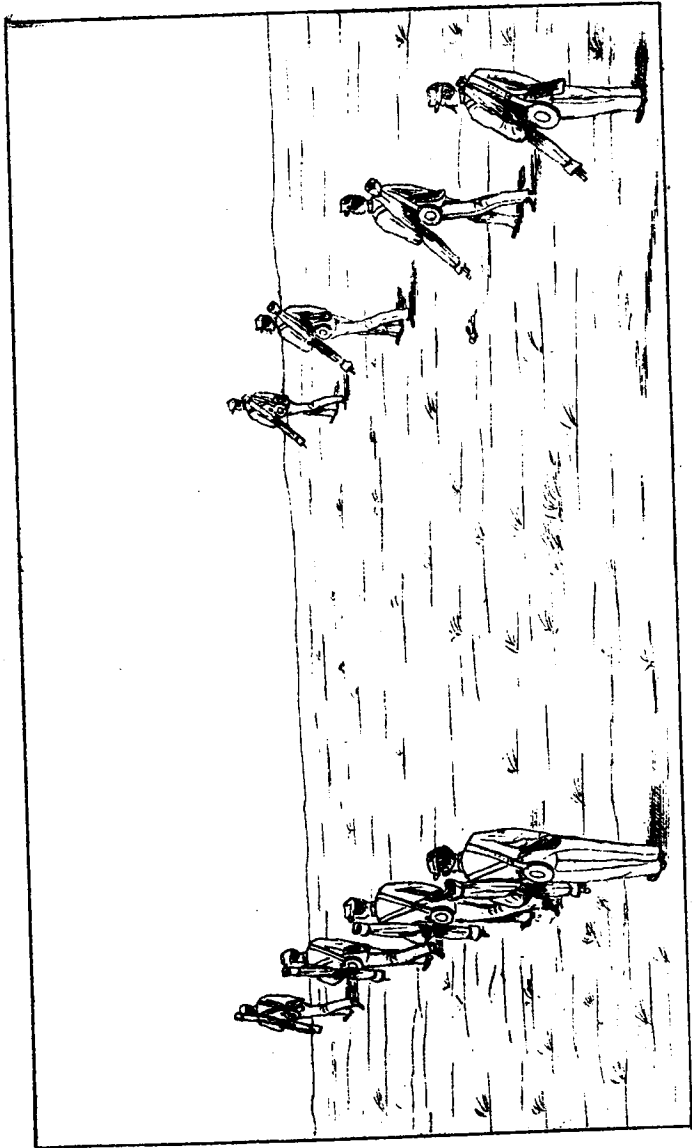
When, at the position "Order kits," the instructor wishes to give repose, he will command,

"Rest,"

when silence and steadiness need not be preserved. The position "Order kits" will be resumed at the command "Attention."



KITS—PORT.



BY THE LEFT FLANK 6 PACES TAKE INTERVALS.



At the command,  
 "Stand at kits,"

the flagman, moving from whatever place he may be, will take position twelve (12) inches in rear of kit. This command applies only when the kit has been unstrapped, opened, and placed.

When a detachment or squad without officers is marching with kits at a "Carry," the non-commissioned officer or soldier in charge, will, on approaching an officer, notice his position, and command "Eyes right," or "left" (as the case may require), and will salute himself by bringing his right hand to his cap in the usual manner.

A detachment or squad marching with kits at a "Shoulder" will always come to a "Carry" as a salute, before passing a commissioned officer, the non-commissioned officer giving the commands and saluting as above described. A soldier with kit passing an officer will pass with the kit at a "Carry," looking respectfully at the officer, and saluting with the right hand at the cap.

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## MANUAL OF THE FLAG AND TORCH.

### FLAG DRILL.

For instruction in the manual of the flag, the class will be formed in one rank on the instruction-ground, faced to the front, and halted. Intervals will then be taken by the command,

1. "By the right (or left) flank."
2. "At six (or nine) paces, take intervals."
3. "March."

If by the right flank, at the second command, the class will face to the right. At the third command the right file will step off in the prolongation of the former front of

the class ; the other men will follow successively at the distance of six or nine paces. When the left man has his proper distance, the instructor will command,

1. "Detachment, halt."
2. "Front."

At the second command, the detachment will face to the front and align itself upon the stationary flank without further commands, and the first sergeant will move eight (8) paces in front of the centre of the detachment, and will constitute the guide by whom the time of the different movements will be regulated.

When the drill is with two joints of staff, the interval will be six paces; if with three joints, nine paces. This rule is general.

To close intervals, the command will be,

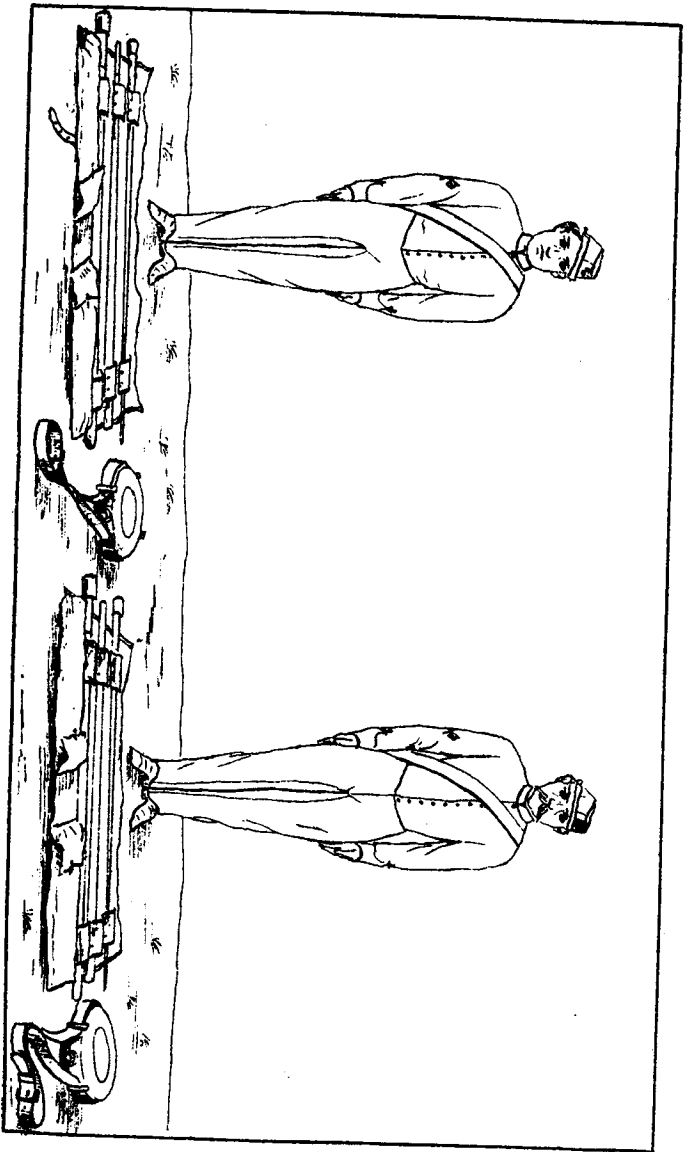
1. "By the left (or right) flank."
2. "Close intervals."
3. "March."

At the second command, if the intervals are closed to the left, the left file will stand fast, all others will face to the left; at the third command, each man will close to the left, and as each successively reaches his proper place, he will halt, and face to the front. If intervals are closed to the right, the right file will stand fast, and all others will face to the right.

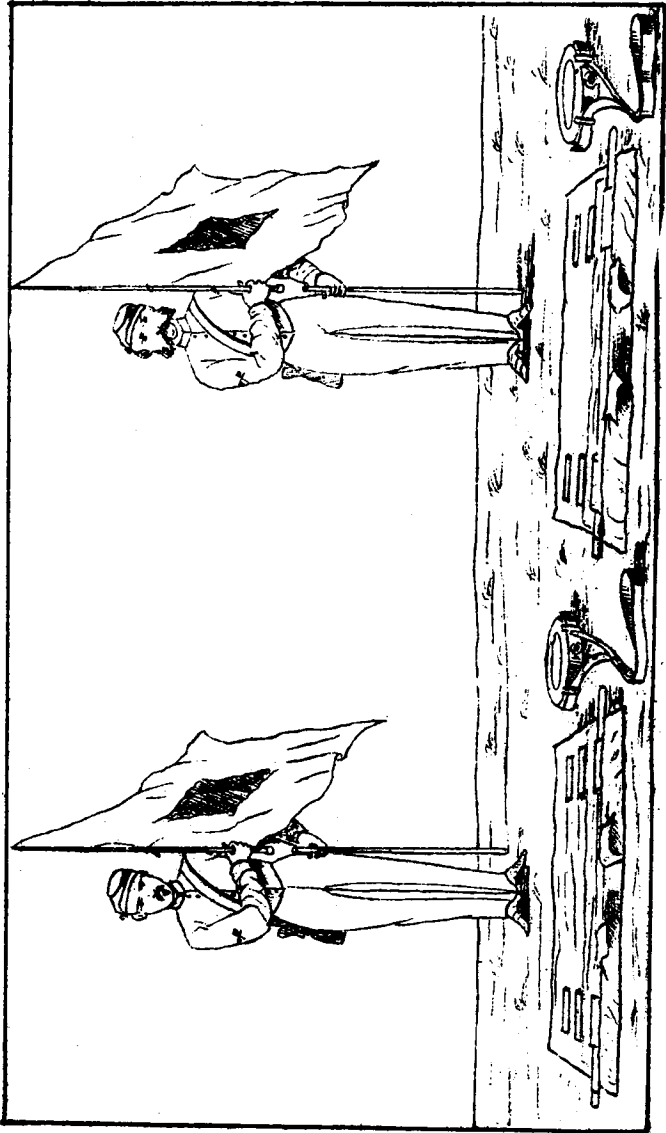
The class being on the drill-ground, and intervals taken, the command will be,

"Unstrap kits."

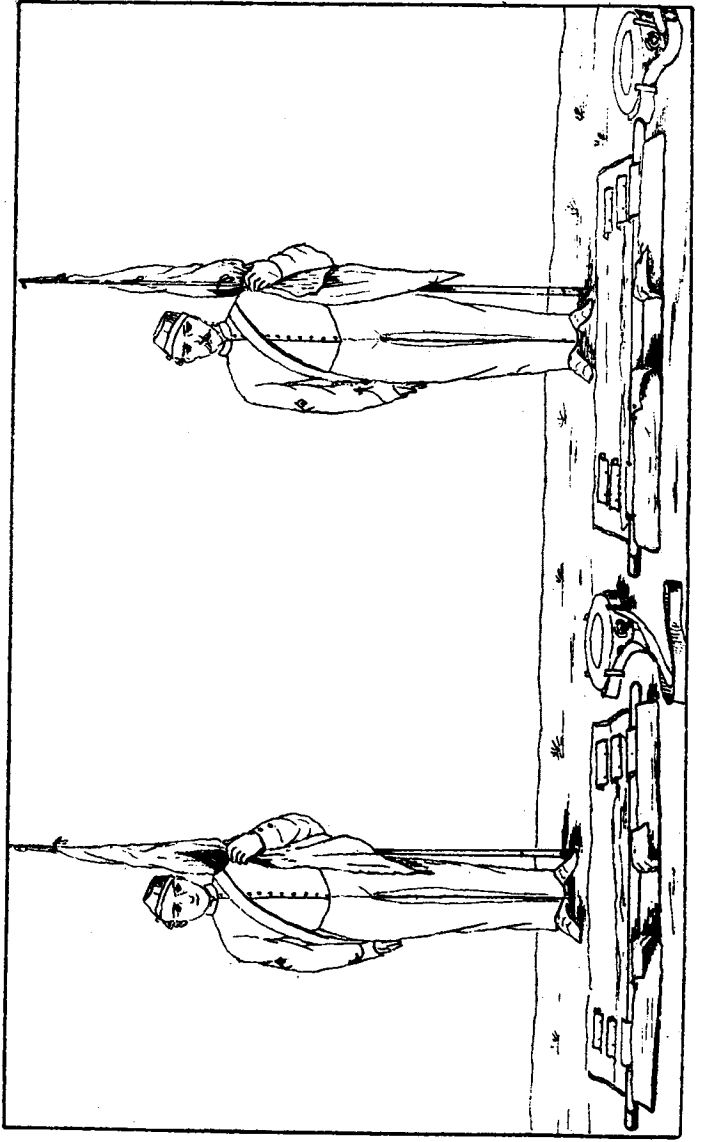
At this command the kits will be placed upon the ground in a line parallel to the rank and twelve inches from the feet of the bearers, butts of staff to the left. The canteens will be unslung and laid on the ground at the left of the kit, not touching it. Each man then stooping over will



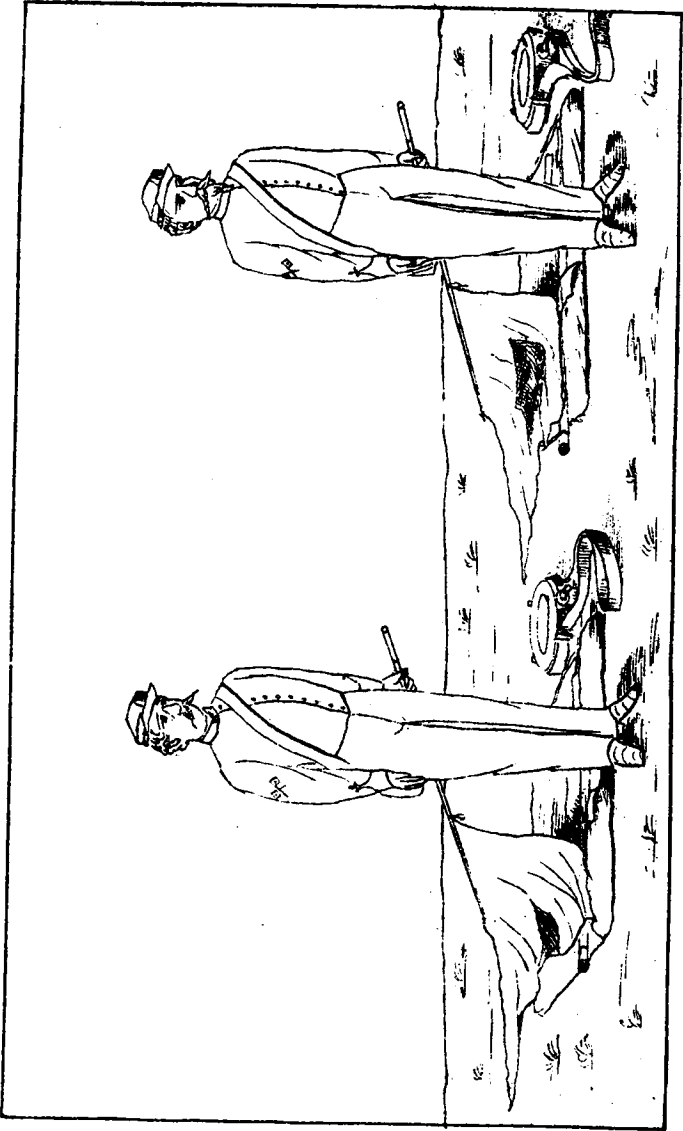
UNSTRAP-KITS.



