WAR DEPARTMENT

FIELD ARTILLERY FIELD MANUAL

Volume I

ORGANIZATION AND DRILL

Oct 1931

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Volume I
ORGANIZATION AND DRILL

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UNDER DIRECTION OF THE
CHIEF OF FIELD ARTILLERY
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Field Artillery Field Manual, Volume I, Organization and Drill, is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

DOUGLAS MACARTHUR,
General.
Chief of Staff.

OFFICIAL:

C. H. BRIDGES,
Major General,
The Adjutant General.

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Signal Corps Field Manual. (S. C. F. M.)

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II. *Signal Corps Operations.*

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FIELD ARTILLERY FIELD MANUAL

Volume I

ORGANIZATION AND DRILL

(The matter contained herein supersedes TR 430–75, May 23, 1923; 430–76, June 29, 1929; 430–80, May 29, 1923; 430–170, December 31, 1929)

PART ONE

GENERAL PROVISIONS

CHAPTER 1

MISSION AND FUNCTION

1. Mission of the Field Artillery.—The mission of Field Artillery is to assist the other arms, especially the Infantry and Cavalry, in combat by fire power.

2. Relation to other arms.—The basic characteristics of Field Artillery, of primary consideration in its tactical employment, are its ability to deliver a great volume of fire continuously and at a rapid rate, to fire at great depths into enemy territory, and to concentrate its fire when and where necessary. Success in battle depends largely upon mutual support of the Artillery and Infantry or other associated arm. Accordingly, there must be a mutual understanding between the Artillery and the supported arm of each other's methods of action, powers, and limitations, as well as sure and rapid means of communication not only within the Artillery itself but between the Artillery and the supported arm.

3. Employment.—Field Artillery is employed in conformity with the plan of the commander of troops, using its fire power to destroy the enemy, disorganize his command, and neutralize his fire power.

CHAPTER 2

TRAINING

4. Object.—The object of training in Field Artillery is to so confirm its personnel in the performance of habitual duties

that it may meet effectively the exacting demands of battle. This necessitates constant practice and experience in dealing with situations analogous to those to be met in war. Basically, training must be such as to develop leadership, resourcefulness, initiative, and self-reliance on the part of all personnel.

5. **Basic training.**—Thorough training of the individual soldier is the basis of efficiency. Precision and attention to detail are essential in this instruction in order that the soldier may acquire those habits of implicit obedience and accurate performance of his individual duties which are indispensable for unit efficiency.

6. **Sequence in training.**—Training will be progressive. Starting with the individual soldier, it will proceed through the successive units of command and culminate in combined maneuvers. Having gained proficiency in his particular duties and being familiar with the nomenclature and operation of the matériel with which he must work, the soldier will be trained as part of a squad or team before progressing to training with larger units.

7. **Basic elements.**—The basic elements of Field Artillery training are firing, mobility, and signal communication. They are of equal importance and must be stressed equally in training.

a. Firing.—The basis of efficiency in firing is fire discipline. Fire discipline is that condition, resulting from training and practice, which insures the orderly and efficient functioning of personnel in the delivery of fire. The basis of fire discipline is the thorough training of the individual soldier. Good fire discipline can be secured and maintained only by frequent brisk drills of short duration in which precision is stressed. Officers, having been perfected in their theoretical knowledge of artillery firing, must be trained to apply such knowledge practically.

b. Mobility.—Efficiency in mobility implies that a field artillery unit will be able to initiate and terminate a march, with all elements constantly intact, at the times designated and, upon the termination of a march, be in a condition to continue when so ordered. Efficiency in mobility is dependent upon good march discipline, requires a thorough knowledge of the means of transportation, and is developed by frequent drills and marches over varied terrain.

c. Signal communication.—Efficiency in communication is obtained by so training the personnel selected for communication

purposes that they will be able to install rapidly, maintain continuously, and utilize effectively all the means of signal communication furnished the particular field artillery unit concerned. Proficiency in communication is obtained by thorough training, both theoretical and practical, of the selected individuals and frequent exercises over varied terrain, involving different tactical situations.

8. Programs and schedules.—The daily routine training will be in accordance with prepared schedules based on programs emanating from the next higher command. The training programs of all units are based on those of the next higher unit. Programs will be progressive in nature, providing for a sequence of training beginning with the individual soldier. For each step in the sequence of training provided in a training program a training objective (the attainment of a standard of proficiency in a certain subject by a specified date) will be designated.

9. Training periods.—The length of training periods will be designated in programs and orders. In time of peace the training periods are subdivisions of the training year. In the event of mobilization for war, the length of the periods designated will depend on the time available for training purposes.

10. Recruit training.—*a.* Recruit training may be effected in the battery to which the recruit is assigned or in a special recruit organization. The method used will be influenced by the number and character of recruits and the state of training of the battery. In any event, special elementary instruction will be given in all basic subjects. The length of the recruit training period will depend upon the considerations determining the training method, as well as upon climatic conditions, availability of trained instructors and, in time of emergency, the time available for training purposes.

b. When practicable, in time of peace recruit training should be allotted a period of approximately three months, the training objective being battery drill in all its phases, including marching and camping. During the first half of the recruit training period all recruits should be given instruction mounted and dismounted without arms, dismounted with the pistol, and in physical training to include swimming, customs of the service, care of personal equipment, preparation of the equipment for marches and inspections, pitching shelter tents, personal hygiene, duties of cannoneers operating individually and as

part of the gun or howitzer squad, care of animals or motors and equipment pertaining thereto, harnessing, and guard duty. During the second half of the recruit period recruits should also be given special training in the particular duties for which they have been selected in the battery. During his period of recruit training a recruit should not, except in an emergency, be placed on rosters for daily duties such as guard, police, fatigue, etc.

11. Battery administration.—*a.* In time of peace and when the exigencies of a campaign permit, a battery commander may prescribe for the better instruction of his officers and the more efficient supervision of the administrative elements of his command, that the duties of his lieutenants be divided so that each will be in charge of one of the following departments (figs. 1, 2, and 3):

(1) Department A (executive in charge), which includes command of the firing battery, training in the service of the piece and drill of the gun squads, supervision of the battery office, supply, the recreation of the men, and the care of all wheeled matériel.

(2) Department B (assistant executive in charge), which includes training in driving and draft and supervision of the care of all animals, motor vehicles, and leather equipment of the battery.

(3) Department C (reconnaissance officer in charge), which includes training the battery commander's detail, supervision of the battery mess, and the police of the living quarters of the men.

b. Additional officers in the battery should be utilized as assistants. For purposes of instruction, officers should be rotated in their duties.

c. Each lieutenant is responsible to the battery commander for the proper performance of the work assigned. The battery commander exercises general supervision of all departments and is responsible for the proper administration and training of all elements of his battery.

d. In time of emergency the battery commander assigns his lieutenants to the departments to which they are best fitted, the special fitness of the executive being the first consideration.

12. Training for higher command.—Personnel should be trained to think quickly and logically and to assume responsibilities unhesitatingly. Officers and noncommissioned officers