ATTACH—FLAGS.



ATTACH—FLAGS. (2)



POST.

unstrap and open his kit, and then resume the position of "Attention;" if the drill is to be with flags, the instructor will then command,

"Attach flags."

At this command the lower joint of staff to be used will be taken from the kit with the left hand and passed to the left of the body, the butt resting on the ground, the left hand near the top; the second joint will then be taken out with the right near its base and connected with the first joint. The same process is repeated for the third and fourth joints when they are used. The butt of the staff is then thrown more to the rear, so that the flag may be easily attached.

To insure uniformity of time, each man, after attaching the flag, holds the staff vertically, butt on the ground on the left side, and close to middle of left foot, with the left hand at the height of the breast (and grasping flag, if but two (2) joints are used) until the command,

"Down,"

when all the staffs will be dropped together, and directly to the rear of the rank, by a single motion of the left hand and arm—the arm being extended directly back, with hand at height of hip, and grasp then loosened. The station is now arranged as it would be in the field before commencing work.

The instructor will then command,

"Post,"

when the flagman grasps the staff eighteen inches from its butt with the left hand, and raising it to the height of his waist, takes position two paces in front of his kit. This will be the habitual position of a flagman when "On post."

If, after the flags are attached, the instructor wishes to commence signalling without putting the flags "Down," he will, instead of "Down," command "Post," when the

flags will be dropped to the rear, and the position of the left hand changed with the assistance of the right, so as to grasp the staff eighteen inches from the butt. The flagman will then take position two (2) paces in front of his kit.

At the command,

“Ready,”

which is a command of preparation, the flagman being in the position of “Post,” will grasp the butt of the staff with the right hand, the thumb toward the body, nails down, stand erect, and be in readiness for the next order.

The flagman being in the position of “Ready,” the instructor will command,

“Up.”

At this command the staff will be brought over the left shoulder to a vertical position in front of the body, the right fore-arm horizontal, at the same time changing the grasp of the left hand so that the thumb shall be along the staff and pointed upward.

At the command,

“Swing,”

the flag will be dropped directly to the right until it nearly touches the ground; then, without pause, passed in a vertical plane to a corresponding position on the left, then back to the right and left, alternately, in a regular cadence, keeping the right hand stationary as a pivot on which the staff is moved, and taking time of movement from the guide, the swings being made in same time.

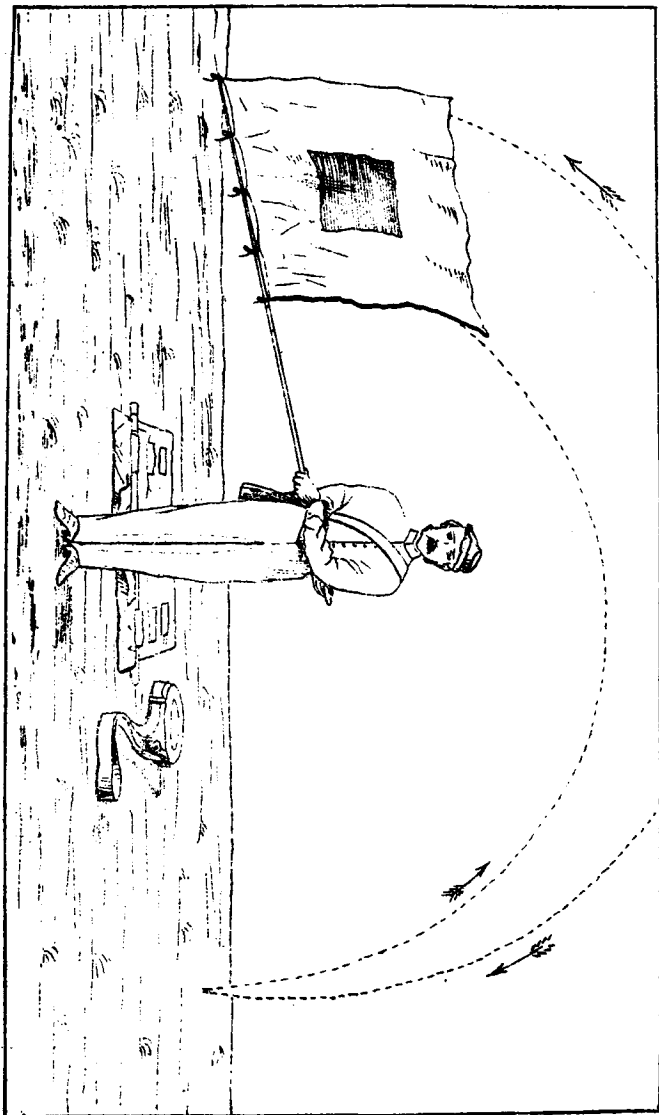
To stop this movement the instructor will command,

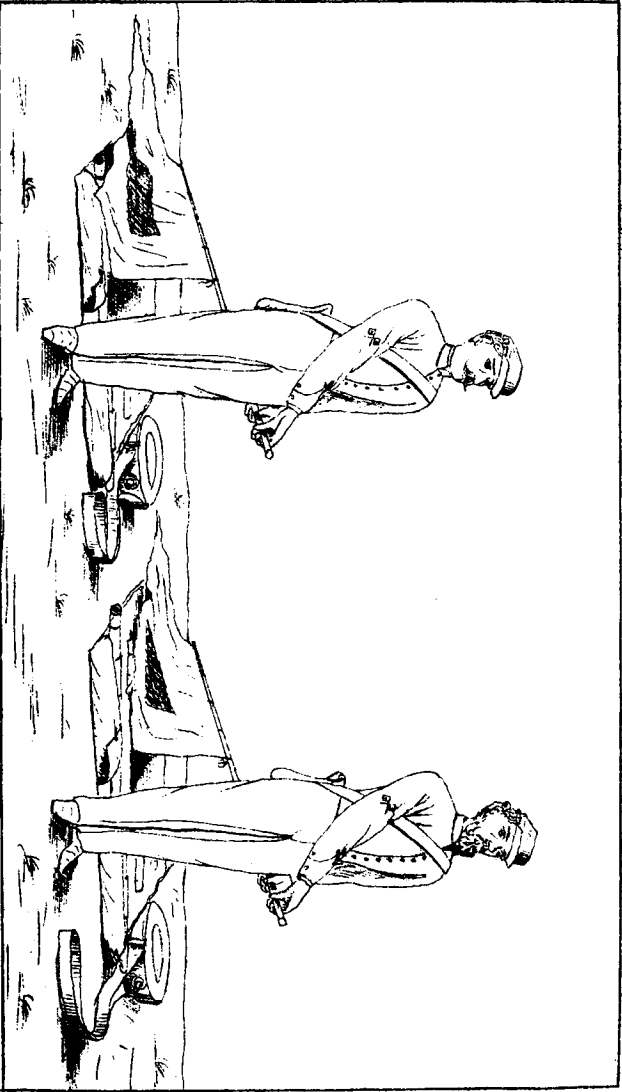
“Stand,”

when the flagman will bring the staff to a vertical position in front of the body, and remain stationary until ordered to assume some other position.

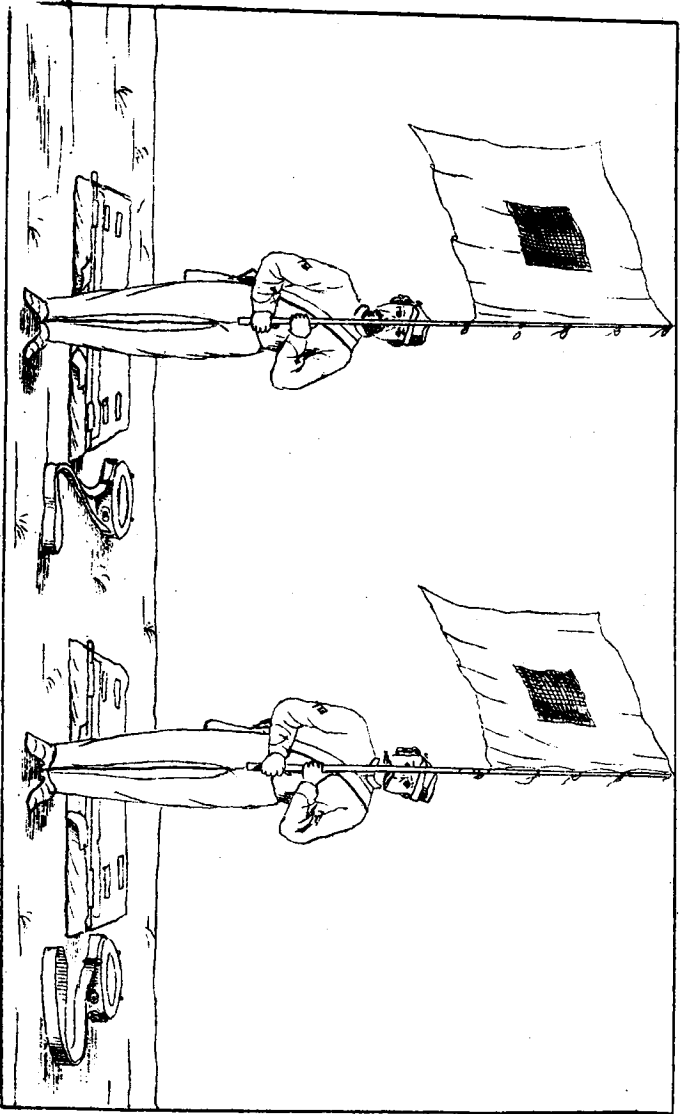


SWING.





READY.



UP.

The flagman from the position "Stand," ordered at any time during the drill, may be faced by the right to whatever position the wind makes most difficult for flagging—the end had in view being to insure skill on the part of the flagman by practice in unfavorable positions as relates to the wind. The flagman being in this position, the drill will be had in the positions and motions described in the *Manual of Signals*, the instructor ordering the alphabet and numerals by the signal numbers; or, at his option, by calling the letters, and the flagmen executing promptly, and together so far as is practicable, the requisite motions for each order. The drill may be continued with the alphabetic and other signal numbers until the instructor is satisfied with the execution of the orders. As a rule, the whole alphabet and the numerals must be ordered at each drill—the object being to insure that a perfect recollection of the necessary motions is retained by both officer and flagmen.

At the command,

"Rest,"

the flagman will drop the butt of the staff between his feet, keeping the staff vertical, and grasping it, with the flag gathered in folds (when but two joints are used), with both hands at the height of the breast, left hand above the right.

The flagman being at "Rest," the instructor wishing to bring him to the first position, will command,

"Ready,"

when the flagman will stand erect, and be in readiness for the command of execution,

"Up,"

when he will take promptly the first position, as described in the *Manual of Signals*.

To cause the flagman to stand at ease, the instructor will command,

“Down.”

At this command the flag will be dropped over the left shoulder to the rear, and the staff laid upon the ground. The flagman will now be at liberty to leave his position until recalled by the command,

“Post,”

when he will resume the position described for that order.

The command “Post” will always be used to call the flagman to his position, wherever he may be, and the command “Ready” is to be used as the equivalent of “Attention.”

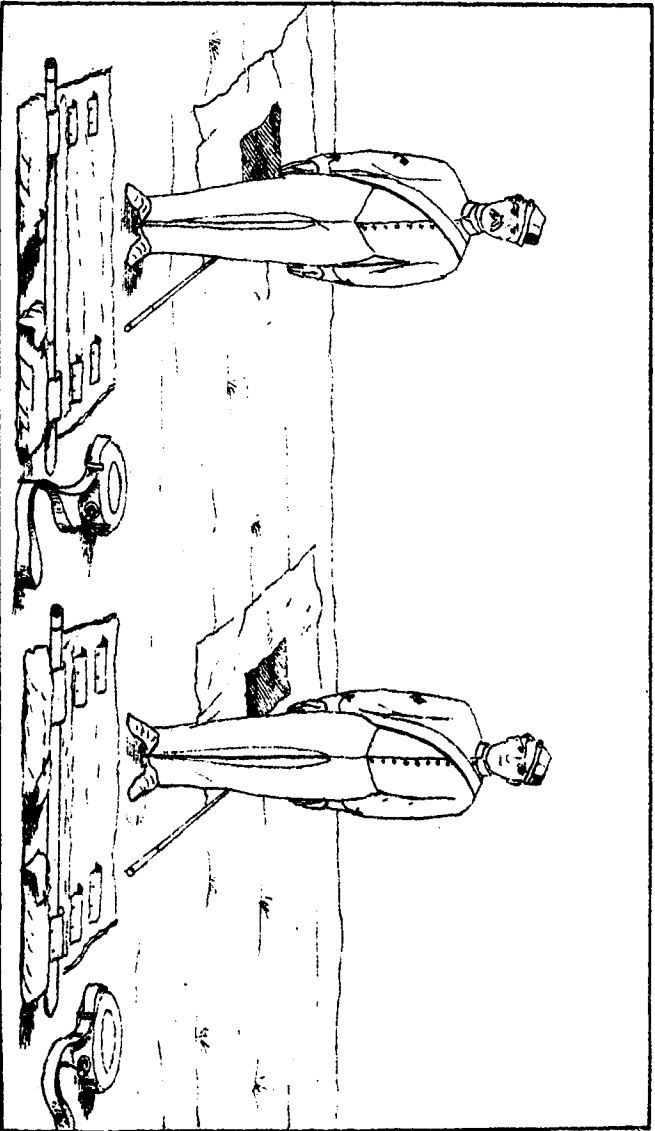
The drill being finished, the instructor will command,

“Repack kits,”

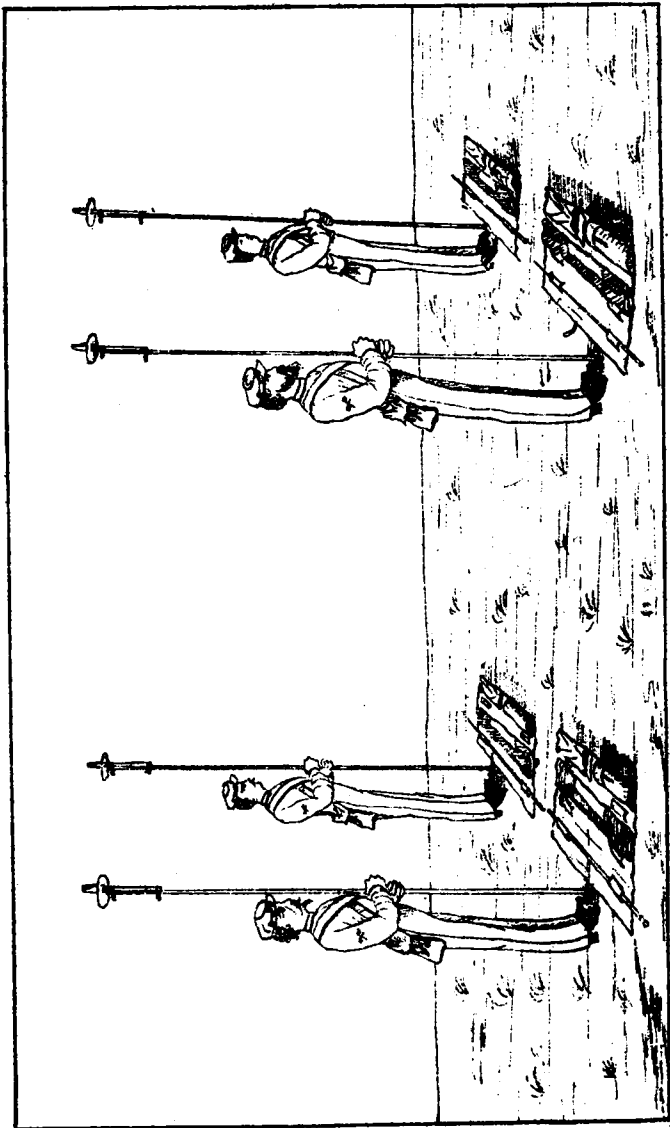
when each man will step back and take position twelve inches in the rear of his kit, detach the flag from its staff, the latter being held at the left side, unjoint the staff, and return the articles to their proper places in the kit; which will then be closed and restrapped, and the canteen reslung, the flagman then taking the position of “Order kits,” and standing at ease. Sometimes in drills and in service the flag may be carried attached to the tip joint of staff, the lower tie only being loosened to permit the tip to be detached from the second joint. When this is done it will cause the following changes in drills and inspection: At the command “Repack kits,” or “Return flags,” the lower tie only will be loosened, and the tip joint will be detached and returned to the kit, with the flag attached, neatly folded in three folds.

The next command will be,

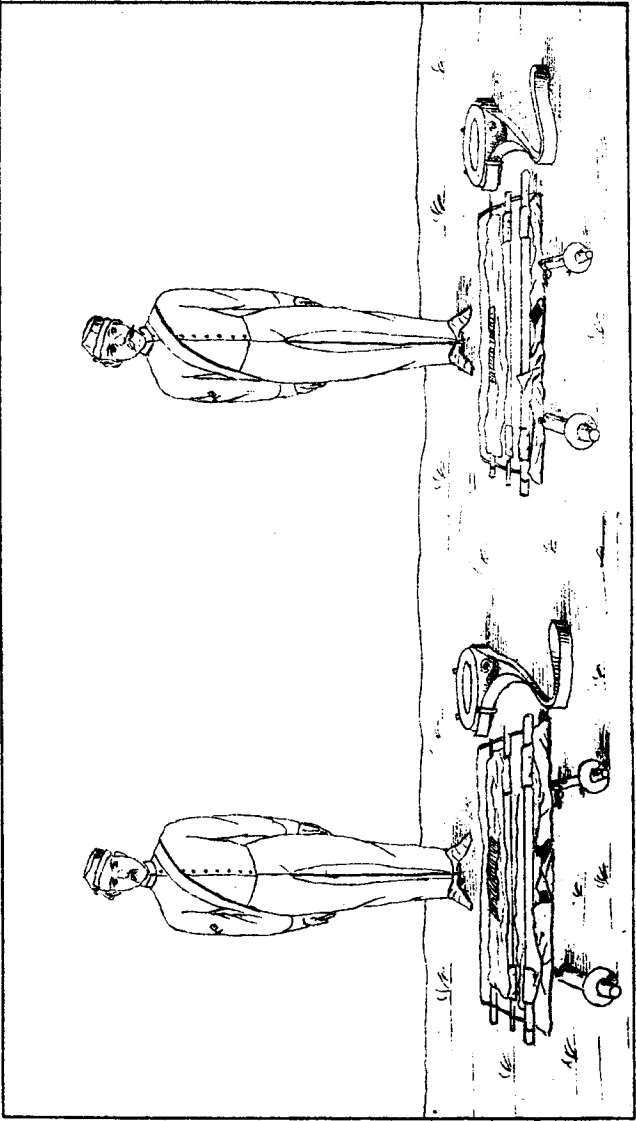
1. “Attention,”
2. “Carry kits,”



DOWN.

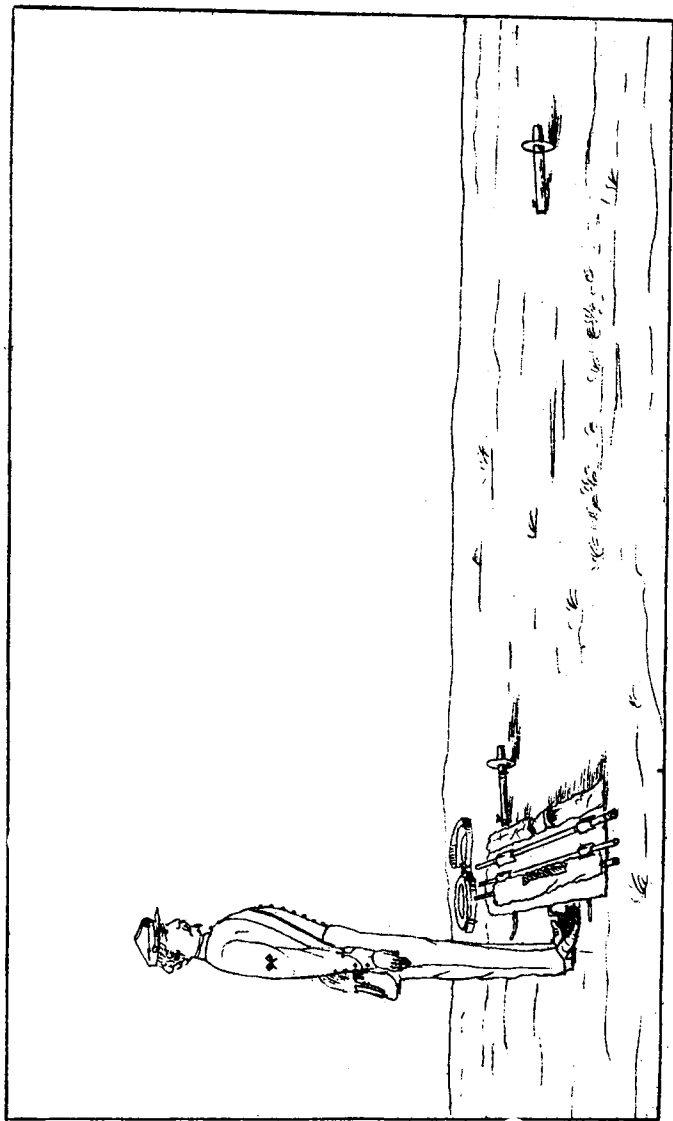


ATTACH—TORCHES. (2)

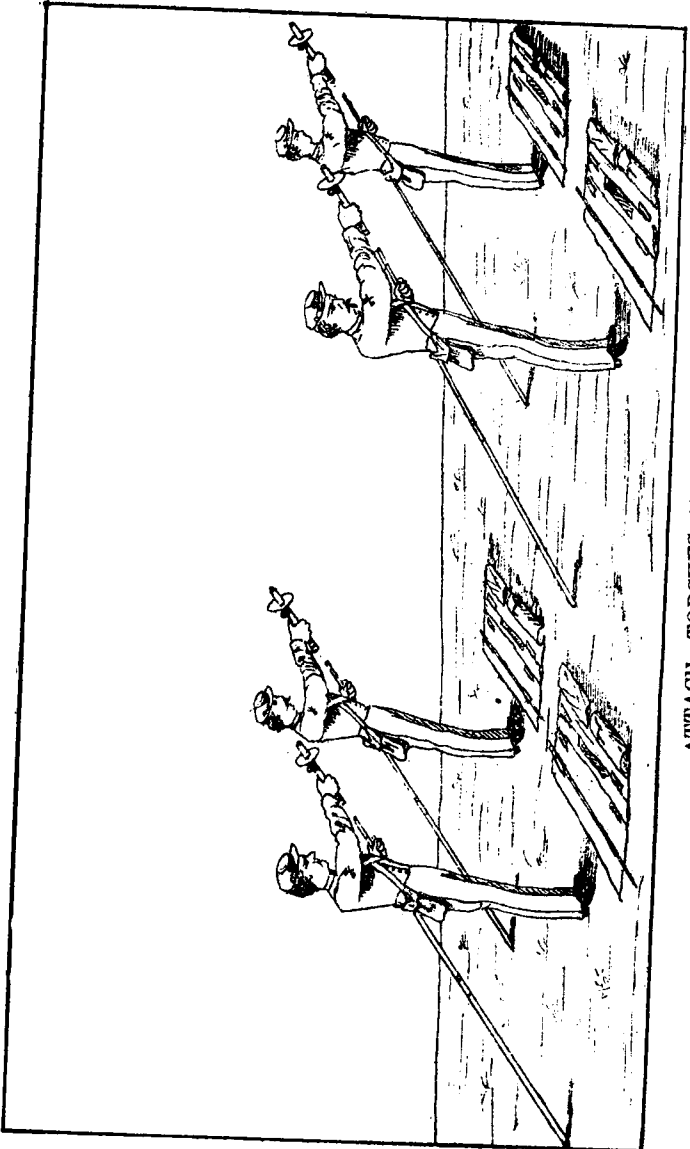


UNPACK—TORCHES.





FOOT-TORCH—PLACE.



ATTACH—TORCHES. (1)

after which intervals will be closed in the manner previously described.

### TORCH DRILL.

The class being on the drill-ground, intervals taken, and the kits unstrapped, if the drill is to be with torches, the command will be,

“Unpack torches.”

At this command, each man, stooping over, will take out the torches, putting a flame-shade and extinguisher on each, place them in front of their respective pouches, and perpendicular to the line of kits, and then resume the position of “Attention.”

The next command will be,

“Foot-torch, place,”

when each flagman, taking his foot-torch in the right hand, will move forward five paces, stepping over his kit in the first pace. He will then halt, place the foot-torch on the ground twelve (12) inches from his feet, opposite the centre of the kit, and perpendicular to it, and then return to his position in rear of kit.

The next command will be,

“Attach torches.”

At this command the lower joint of staff to be used will be taken from the kit with the left hand, and passed to the left of the body, the butt resting on the ground, the left hand near the top; the second joint is then taken out with the right hand near its base, and connected with the first joint; and the same process is repeated for the third joint when used. The butt of the staff is then thrown more to the rear, and the flying-torch attached.

After attaching flying-torch, to produce uniformity of motion, each man will bring the staff to the position of

“Rest;” and at the command “Down,” all, stepping over the kit, will bring staffs to the ground and in front, muzzle of flying-torch touching butt of foot-torch, and then return to his position, the staff and torch left lying upon the ground. The station is now arranged as it would be in the field before commencing work.

The instructor will then command,

“Fill torches.”

At this command each man will take the canteen from the ground in his left hand, taking the funnel from the haversack in his right hand, and, moving forward on left side of staff to the torches, will stoop, filling first the foot, then the flying-torch, and will then return (all taking time from the right) to his position, when all will together return funnels to haversacks with the right hand, and then replace canteens on the ground with the left hand. They will then stand at “Attention.”