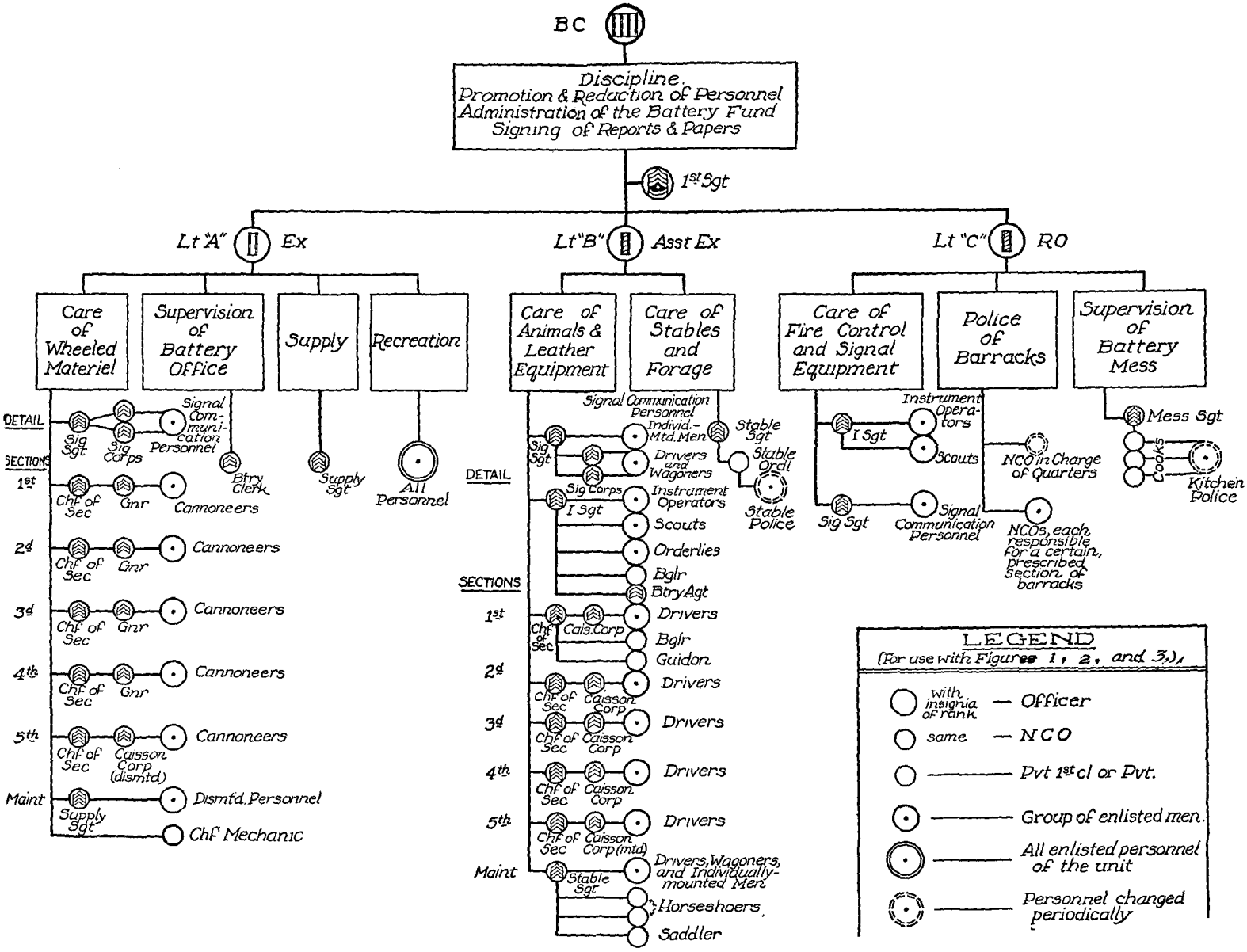


FIGURE 1.—Organization of a battery for administration (75-mm. gun regiment, horse-drawn)

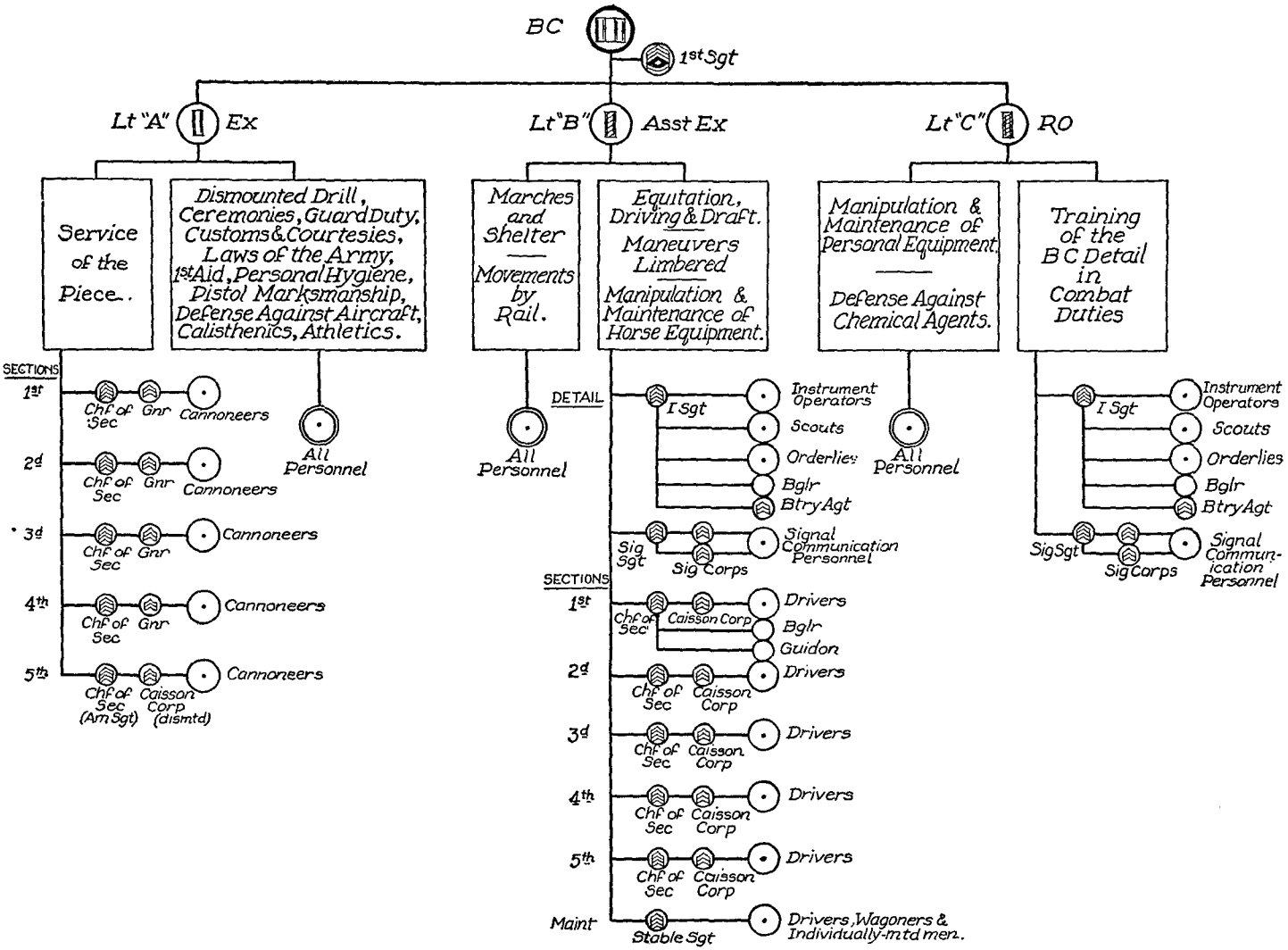


FIGURE 2.—Organization of a battery for purposes of training (75-mm. gun regiment, horse-drawn). (For explanation of symbols, see fig. 1)