The next command will be,

“Foot-torch, light,”

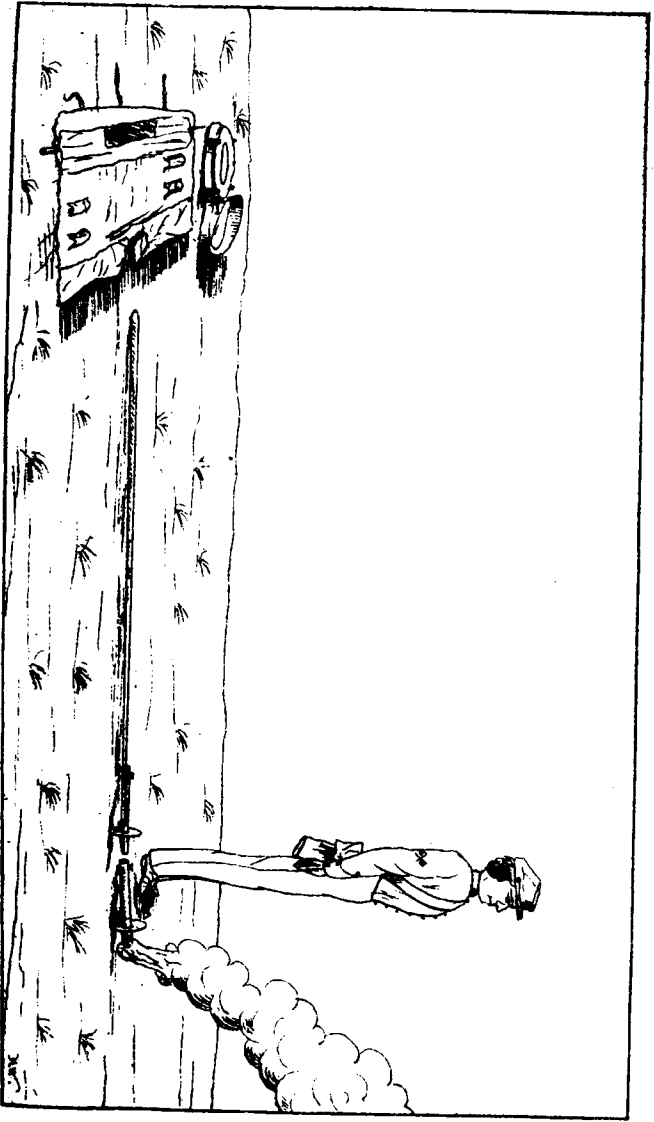
when the flagman will promptly remove the extinguisher from foot-torch and place it in the haversack, and then light the torch. After placing extinguisher in haversack, the flagman will remain at the foot-torch, standing at “Attention.”

In practice-drills the flagman will make the motions only for filling and lighting, merely touching the foot and flying torches with the funnel and canteen, without actually filling or lighting them.

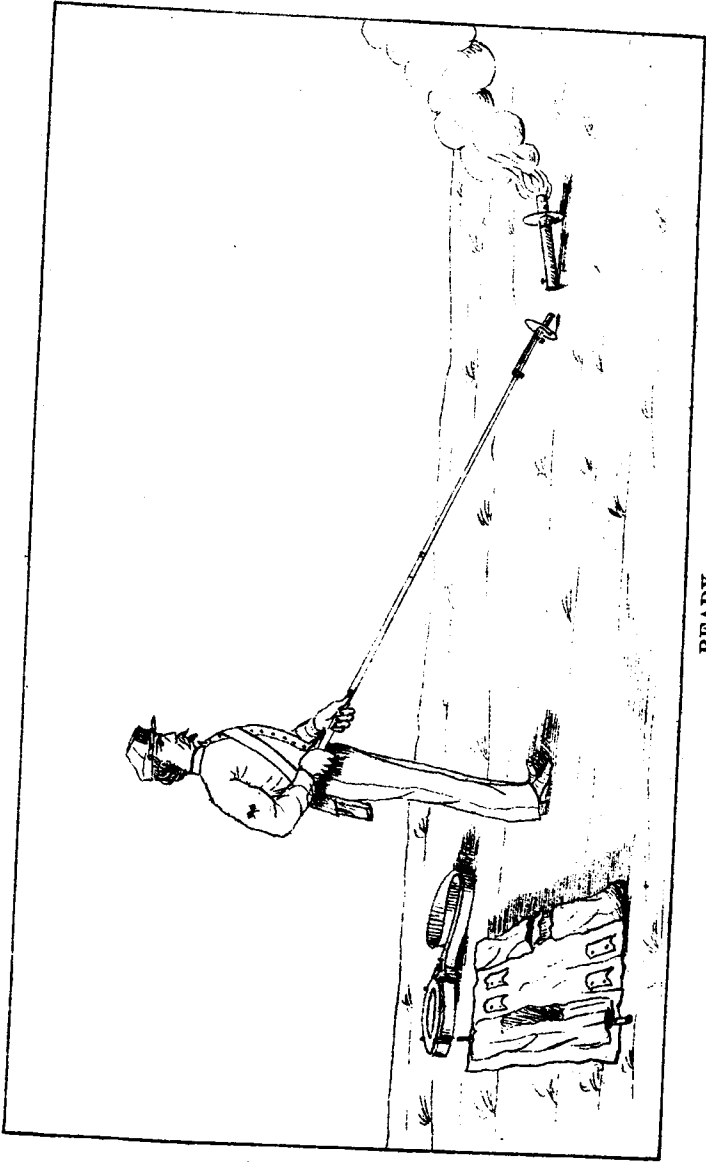
At the command,

“Post,”

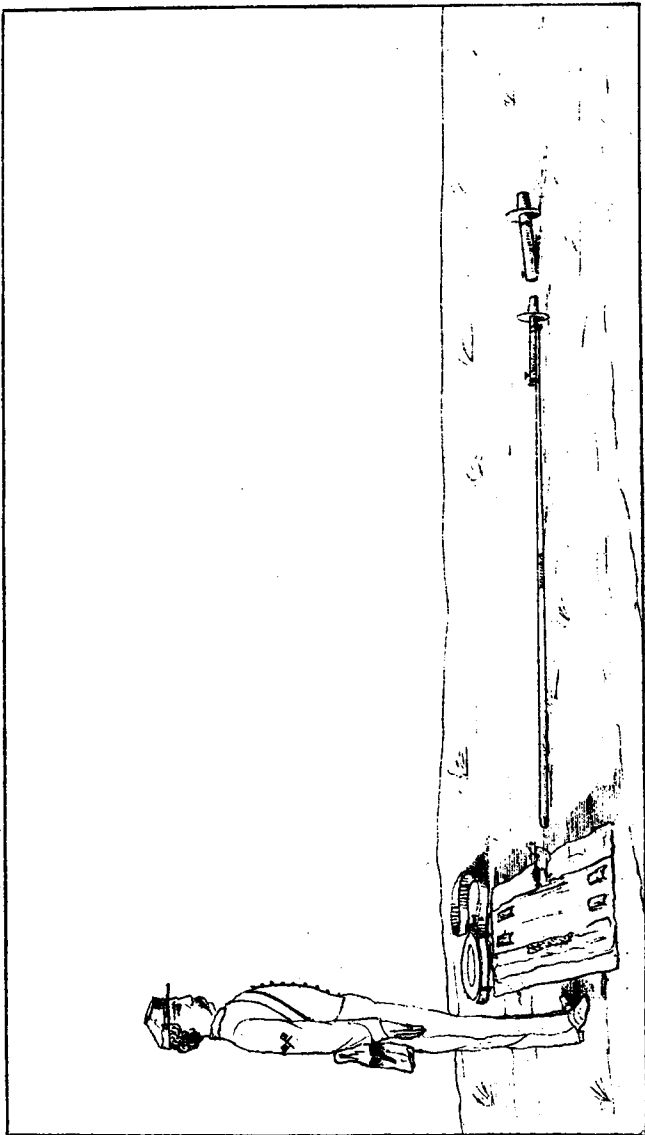
he will remove the extinguisher from the flying-torch, and place it in the haversack, then promptly take position at the butt of his staff, in front of the centre of his kit, grasp



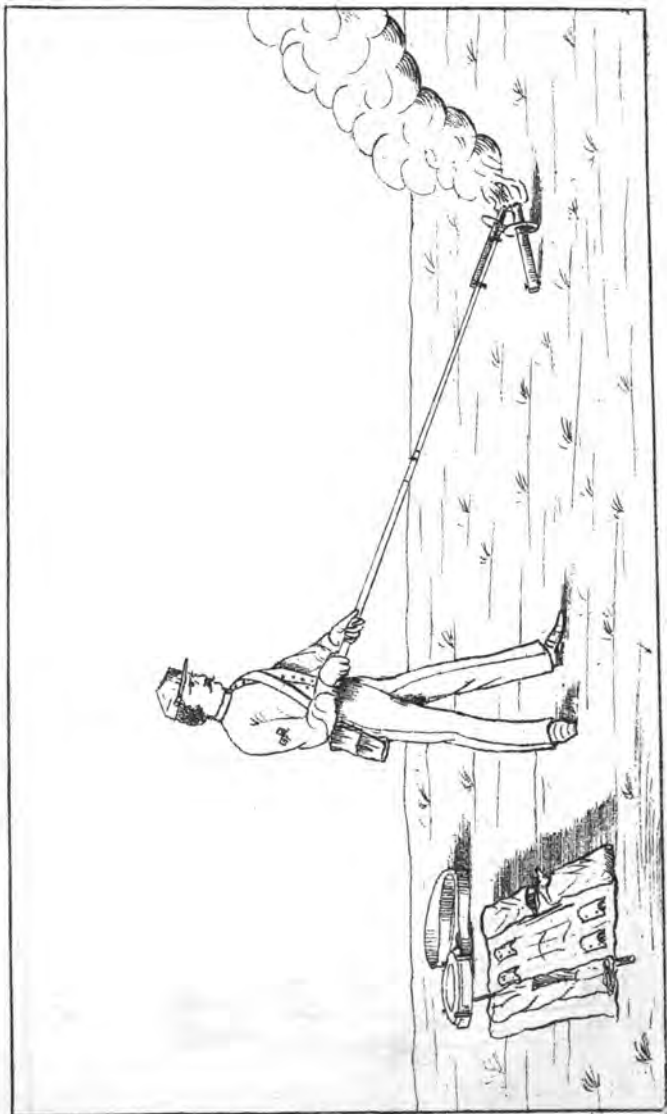
FOOT-TORCH—LIGHT.



READY.

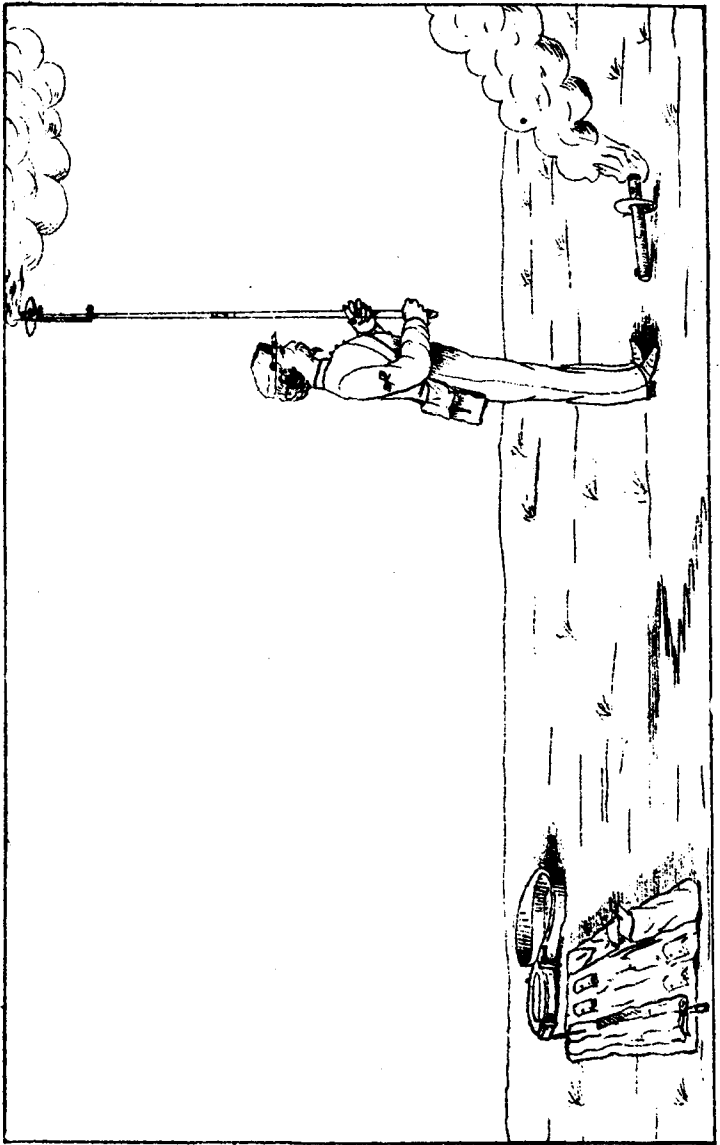


DOWN.



**LIGHT.**





the staff with the right hand at the butt, raise it to the height of his waist, and face directly toward the foot-light.

At the command,

“Ready,”

the flagman, being in the position of “Post,” will seize the staff with the left hand, eighteen inches from the butt, the thumb pointing from the body and nails up, and, standing erect, be in readiness for the next order.

The instructor will then command,

1. “Light.”

2. “Up.”

At the first command the torch is brought to the flame of the foot-torch and lighted. At the second command the staff is brought vertically in front of the body to the first position, the flagman stepping forward at the same time to a position one pace in rear of foot-torch.

The flagman being in the first position, the drills in the positions and motions will be had in the same manner as prescribed for flag-drill, the instructor giving the orders by signal numbers or letters, as before described.

The commands “Swing,” “Stand,” “Rest,” “Ready,” and “Up,” follow in the same order as in the flag-drill, and are executed in the same manner.

To cause the flagman to stand at ease, the instructor will command,

“Down,”

when the flagman will step to the rear, dropping the flying-torch in rear of the foot-torch, and laying the staff upon the ground, perpendicular to the line of kits.