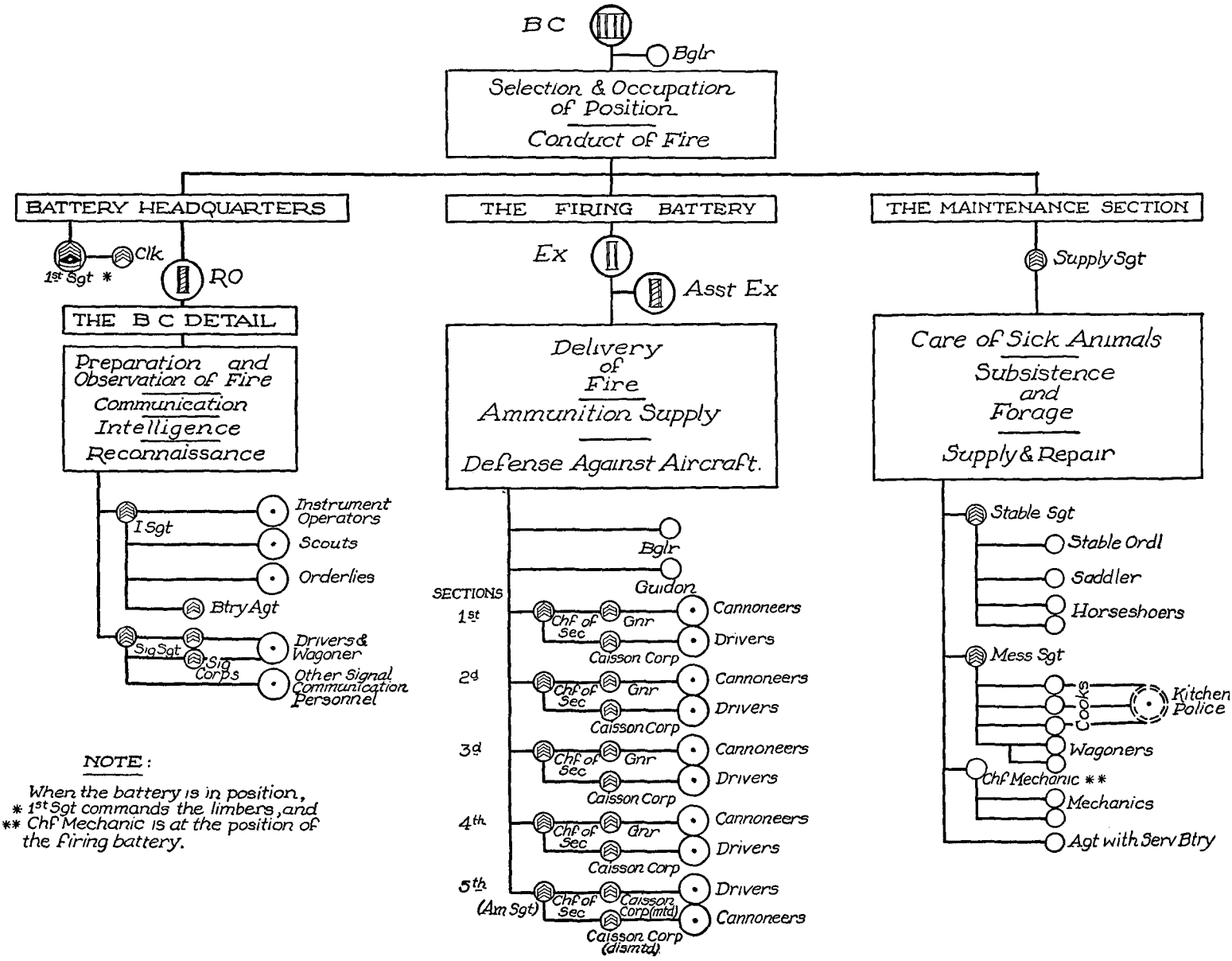


FIGURE 3.—Organization of a battery for combat (75-mm. gun regiment, horse-drawn). (For explanation of symbols, see fig. 1)

will be trained in the duties of the next higher grade in order that replacements may be made on the field of battle without detriment to the command.

PART TWO

ORGANIZATION AND EQUIPMENT

CHAPTER 1

ORGANIZATION

13. General.—*a.* As the measure of efficiency of Field Artillery is the effective employment of its armament in battle, the organization of the Field Artillery is based on developing the maximum efficiency in fire power, mobility, and signal communication, as well as effective command and administration.

b. For command and administrative purposes, Field Artillery is organized into batteries, battalions, regiments and brigades, and, for ammunition supply purposes, into battalion combat trains and ammunition trains. A tabulation of Field Artillery organization (with major items of equipment) is given in Tables I, II, and III. The details of organization are given in appropriate Tables of Organization.

14. Classification.—Field Artillery is classified as follows:

a. Based on tactical employment.—(1) Division artillery, corps artillery, army artillery, and GHQ (general headquarters) reserve artillery.

(2) The term *army artillery,* and similarly *corps artillery,* does not include the organic artillery (artillery shown as part of a unit by Tables of Organization) of subordinate units. To refer to all the artillery in an army or in a corps, the expression *artillery with the ——— army,* or *artillery with the ——— corps* is used.

b. Based on weight or caliber (table, par. 28).—Light artillery, medium artillery, and heavy artillery. Light artillery includes all guns and howitzers of 105-mm. or smaller caliber; medium artillery, the 155-mm. howitzer; heavy artillery, the 155-mm. and 6-inch guns and all guns and howitzers of larger caliber.

c. Based on means of transportation.—Horse-drawn artillery, horse artillery, pack artillery, portée artillery, and tractor-drawn artillery.

d. Specially classified.—Organizations of trench mortars assigned to the Field Artillery are classified under the generic designation, trench artillery.

15. Division artillery (Tables I and III).—*a.* An infantry division includes two infantry brigades, a field artillery brigade, and engineer, signal, medical, and other special troops. The organic field artillery brigade of an infantry division consists of a brigade headquarters and headquarters battery, two regiments of 75-mm. guns, one regiment of 155-mm. howitzers, and an ammunition train.

b. A cavalry division includes two brigades of cavalry, a regiment of horse artillery (75-mm. guns) and special troops.

c. The artillery of a division comprises all the artillery placed under the command of a division commander, including the organic artillery of the division, if present, and such units from other divisions, from the corps artillery or from the GHQ reserve artillery as may be attached.

16. Corps artillery (Table II).—*a.* The corps artillery consists of a corps artillery headquarters, an organic corps artillery brigade, a regiment of antiaircraft artillery (motorized), and such artillery units from the GHQ reserve artillery as may be attached to a corps by the army and not attached to divisions by the corps. Such artillery as is attached to a corps, and not attached to divisions, may be attached to the organic corps artillery brigade or may function under the corps chief of artillery as one or more distinct tactical units.

(1) An organic corps artillery brigade includes a brigade headquarters and headquarters battery, 2 regiments of 155-mm. howitzers, one regiment of 155-mm. guns, 1 observation battalion, 1 ammunition train, and 1 attached ordnance company (maintenance).

(2) A corps artillery headquarters consists of a corps chief of artillery, his staff, and other headquarters personnel.

b. In a cavalry corps, the corps artillery consists of a corps artillery headquarters (same as the artillery brigade headquarters and headquarters battery of an infantry division) and such artillery as may be attached by the higher command from GHQ reserve artillery. According to circumstances, a part or all of the following units may be attached: One regiment of 105-mm. howitzers (horse-drawn); two regiments of 75-mm. howitzers (pack); such portée and tractor-drawn artillery (75-mm. gun) and antiaircraft artillery (motorized) as may be required.