At the command “Out,” which will immediately follow the command “Down,” the flying-torch will be extin-

of the rear rank at the same command close up, halt, and face to the proper front. Should the rear rank be the moving rank, at the third command, the file of the front rank on whom the movement is made, faces about; the corresponding file of the rear rank halts. The rest of the movement is executed as before indicated. The formations here given can, of course, be used for drills with disks, or with any kind of signal apparatus.

### FIELD TELEGRAPHS.

A few reels of wire at each frontier post, some simple instruments and appliances, can be furnished at an expense which, as compared to their usefulness, is trivial. A sergeant and half a dozen soldiers, taught as operators and line-men, are a sufficient establishment. When there is not need of telegraphic service, these soldiers, armed, are as valuable as any others; or taking the field with signal equipments and glasses, they offer everywhere to the commander a power which, a few years ago, was not imagined, and which every educated officer must now appreciate.

The subject of Field-telegraphs will for years give room, as a branch of military science, for study and improvement. The following Drill for a Telegraphic Train has been adopted for complete organizations in the signal service, and for the Instructions for Acting Signal-Officers. It is an illustration of the mode in which the duty is systematized. Though subject to changes in details, the main features of this drill are permanent. In the practice of the Acting Signal-Corps with a Section Train, an average speed of three miles an hour has been had in the erection of lines over fair ground. For short distances, and on especial occasions, lines have been erected with greater rapidity. All

guished, and the flagman at liberty to leave his position, keeping within call until recalled by the command,

“ Post,”

which command will always be used to call the flagman to his station, wherever he may be ; and when “ On post,” the command “ Ready” is to be used as the equivalent of “ Attention.”

Drill being finished, the instructor will command,

“ Repack kits,”

when the foot-torch will be extinguished, and torches emptied of any turpentine they may contain. The flagman will then grasp the staff with the left hand, six inches below the flying-torch, and the foot-torch with the right hand two inches above the nozzle, and return to his position in rear of kit, where he will remove the flame-shades and place them in the haversack, detach the flying-torch from the staff, which will be unjointed, and the several articles returned to their proper places in the kit. The kit will then be closed and restrapped, the canteen reslung, and the flagman will assume the position of “ Order kits,” standing at ease.

The next command will be,

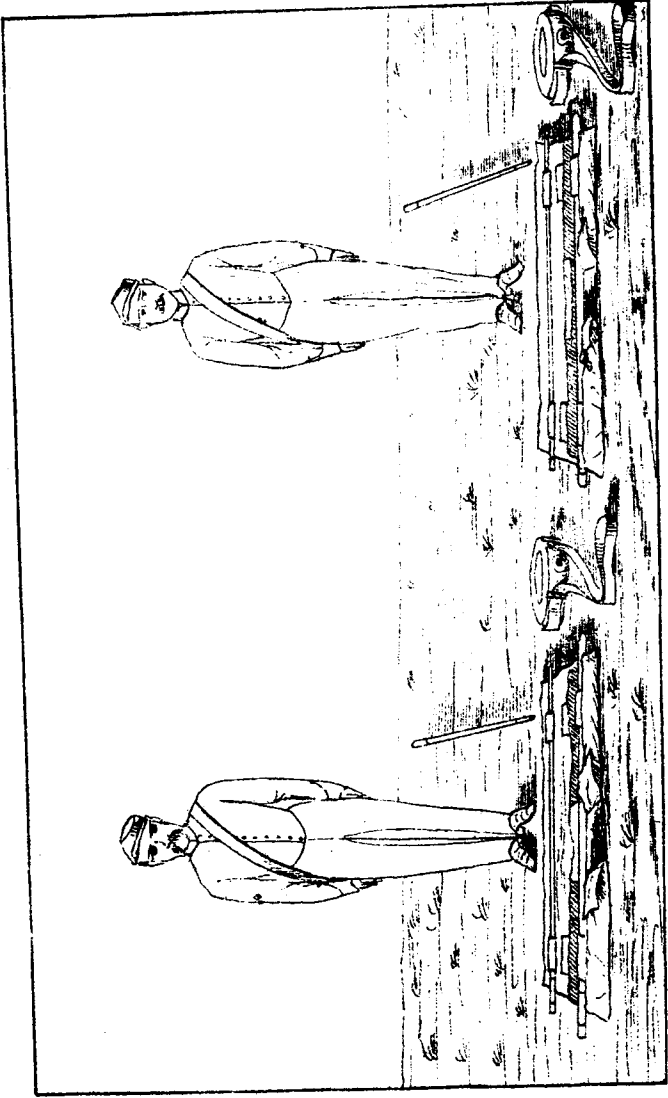
1. “ Attention,”
2. “ Carry kits,”

which will be executed and intervals closed in the manner hereinbefore described.

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Either flag or torch drill may be drilled separately ; or the drill may be continued from flag to torch, or from torch to flag, respectively. These changes often occur in service, and must be frequently illustrated in practice-drills.

When the instructor desires to change from flag-drill to



RETURN—FLAGS.

torch-drill (the flagman being at the position "Up"), he will command,

"Return flags."

At this command each man will return to his position in rear of kit, and, coming to the proper front, will throw the butt of staff to the rear on his left side, and will remove the upper joint with the right hand, fold the flag properly, and return both to their places in the kit, and place the lower joint of staff on the ground to his left and rear, perpendicular to but not touching the kit. The commands, commencing with "Unpack torches," will then be given and executed in the manner hereinbefore described. Should the change be from torch-drill to flag-drill (the flagman being at the position "Down"), the instructor will command "Return torches," when each man will take up his torches and staff as in "Repack kits," return to his position in rear of kit, removing the flying-torch from the staff, and return both it and the foot-torch to their pouches, the flame-shades having been first removed and placed in the haversacks. The butt-joint of staff will also be returned to its becket, and the torch-joint will be placed on the ground to the left and rear, perpendicular to but not touching the kit. The commands, commencing with "Attach flags," will then be given and executed in the manner prescribed in Form of Flag Drill.

When numerals in figures occur in a message, and it is designed to signal those numbers in *figures* and not in *words*, the signal "numerals follow," which signal is a whole wave of the flag (torch or wand) from left to right, passing vertically above the head—the flag being first dropped to the front before commencing the wave—must be made, in every case, before the first figure of the number; and the signal "numerals ended," which signal is a whole wave of the flag (torch or wand) from right to left, passing

vertically above the head—the flag being first dropped to the front before commencing the wave—must be made, in every case, after the last figure.

In all drills, whether with flag or torch, the instructor will require repetitions of any act or motion until it is properly performed.

Where the ground is limited, or it is for any reason desired, the class may be formed for drill in the *Manual of the Flag or Torch* in the manner hereinafter described for the instruction-drill with the wand, flag, or torch.

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#### FORMATIONS FOR INSTRUCTION-DRILL WITH THE WAND, FLAG, OR TORCH.

For instruction with the wand, flag, or torch, the class being formed on the drill-ground in two ranks, and faced to the front, the command will be,

1. "Front rank."
2. "Forward."
3. "Guide right (or left)."
4. "March."

The guide will be right or left, as intervals are to be taken to the right or left. If the practice is to be with the wand, the front rank will be marched forward from twenty to forty paces; if with the flag or torch, at least one hundred paces, depending upon the configuration of the ground.

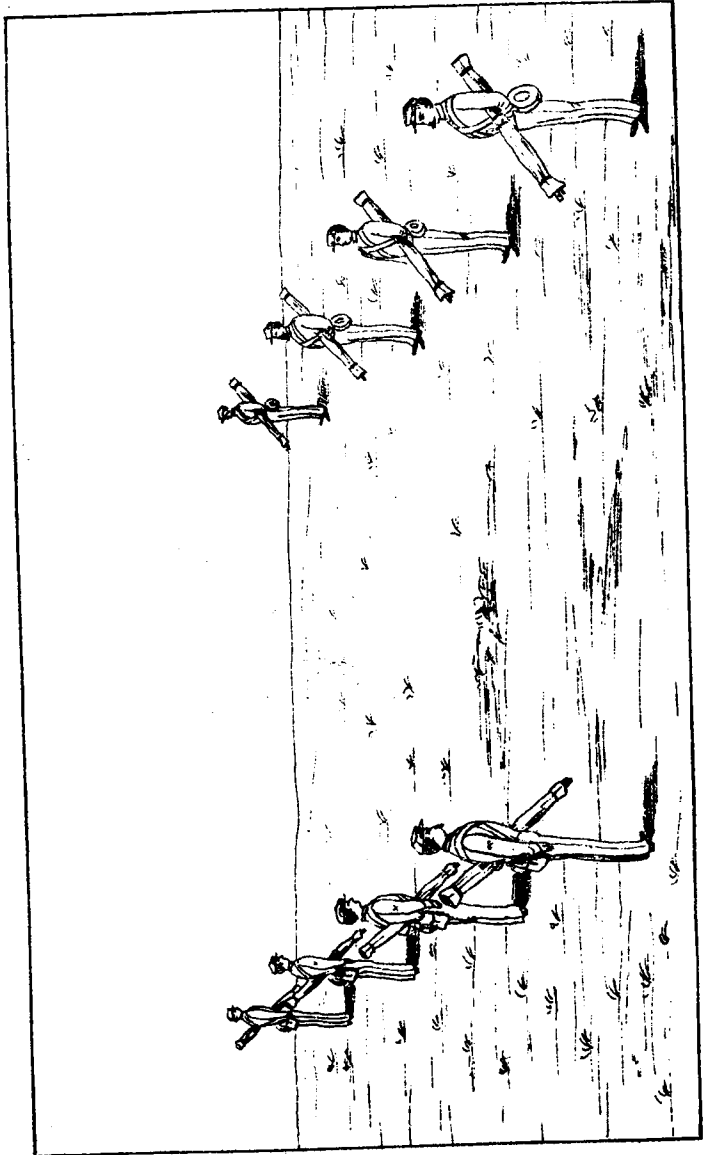
When the front rank has reached the ground upon which it is to be extended, it will be halted, and intervals will be taken by the commands prescribed in the instructions for drill with the flag or torch.

In taking intervals, each rear-rank man will regulate himself, as far as possible, upon his front-rank file. For the wand the interval will be three paces. When the intervals

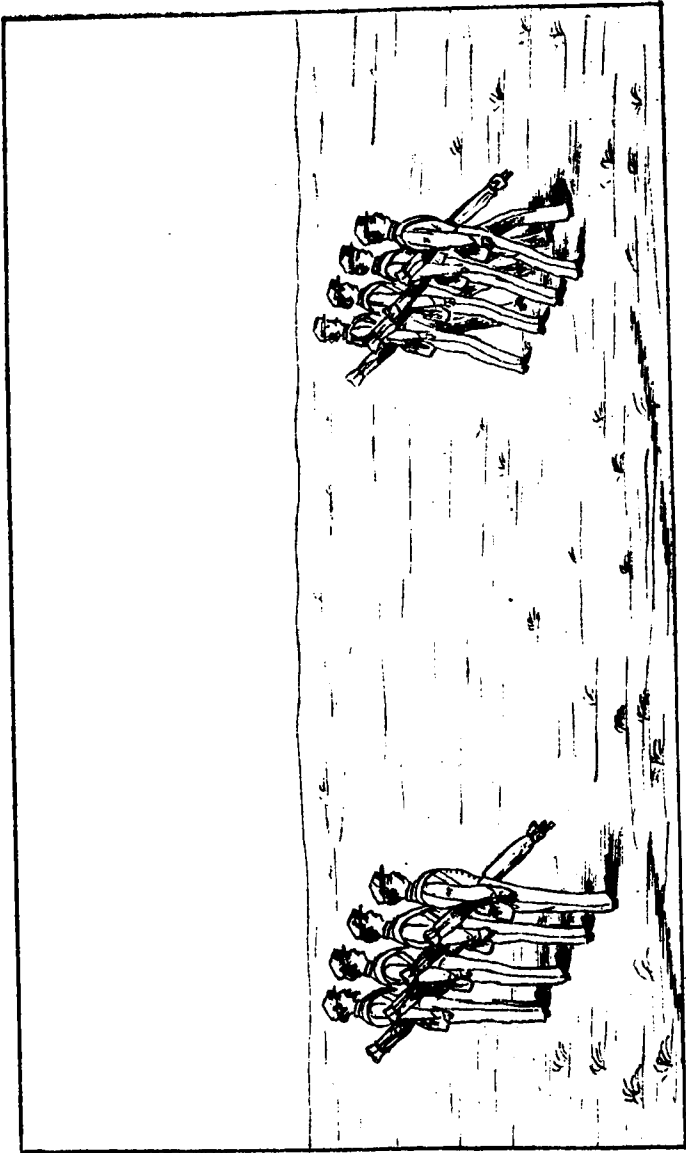


BY THE LEFT AND RIGHT FLANK CLOSE INTERVALS—MARCH.





INWARD-FACE.



**FRONTRANK FORWARD—MARCH.**

have been gained by the class the instructor will command,

1. "Detachment, halt."
2. "Inward, face."

After the second command the ranks will face toward each other, and the instructor will commence by each man in the front rank opening communication, as directed in the Manual of Signals, with his rear-rank file, and then sending a message and receiving one alternately, but each set of men to be independent of those on their right or left. When the formation is for a practice-drill in the Manual of the Flag and Torch, the drill will now be had and orders given as before described.

When the instruction-drill is finished, the command will be,

1. "Front (or rear) rank, forward."
2. "March."

At the second command the marching rank will move forward until within six paces of the stationary rank, when the instructor will command,

1. "By the right and left flank (or left and right)."
2. "Close intervals."
3. "March."

In the first command, the first flank indicated refers to the front rank; the second flank indicated, to the rear rank.

At the second command the stationary rank, except the file on which the intervals are closed, faces to the indicated flank. At the third command, which is given when the ranks are two (2) paces from each other, if the front rank is the moving rank, the last file of the flank toward whom the movement is made comes to the "right about" and halts; the other files, at the same command, flank in the direction before indicated, and as each successively closes his interval, halts and faces to the proper front. The files

the duties of setting up the lines, placing and working the instruments, preparing the batteries, and the transmission of messages, are performed by officers and soldiers. The messages are transmitted by sound, by the General Service Code of two elements. For actual service with a full train it is intended that four lines may be thrown out at the same time, from any centre or Headquarters, to any points with which communication is desired: or a single line may be detached and left behind, working as may be needed on the march: or two or more lines may be combined in one of greater length.

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## FIELD TELEGRAPH TRAIN.

### ORGANIZATION FOR AN ARMY CORPS.

A TRAIN consists of one (1) battery-wagon, four (4) wire wagons, and four (4) lance-trucks.

It will be divided into four (4) sections, each consisting of one (1) wire wagon and one (1) lance-truck.

The train will be commanded by a captain, and each section by a lieutenant.

The battery wagon will be fitted up as an office, from which four (4) lines may be worked, and will contain the necessary batteries, instruments, stationery, etc.

Each wire-wagon will be provided with ten (10) or twelve (12) miles of wire (some insulated and some plain), and a reel for reeling out and reeling up the wire, and will be arranged with instrument, stationery, etc., for an office.

Each lance-truck will carry from three hundred (300) to five hundred (500) lances, seventeen (17) feet long, on which the line is to be erected, a supply of insulators and

insulator-spikes, and the equipments, consisting of crow-bars, climbers, and marking-pins.

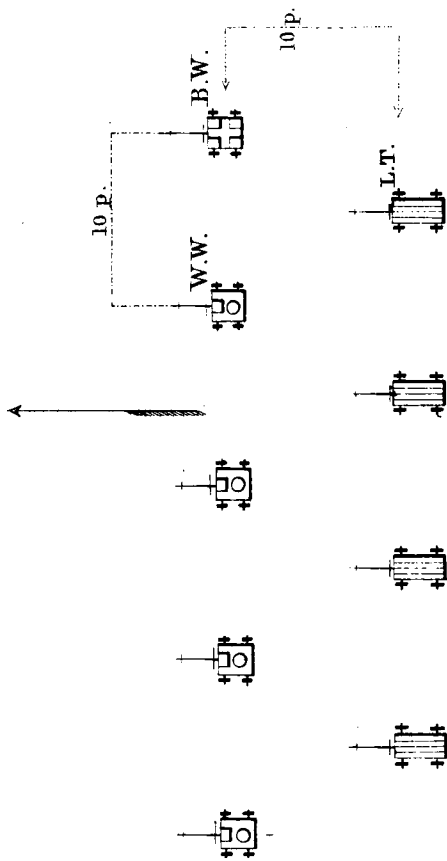
The force required for the battery-wagon providing for lines will be one (1) driver, twelve (12) operators, and one (1) battery-man. The duty of the latter is to take charge of the batteries and other material contained in the battery-wagon.

Each section (wire-wagon and lance-truck) requires one (1) lieutenant and forty (40) enlisted men, distributed as follows:

One lieutenant in charge of section; one (1) director and two (2) markers, whose duty is to indicate the route of the line of wire to be erected; one (1) surveyor, who follows along the line indicated by the markers and points out the places where the lances are to be erected; three (3) pinmen, the first and second of whom accompany the surveyor and place marking-pins at the points indicated by him; the third pin-man gathers the pins as the line is erected; thirteen (13) bar-men (one being a non-commissioned officer and in charge), who, armed with crowbars, make holes large enough to receive the lances at the places marked by the pins; two (2) wire-men, who have charge of the handling of the wire when reeling out and reeling up; three (3) operators, who accompany the wire-wagon; thirteen (13) lance men (one a non-commissioned officer in charge), two (2) of whom ride on the lance-truck, and, attaching spikes and insulators to the lances, pass out a lance at each point indicated by a marking-pin; the remaining eleven (11) follow the wire-wagon and erect the line on the lances; one (1) driver for the lance-truck; one (1) driver for the wire-wagon.

The force required to work the whole train is five (5) commissioned officers and one hundred and seventy-four (174) men.

PLATE XXXI



Full Train in Park.

The capacity of the train is to erect fifty (50) miles or more of portable telegraph-line, four separate lines, as connecting with corps headquarters from headquarters of division of an army corps, being extended at the same time.

A full train is parked as shown in Plate XXXI.

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## SECTION TRAIN.

### ORGANIZATION AND FORM OF DRILL FOR SECTION TRAIN OF FIELD TELEGRAPH TRAIN.

The section train will consist of one (1) battery-wagon, one (1) wire-wagon, and one (1) lance-truck, and be manned by one (1) lieutenant and forty-five (45) enlisted men, distributed as follows :

Lieutenant as chief of section ; one (1) director and two (2) markers ; one (1) surveyor and three (3) pin-men ; thirteen (13) bar-men ; two (2) wire-men ; thirteen (13) lance-men ; six (6) operators ; three (3) drivers, and one (1) battery-man.

The minimum force for illustrative drills with a section train is as follows: One (1) lieutenant, one (1) director (dismounted); one (1) surveyor, two (2) pinmen, seven bar-men, two (2) wire-men, seven (7) lance-men, two (2) operators, and three (3) drivers.

It will be parked in the following order :

Wire-wagon in line with and ten (10) paces on the left of the battery-wagon, and the lance-truck in rear of the centre of the wagons, with distance of ten (10) paces, as indicated in Plate XXXII.

At the "first call" the drivers, director, and markers will saddle and harness up.

When the "assembly" is sounded the drivers will lead

out and hitch up, the director and marker will lead out and take position immediately in front of the train, and with the drivers will stand at "attention" and "dismounted." The drivers when dismounted will always stand at their horses' heads.

The men for duty with the section will be formed on the parade in two ranks, the roll called, and the detachments told off, the latter taking position in the following order: The surveyor and pin-men on the right, the bar-men with an interval of two paces, the wire-men with an interval of two paces, the lance-men with an interval of two paces, the operators and battery-men with the same interval.

They will be marched in column of detachments to the ground where the train is parked, and wheeled into line by the flank previously designated, facing the train. (Plate XXXII.)

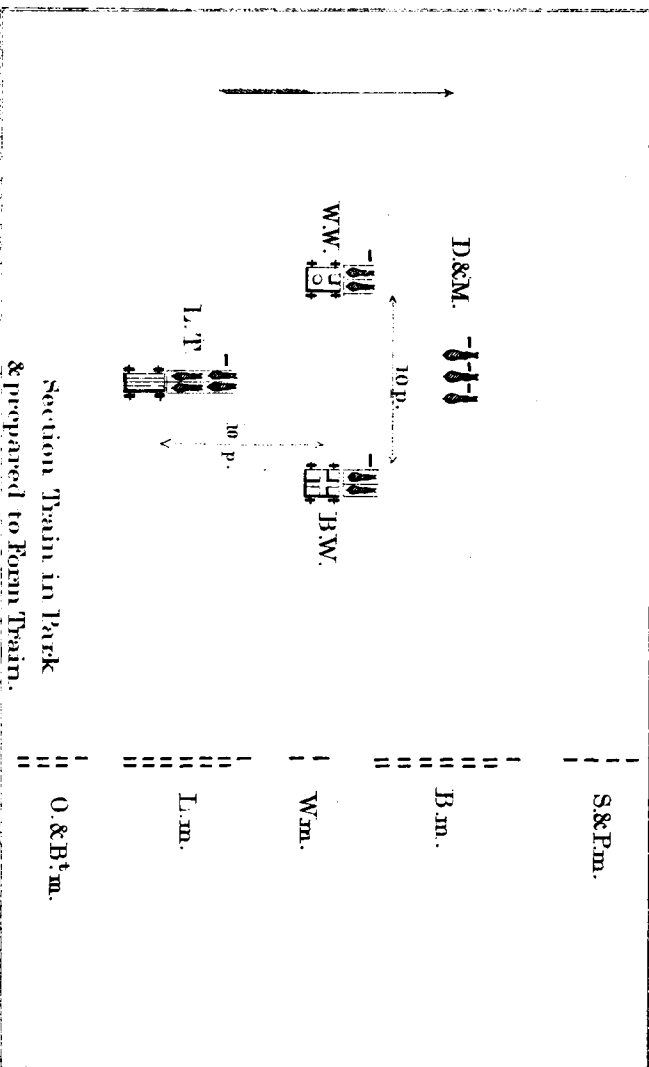
The section train being in park, with the detachments in line near it, the chief of train wishing to form the train in column of route, will command,

1. "Form train front (right, left, or rear").
2. "March (or double time, march)".

*The train is always formed on the line of direction of the battery-wagon, whether the train be in disorder or in park.*

At the 1st command the director, markers, and drivers mount, and director and markers and battery-wagon move, if necessary, to take the direction indicated. The chiefs of detachments give the cautionary commands to cause their detachments to move toward the proposed front. At the 2d command the battery-wagon halts, the director and markers take post twenty (20) paces to the front of the battery wagon. At the same command, which will be repeated by the detachment commanders, the detachments will move off and form in close column in the same relative





Section Train in Park  
& prepared to Form Train.

PLATE XXXIII.

D.&M.



----- S.&P.m.

===== B.m.

-- W.m.

===== L.m.

----- O. & B<sup>t</sup>.m.

20 p.

W.W.



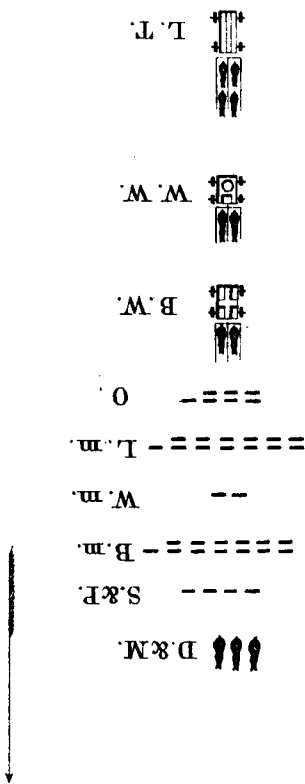
B.W.



L.T.



Form Train.



order as before, behind the director and markers. (See Plate XXXIII.)

The section being formed for the march, the park will be broken and it will be moved forward by the command,

1. "Forward,"
2. "March,"

when the director and markers will move forward, followed in order by the column of detachments, the battery-wagon, the wire-wagon, and the lance-truck.

On the march the section is formed as shown in Plate XXXIV.

The direction and swiftness of the march will be regulated by the movements of the director and markers, under the orders of the captain.

The section being on the march, to halt it previous to opening station, the chief of section commands,

1. "Section."
2. "Halt."

To open station the chief of section will command,

1. "Open station, right (or left").
2. "March."

At the second command the battery-wagon will move out of the column to the point indicated and be followed by the battery-man and three (3) operators; at the same time the wire-wagon and lance-truck will close up to the column of detachments; the driver of the battery-wagon will unhitch his horses and stand at their heads, and the battery-man will make necessary ground connection. To make this connection the battery man will take a ground-bar from the battery-wagon and drive it two-thirds of its length into the earth (to make a good connection the bar must penetrate moist earth), and connect its top by a wire to the negative (zinc) pole of the battery. The operator

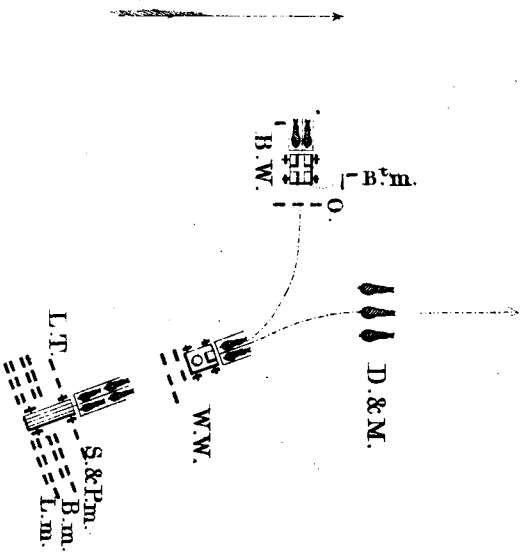
in charge will prepare the table, place the instrument in position to transmit signals, connect the positive (copper) pole of the battery to one of the screw-posts of the instrument, and when five lances have been erected, detach the line-wire from the wheel, and attach it to the other screw-post of the instrument. An operator remains in charge of the instrument until the line is recovered, the battery-wagon becoming an office.

To open station, the train being in march, the command will be the same, (1. "Open station, right (or left.)" (2. "March.") At the command "March," the detachments *halt* under command of the chiefs of detachments; the battery-wagon wheels out of the column in the direction indicated, and the wire-wagon and lance-truck close up upon the column of detachments and halt. The command will then be,

1. "Equip."
2. "March (or double time, march)".

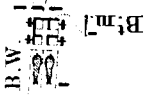
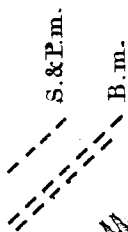
At the first command, the chiefs of detachments will cause them to face about. At the second command, which will be repeated by the chiefs of detachments, the latter will separate and move in equal divisions on either side of the train, the operators and two wire-men taking position at and to the rear of the wire-wagon, and the lance-men, bar-men, and pin-men on either side of the lance-truck, where they will take equipments and face toward the front of the train; the lance-men opposite the rear wheels, the bar-men between the wheels, bars held in both hands with the points resting upon the ground, and the pin-men and two lance-men, who are to deliver lances, opposite the front wheels of the lance-truck. (See Plate XXXV.) The command will then be given,

1. "To your posts."
2. "March (or double time, march)".



Open Station and Equip

PLATE XXXVI.



Prepare to Reel out.

At the first command the director and markers move forward twenty (20) paces, and the bar-men raise the bar to the right shoulder ; the two designated lance-men mount the lance-truck.