TABLE I.—*Field artillery brigade, infantry division (war strength), and major items of equipment*

(These tables are furnished primarily as a guide. In any discrepancy, T/O's and T/BA's will govern)

	Units	Officers	Warrant officers	Enlisted men	Animals	Guns or howitzer	Caissons	Tractors, light or medium	Machine guns	Trailers, machine guns	Carts, ration and water (4h) or trailers, water	Kitchens, rolling (4h) or trailers, kitchen	Wagons: Battery and store (6h)	Wagons: Mountain (4h)	Wagons: Escort (4m)	Battery reels (4h)	Battalion reels and carts (6h) or trailer, reel and cart	Trucks: Light utility or light	Trucks: Light repair	Trucks: Medium	Cars: Passenger	Cars: Omnibus	Cars: Side (MC)	Ambulances, motor	Fire-control instruments: Aiming circles	Fire-control instruments: B. C. telescopes	Fire-control instruments: Range finders	Signal equipment: Wire, miles: Outpost	Signal equipment: Wire, miles: Field	Signal equipment: Radio sets	Signal equipment: Panel sets	Signal equipment: Signal lamps	Signal equipment: Reels, breast	Signal equipment: Reels, pack	Signal equipment: Switchboards	Signal equipment: Telephones	Engineer equipment: Plane tables	Engineer equipment: Alidades	Engineer equipment: Instruments, drawing, sets	Ammunition: 75-mm.	Ammunition: 155-mm.
75-mm. gun, horse-drawn (Table of Organization, September, 1931)																																							
Battery:																																							
Headquarters	1	2		33	36									1		2									1	1	1	1	5			3	4		2	7	1	1			
Firing battery—																																							
4 gun sections	4	2		74	62	4	4		2																1													568	
Fifth section	1			15	14		2																															214	
Maintenance section	1			26	26						[a] 1	1	1																										
Totals in 1 battery		4		148	138	4	6		2		1	1	1	1		2									2	1	1	1	5			3	4		2	7	1	1		782	
Battalion:																																							
Headquarters and headquarters battery	1	10		88	113						[a] 1	1		2			2						2		2	1	1	2	16	3	1	4	4	2	3	18	1	1	1		
Combat train—																																							
Train headquarters	1	1		9	10									1									2																
Platoons	3	2		110	130		18																															1,926	
Maintenance section	1			29	25				2		[a] 1	1	1																										
Batteries	3	12		444	414	12	18		6		3	3	3	3		6									6	3	3	3	15			9	12		6	21	3	3		2,346	
Totals in 1 battalion		25		680	692	12	36		8		5	5	4	6		6	2						4		8	4	4	5	31	3	1	13	16	2	9	39	4	4	1	4,272	
Regiment:																																							
Headquarters and headquarters battery	1	[b] 12	[c] 1	[28c] 105	98						[a] 1	1		2			2				1	1	2		1	1	1	2	10	3	1	4	4		3	16	1	1	1		
Service battery—																																							
Regimental section	1	3		49	78						[a] 1	1			12			1					2																
Battalion sections	2	2		56	100				2						22																								
Battalions	2	50		1,360	1,384	24	72		16		10	10	8	12		12	4						8		16	8	8	10	62	6	2	26	32	4	18	78	8	8	2	8,544	
Medical	1	9		52	62									2	1								1																
Totals in 1 regiment		76	1	1,622	1,722	24	72		18		12	12	8	16	35	12	6	1			1	1	13		17	9	9	12	72	9	3	30	36	4	21	94	9	9	3	8,544	
155-mm. howitzer, motorized																																							
Battery:																																							
Headquarters	1	2		35				1									[e] 2	1			2	1			1	1	1	1	10			3	4		2	7	1	2	1		
Firing battery—																																							
4 howitzer sections	4	2		78		4	8	8														2			1													112	
Fifth section	1			20			4	3	2	1																												56	
Maintenance section	1			30				2			1	1							1	5	1																		
Totals in 1 battery		4		163		4	12	14	2	1	1	1					[e] 2	1	1	5	3	3			2	1	1	1	10			3	4		2	7	1	2	1		168
Battalion:																																							
Headquarters and headquarters battery	1	9		61				1			1	1					[e] 2	2		2	4	3			2	1		2	12	1	1	4	4		3	18	1	2	1		
Combat train—																																							
Train headquarters	1	1		7																	2																		
Platoons	2	2		96																24																		960	
Maintenance section	1			23					2		1	1							1	4																			
Batteries	2	8		326		8	24	28	4	2	2	2					[e] 4	2	2	10	6	6			4	2	2	2	26			6	8		4	14	2	4	2		336
Totals in 1 battalion		20		513		8	24	29	6	2	4	4					[e] 6	4	3	40	12	9			6	3	2	4	32	1	1	10	12		7	32	3	6	3		1,296
Regiment:																																							
Headquarters and headquarters battery	1	[b] 12	[c] 1	[28c] 109				1			1	1					[e] 2	2	1	3	6	4			2	1		2	14	2	1	4	4		3	16	1	2	1		
Service battery—																																							
Regimental section	1	3		49					2		1	1						1	1	9	3																		
Battalion sections	3	3		60																18																		
Battalions	3	60		1,539		24	72	87	18	6	12	12					[e] 18	12	9	120	36	27			18	9	6	12	96	3	3	30	36		21	96	9	18	9		3,888
Medical	1	6		40														4			2			3															
Totals in 1 regiment		84	1	1,797		24	72	88	20	6	14	14					[e] 20	19	11	150	47	31		3	20	10	6	14	110	5	4	34	40		24	112	10	20	10		3,888
Brigade																																							
Headquarters	1	10																																					
Headquarters battery	1	2		91	30			2			1	1					2	3		3	6	2	4					1	15	3	1		2		3	16			[d] 1		
Ammunition train:																																							
Headquarters and headquarters battery	1	6		63					2		1	1						3	1	3	1		5																
Ammunition battery, truck	2	6		236					6		2	2							2	58	2		8															2,400	1,440
Ammunition battery, wagon	1	3		116	147				3			1			28								2															2,400	
Medical	1	1		9														1						1															
Regiments, 75-mm. gun	2	152	2	3,244	3,444	48	144		36		24	24	16	32	70	24	12	2			2	2	26		34	18	18	24	144	18	6	60	72	8	42	188	18	18	6	17,088	
Regiment, 155-mm. howitzer	1	84	1	1,797		24	72	88	20	6	14	14					[e] 20	19	11	150	47	31		3	20	10	6	14	110	5	4	34	40		24	112	10	20	10		3,888
Totals in brigade		264	3	5,556	3,621	72	216	90	67	6	[24a] 42	43	16	32	98	24	[10e] 34	28	14	214	58	35	45	4	54	28	24	39	269	26	11	94	114	8	69	316	28	38	[1d] 17	21,888	5,328