At the command "March," the surveyor and pin-men move to the front and immediately behind the director and markers. The bar-men follow the surveyor and pin-men. At the same time the lance-truck will pass the wire-wagon and close up upon the bar-men. The lance-men are marched to the rear of the wire-wagon.

At the command,

1. "Prepare to reel out,"

the director having been instructed by the lieutenant as to the direction and route of the line, moves forward rapidly with the markers, stationing the first marker at a point about 300 feet from the wire-wagon. One of the wire-men takes the end of the wire from the wire-wagon and makes it fast to the wheel of the battery-wagon. (See Plate XXXVI.) The first pin-man, under direction of the surveyor, marks the first hole about thirty (30) paces from the battery-wagon, a bar-man falls out to make it, and the first lance is delivered by it. The command is then given,

1. "Reel out."
2. "March."

At this command the director moves forward, taking the second marker and stationing him at a second point on the route, visible to the first marker. The distances between the markers thus placed will be necessarily regulated by the topography of the country. The lieutenant moves forward ; the surveyor follows on the line indicated by the markers, and is accompanied by two pin-men.

The first pin-man, with forty (40) marking pins (for one



mile of line), follows the surveyor, who paces the distance of fifty-five (55) steps, or one hundred and thirty-two (132) feet, the distance between poles, and indicates the points where the pin-man shall place the pins.

The second pinman, similarly equipped, also accompanies the surveyor, and relieves the first when the pins of the latter are used up.

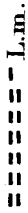
The third pin-man takes station at the first pin placed.

The bar-men (each with a crowbar) follow the pin-man, making by the side of each pin thus placed a hole large enough to admit the foot of the lance easily, and two feet deep, the length of the bar from point to shoulder being the measure, and the hole being made, leaving the pin beside to guide the lance-men. The bar-men marching in two ranks, the bar-men on the right of the front rank will, under the direction of the chief of bar-men, fall out to make the first hole or lance-step: when it is made, he will rejoin at double time the detachment of bar-men, falling in on the left of the front rank. The second hole or lance-step will be made by the first bar-man of the rear rank, who falls out to make it as the detachment passes the second pin, and afterward rejoins the left of the rear rank of the detachment, following the general plan of movement as just described. The third hole is made by the second bar-man of the front rank; the fourth by the second bar-man of the rear rank; and thus in succession, the bar-men falling out alternately from front and rear ranks, and rejoining at double time the left of their respective ranks as each lance-step is completed.

The lance-truck will follow close upon the bar-men, the two lance-men in the truck attaching an insulator to each lance, and delivering a lance so prepared at each hole.

The wire-wagon, with operators and two wire-men, follows the lance-truck, reeling out the wire; the first wire-

PLATE XXXVII.



W.W.  
W.m.  
O.  
S.&P.m.  
B.m.

L.T.

Take Station

man in the wagon in charge of reel, and the second wire-man following, carrying wire to the line of poles.

The lance-men, thirteen (13) in number, follow the wire-wagon, placing the wire in the insulators and erecting the lances, taking care to force them to the bottoms of the holes, and that the insulator spikes, if used, are at right angles to the line, and the insulators properly adjusted.

The lance-men marching in two ranks, the first file (front and rear rank man) will fall out and erect the first lance; after which they will join at double time the detachment of lance-men, falling in on the left. The second file will erect the second lance; and so on, following the general rule indicated above. The lances are set under the supervision of the chief of lance-men.

The third pin-man now follows the lance-men, and as the line is erected, gathers the pins and delivers them to the pin-man, who sets them, and who waits at the point where he placed the last pin, when the latter pin-man moves in double time to the front and relieves at the proper moment the one who precedes him.

The end of the line having been reached, the command will be given,

1. "Take station, right or (left)".
2. "March."

At the command "March," the lance-truck halts and is passed by the wire-wagon, which moves to take the position indicated by the chief of section, when ground connection is made by a wire-man. To make this connection, the wire-man drives the ground-bar in the same manner as at the battery-wagon, and connects its top to the positive (copper) pole of battery. The operator in charge arranges the tables, places the instrument, connects the line-wire to one screw-post thereof, and the other screw-post to the

negative (zinc) pole of the battery, and takes charge of the instrument. Messages must be transmitted to test the line, and telegraphic practice is then had, the wire-wagon becoming the outlying office.

As they come in, the lance-men take position behind the lance-truck, and the bar-men and pin-men behind the wire-wagon. The drivers will then unhitch their horses and stand at their heads. The train is now arranged as in Plate XXXVII.

Having thus formed, the equipments of bar-men and pin-men are returned under direction of chief of section, and such disposition made of the men as may be advisable, under his directions.

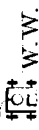
As soon as communication is opened, after extending a line, the operator will immediately report the fact to the officer in charge of the end of the line where he may be working (*i. e.*, to the captain at the battery-wagon, and to the lieutenant at the wire-wagon). There shall always be a sufficient detail of orderlies or messengers to transact all duties that may be required of them at each station on the line.

Details should then be made for patrols, who should be well instructed in all the duties of line-men; they will be required to guard the line, make repairs, keep the wire at a proper tension, see that the poles are firmly set into the ground, that they are erect and well dressed, and omit nothing in their power to keep the line in an efficient and reliable condition for working. Each patrol will be equipped with the necessary tools and material, will be assigned to a particular range, and will be held responsible for the condition of the line under his charge. The whole line will be frequently inspected by thorough and competent non-commissioned officers, who will report the result of each inspection to the officer in charge.

PLATE XXXVIII.



W. Jn.



W. W.



O.

S. & P. m.

B. m.

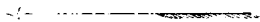


L. T.



L. T.

Prepare to Reel up.



To recover the line, the ranks being broken, the command will be given,

“Fall in,”

when the detachments will resume the positions occupied by them in “Take station,” as shown in Plate XXXVII.

The command will then be given,

1. “Attention.”
2. “Close station.”
3. “March.”

The wire-man removes the ground connection and replaces the bar in the wagon, the horses are hitched to the wagons, and the drivers mount. At this order the operator in charge detaches the instrument, and places it and the table apparatus in the pouches in which they are transported, secures the table in proper position for moving, and takes care that nothing in his charge is in the way of the wire-men while reeling up.

At the command,

1. “Prepare to reel up,”

the wire-wagon and lance-truck wheel about on their own ground and then stand fast, the wire-men following in rear of wire-wagon. The lance-men, bar-men, and pin-men and operators are faced about. (See Plate XXXVIII.)

At the command,

1. “Reel up.”
2. “March,”

the lance-men commencing at the wire-wagon, draw the lances, free the wire from the insulators, and pass the lances into the truck. The two men in the truck receive lances, detach insulators, and return parts thereof and lances to their places.

The wire-wagon following, reels up the wire, the pin-men

assisting the wire-men, and the bar-men taking care that the wire does not run into kinks or become entangled, so as to prevent it from being readily reeled up. Operators are employed as occasion indicates. Care should be taken that the lance-truck and wire-wagon are not more than one hundred and fifty (150) paces apart, and the lance-men not more than three lances in advance of the lance-truck.

Upon reaching the central station, and when the lance-truck reaches the first lance, the lieutenant will command,

1. "Section."
2. "Halt."

At the command from the chief of train,

1. "Close station,"
2. "March,"

the wire-wagon reels up to the end of the line, passing the lance-truck, and moves in rear of the battery-wagon. The detachments retain their relative positions, and the horses are hitched to the battery-wagon; the wire-man detaches the line from the battery-wagon, and the battery-man removes the ground connection, and replaces the bar in the wagon.

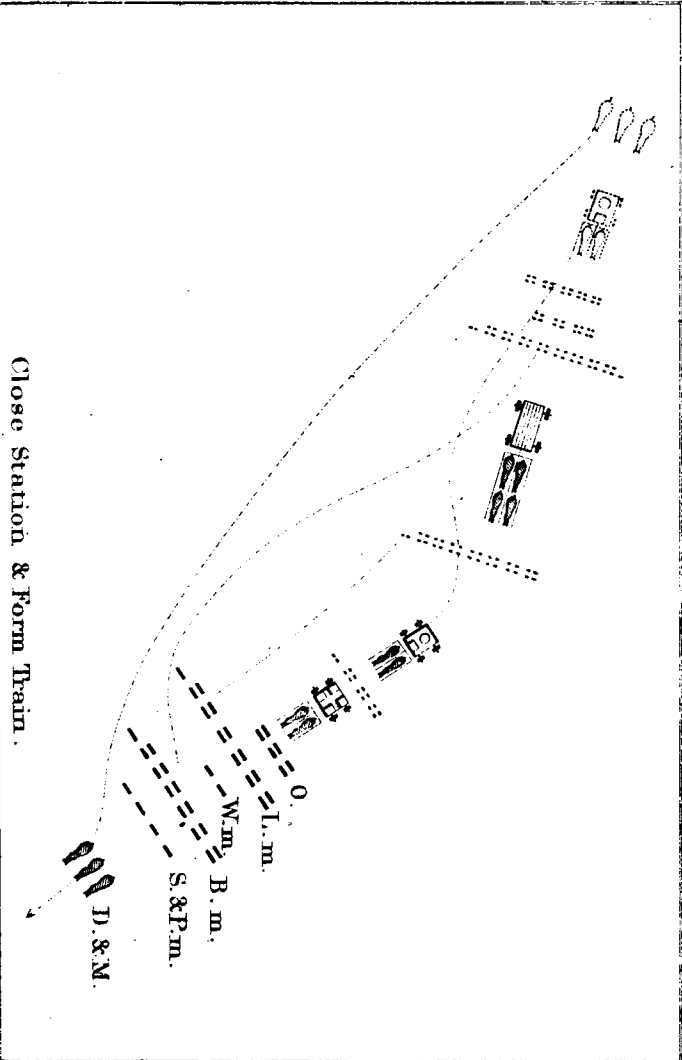
At this order, also, the operator in charge detaches the instrument, and places it and the table apparatus in the pouches, secures the table, and makes ready for the movement. (See Plate XXXIX.)

The chief of train then commands,

1. "Form train front (right, left, or rear"),
2. "March (or double time, march"),

when the detachments will be promptly placed as directed in the train formed for the march.

The command, "Form train front (right, left, or rear), march," may be given at any time by the chief of train



Close Station & Form Train.



when it is necessary to change his design of reeling out, etc., provided the wagons are near together.

The general rule governing the movement is, that the director and markers shall move, if necessary, twenty paces in front of the battery-wagon (which is turned toward the proposed front of the train) when the command "Form train" is given; then, at the command "March," the detachments take the shortest line to their places in column, in front of the battery-wagon, and the wire-wagon and lance-truck wheel as nearly into their proper places as the nature of the ground will allow, so that they may gain them at once; then the train is moved forward by the usual commands. The train being in column *en route*, in order to change direction by the head of column to the right or left, the chief of train will command,

1. "Train right" (or left).
2. "March."

At the command "March," the director and markers wheel to the right (or left), and each detachment and wagon, as it comes on the same ground, takes the new direction.

The train being in column or in line, to gain distance to the right or left without changing from the order in column to the order in line, or the reverse, the command will be,

1. "Right (or left), oblique."
2. "March."

At the second command the detachments and wagons will all oblique to the right (or left). If the movement be from column, the guide will be toward the head of column. If from line, it will be the flank toward which the oblique is made. To resume the direct march the command will be,

1. "Forward."
2. "March."

The train being in column *en route*, in order to move in line to the right or left, the chief of train will command,

1. "In line, right (or left)".
2. "March."
3. "Guide left (or right)".

At the first command the chiefs of detachments caution them to wheel to the right (or left).

At the second command each detachment and wagon turns to the right (or left) and moves forward in line, the guide being toward the director and markers.

The drivers must be careful to preserve their intervals and keep the heads of their lead-horses dressed on the line. (See Plate XL.)

The train may be halted by the command,

1. "Train."
2. "Halt."

The train being in line (either at a march or halt), it may be formed in order of column to the right or left and moved forward by the commands,

1. "In train, left (or right)".
2. "March."

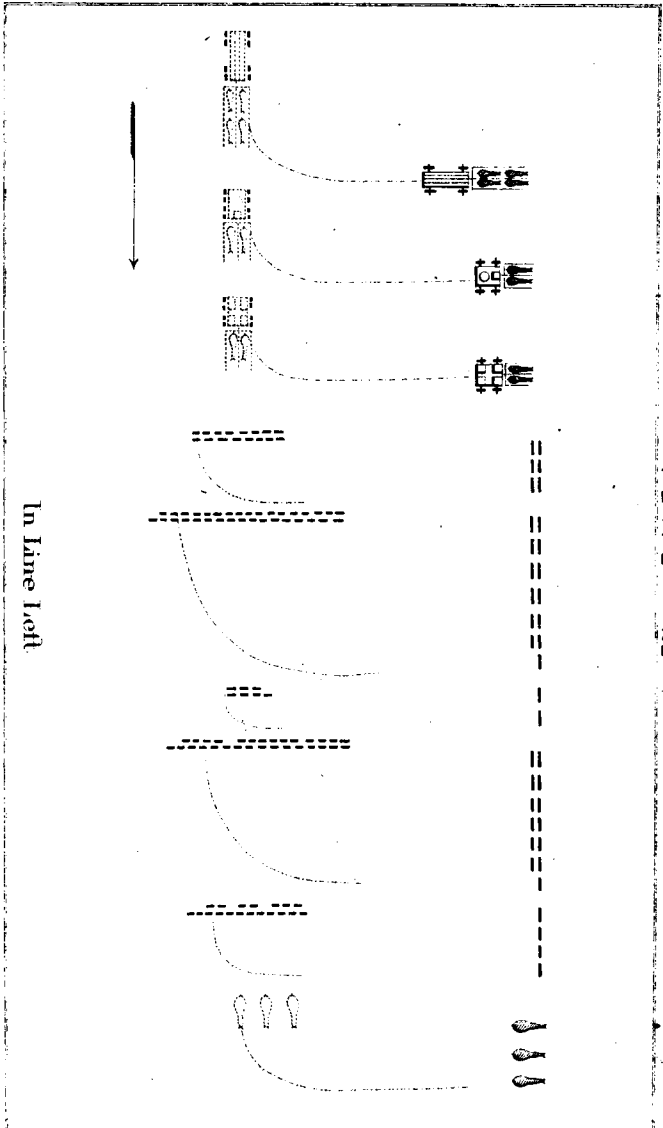
At the second command each detachment and wagon will be turned in the direction indicated, and moved forward in column without further command.

The train being in column, in order to change the march directly to the rear, the command will be given,

1. "Countermarch right (or left)".
2. "March."

At the second command the detachments and wagons halt, with the exception of the director and markers, who wheel about to the right (or left), and move toward the rear of the train, followed, in succession, by the detachments

PLATE . XL



and wagons, which wheel about in turn into their places in the moving column.

When the train is in line or in column, and it is desired to gain distance to the rear without preserving the prescribed formation, the command will be,

1. "Train right (or left) about."
2. "March."

At the second command each detachment will wheel about to the right (or left); the wagons at a trot will move to the left (or right), and then wheel to the right (or left) about, and take walk when they have their proper distance. If this command be given when the train is in line the guide will be changed when the new direction is taken.

The train being in march, and it is desired to park it in the line of direction of march, the chief of train will command,

1. "Forward into park."
2. "March."

At the first command the chief of section will command "Right oblique."

At the second command, repeated by the chief of section, the director and markers and the detachments oblique ten paces to the right, when he will command,

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

At the second command the director and the markers halt, and the detachments execute the prescribed movement; the battery-wagon obliquely to the right and moves at the command "March" to take post ten (10) paces in rear of the right of the detachment of bar-men; the wire-wagon moves to take post on line with and ten (10) paces to the left of the battery-wagon. The lance-truck moves

into position ten (10) paces to the rear and in center of the two wagons and halts.

To go into park on the left of the line of march the command will be given,

1. "Left into park."
2. "March."

At the second command the director and markers and the detachments wheel to the left, and, dressing to the right, march thirty (30) paces to the front, when they will be halted by the chief of section and aligned on the director; the wagons continue the march until the battery-wagon is opposite the detachment of bar-men, when it wheels to the left and takes post ten (10) paces in rear of the right of that detachment. The wire-wagon and lance-truck follow, and take their prescribed posts as in the usual formation. (See Plate XLI.)

To go into park on the right of the line of march the commands are,

1. "Right into park,"
2. "March;"

and they are executed by reverse movements to those prescribed for "Left into park;" but in this case the wire-wagon will pass the battery-wagon before turning to the right.

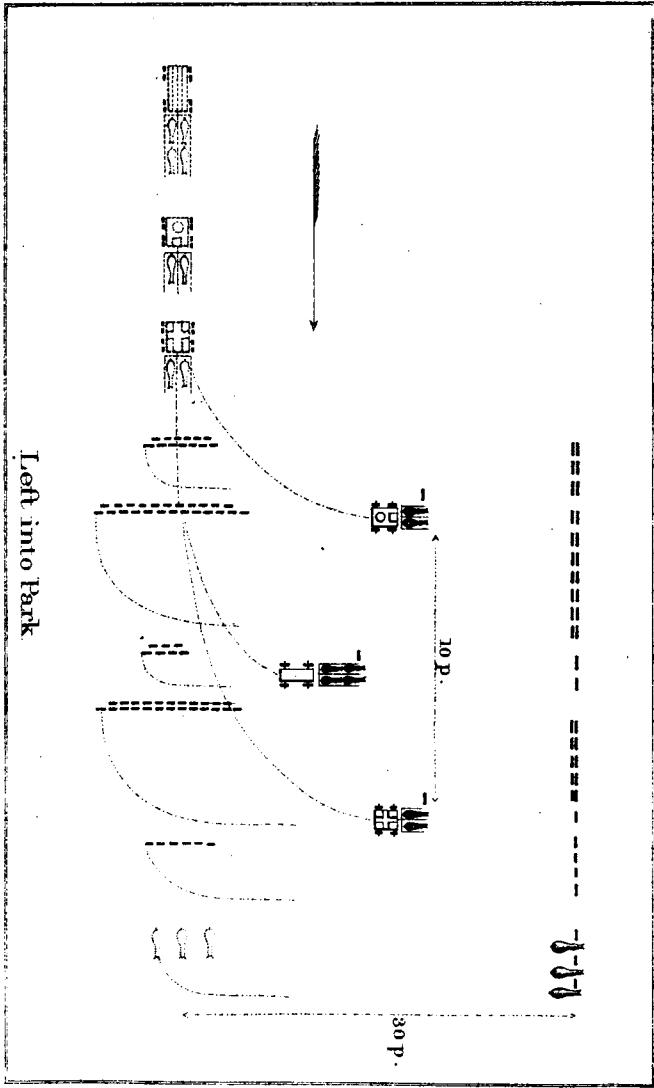
The drill being dismissed, the detachments will be marched by their respective chiefs to the parade, where they will be dismissed.

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#### GENERAL DIRECTIONS FOR RUNNING AND ERECTION OF FIELD TELEGRAPH LINES.

They should be as nearly straight as the circumstances will allow. When it is impracticable, for any reason, to fol-

PLATE XLI.



Left into Park

low a straight line, the divergence should be made with a tree, house, or other firm support, at the angle, and this, especially if the divergence is large, approaching a right angle. Should such support be unavailable, two or three lances should be set close together to divide the strain.

When following a road or highway the line should be placed beyond the ditch, so as to be entirely out of the way of trains. When crossing country the same object should be kept in view, and the line run along the edge of timber or the brink of ravines, avoiding ground likely to be selected for the parking of trains, or upon or across which artillery is likely to be moved.

In crossing broken country the surveyor should be careful to place lances upon the brink of declivities, and on the top of knolls, in order that no ground between lances shall be high enough to endanger the line, should troops or trains pass under it.

Cross roads as seldom as possible, and when necessary to do so, select, if possible, a point where the road is lower than the banks on either side.

Select ground in which the lance-holes can be easily and quickly made, but avoid sand. Lances should be fifty-three (53) steps apart; but this distance may be varied five (5) to ten (10) steps to avoid bad ground, hard clay, rock, or dry sand.

The sergeant in charge must see that the lance-holes are made of proper depth, and large enough to admit the foot of the lance easily.

The lance-men must force the lances down to the bottom of the hole, and stamp the earth about the lance to make it stand firmly; the insulator-spike must stand at right angles with the course of the line, and the insulators be all on one side of the line of polls.

The wire-men will deliver the wire from the reel only as

fast as the wagon moves, allowing no slack, in order that when lifted on the lances it shall be tight, and not hang in loose curves.

All references to insulators in the preceding drills and instructions apply to the suspender-hook insulator only. When the screw-insulator is used it is to be attached by inserting the spike in the top of the lance, and giving the insulator three (3) turns from left to right, the lance being held in the left, and the top of the insulator in the right hand of the lance-man.

In illustrative drills, if insulated wire is used, the coil of insulated wire being placed upon the reel, the wire may be very rapidly reeled out, and with the same order, and erected upon the lances passing through the insulator hooks and clamps in the same manner as the naked wire. On account of the convenience in handling, insulated wire may sometimes be used for purposes of instruction instead of the naked wire. When so used it should pass through the insulators, as before described, in order to familiarize the class with their use. When for any reason the insulator complete is not to be used, the lances may be fitted with the insulator-spikes only, and the wire attached by taking a turn with the wire around the head of the lance above the spike. The use of the spikes even may be dispensed with. To rapidly extend the line, using insulated wire, and without lances, when wagons cannot be used, the reel, bearing a coil of insulated wire, may be taken from the wire-wagon and mounted upon the "bearers," and is then carried by men; the wire paying out rapidly from the reel, is left lying upon the ground. The same mode is adopted for reeling out naked wire when the ground is such that the wire-wagon cannot be used. The wire is then placed on insulators.



## FORM FOR INSPECTION AND REVIEW OF SECTION TRAIN.

### FORM FOR REVIEW.

The train will be conducted to the ground appointed for the review by the chief of train, and formed "in line right (or left)," facing the stand of the reviewing officer, with the director and markers on the right.

The chief of train takes his place twenty (20) paces to the front and centre of the train, facing from it; the chief of section six (6) paces to the front and centre of the line of detachments.

At the approach of the reviewing officer, he is received by the chief of train by an individual salute, and the latter advances, faces the train, and commands,

1. "Prepare for review."
2. "Detachments to the rear, open order."
3. "March."

At the command "March," the director and markers and drivers dismount and stand at the heads of their horses. The chief of train and chief of section will remain mounted, if the inspector is mounted.

The chief of section, after dressing the front and rear ranks of the detachments, returns to his place in line, when the chief of train commands,

1. "Front."

The reviewing officer then advances to the chief of train, who will then accompany the reviewing officer along the front of the train from right to left, along the rear back again to the right and front, and take his post.

As soon as the reviewing officer takes his stand, the chief of train faces about and commands,

1. "Close order."
2. "March."

At the second command the ranks are closed, and the director and markers mount. The commands will then be given,

1. "To pass in review."
2. "In train, right."
3. "March."

The chief of train then takes his place three (3) paces in front of the director and markers, and conducts the column in review past the reviewing officer, the right guides or chiefs of detachments passing within six (6) paces of the latter. The chief of train leaves the head of column after saluting the reviewing officer, and remains at his side until the train passes, when he will again take charge, and, if required, pass the train again, in double time. When the train passes in double time no salutes will be given, nor will the chief of train leave the head of the column.

Having finally arrived upon the ground where the line was first established, it will again form by the command,

1. "In line, left."
2. "March."
3. "Halt."
4. "Right dress."
5. "Front."

The chief of train then takes his post and reports, saluting as before.

The change of direction in passing in review will be indicated by fixed guidons, or use of the mounted markers.

If the ceremony terminates with a review, the train is at once parked and dismissed.

#### FORM FOR INSPECTION.

If an inspection is to follow the review, the chief of train will command,

1. "Prepare for inspection."
2. "In train, right."
3. "March."
4. "Halt."
5. "Detachments, rear, open order."
6. "March."
7. "Front."

At the third command, the detachments and wagons will be wheeled to the right and move forward in column.

The fourth command will be given as soon as the wagons gain their places in column, covering as little ground as possible, when the lieutenant will take post three (3) paces in front of his section.

The chief of train takes his place six (6) paces from the head of the column. The director and markers and drivers dismount. At the sixth command, when the detachments are brought to "rear, open order," the chiefs of detachments remain at the right of the front rank of their detachments.

The inspector, accompanied by the chief of train, beginning at the head of train, regularly inspects, in succession, each detachment as to the general appearance of the men, their clothing, arms, and bearing. This inspection finished, the chief of train will command,

1. "Sling carbines" (if party is armed).
2. "Close order,"
3. "March."

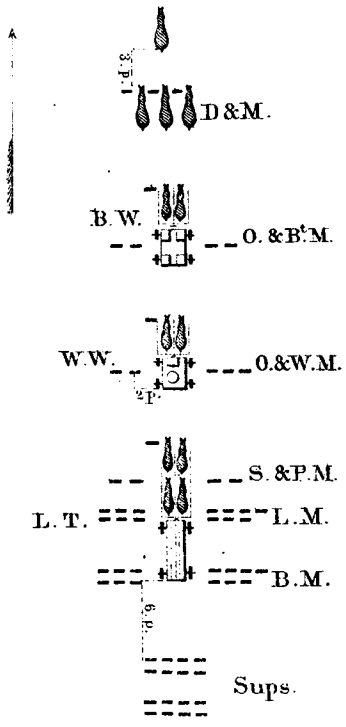
The command will then be,

1. "Take equipments."
2. "March."

At the command "Take equipments," the chiefs of detachments will cause their detachments to face about: the director and markers will stand fast. At the third command, repeated by the chiefs of detachments, the detachments will separate and move in equal divisions on either side of the train, three (3) operators and the battery-man taking position opposite the middle of, and two (2) paces outside of, the wheels of the battery-wagon, faces to the front; and three (3) operators and two wire-men take corresponding positions with reference to the wire-wagon, the operators, with the instruments in the right hand, ready for examination; the lance-men, bar-men, and pin-men on either side of the lance-truck, where they will take equipments and face to the front, each detachment two paces outside of the wheels. The director and markers take post six (6) paces in front of the lead-horses of the battery-wagon, and face to the front. (See Plate XLII.)

Surveyor and pin-men in single rank opposite the head of the wheel-horses, the bar-men with bars on the right shoulder in double rank opposite the front end of truck, the lance-men in double rank opposite the centre of rear wheels. The distance between rank of the bar-men and lance-men will be 36 inches. Supernumerary men, if any, will form in double rank, six paces in rear of the lance-truck. The men being in this position, at the approach of the inspector the chief of train commands,

1. "Attention."
2. "Inspection of train."
3. "Rear, open order."
4. "March."



At the third command, the files of the front and rear ranks of lance-men nearest to the right side of the lance-truck will mount upon it, and stand erect, ready to offer for inspection any of the appurtenances of the truck. At the last command, the rear ranks of all double ranks take ground in obedience to the order. Single ranks stand fast.

The inspector then carefully and critically examines the condition of the horses and their harness, of the wagons and their appurtenances, and the telegraphic instruments and equipments. The chief of train and chief of section must be prepared to answer minutely as to the number and condition of any of the equipments or appurtenances of the train. This inspection over, the chief of train will command (upon intimation of the inspector),

1. "Attention,"
2. "Close order,"
3. "March,"

when the ranks will be closed, the lance-men in the truck dismounting and resuming their positions in the ranks. The command will then be given,

"Return equipments,"

when equipments will be returned under the direction of the chiefs of detachments, and detachments reformed.

The command will then be,

1. "Form train, front."
2. "March."

The inspection of knapsacks will be at the quarters.