[a] Until available one escort wagon will be issued in lieu thereof.
[b] Includes 1 chaplain.
[c] Band.
[d] Drafting equipment.
[e] 2 reels and 1 cart.

Automatic rifles not listed, assignment still in experimental status.

TABLE II.—*Field artillery brigade, corps (war strength), and major items of equipment*

(These tables are furnished primarily as a guide. In any discrepancy, T/O's and T/BA's will govern)

	Units	Officers	Warrant officers	Enlisted men	Guns or howitzers	Caissons	Machine guns	Reels, trailer	Carts (reel)	Trailers				Tractors		Trucks						Ambulances, motor	Cars			Fire-control			Signal								Engineer				Ammunition (f)	
										Machine gun	Equipment	Kitchen	Water	Medium	Heavy	Light utility	Ordnance	Light repair	Sound ranging	Light	Medium		Passenger	Omnibus	Side (M C)	Aiming circles	B.C. telescopes	Range finders	Wire, miles: Outpost	Wire, miles: Field	Radio sets	Panel sets	Lamps, signal	Reel, breast	Switchboards	Telephones	Plane table	Alidade	Drafting equipment	Instruments, drawing, sets	155-mm. howitzer	155-mm. gun
155-mm. (GPF) or 6-inch gun (Tables of Organization, July, 1930)																																								
Battery:																																								
Battery headquarters	1	2		34				2	1						1	1							1	1	3	1	3		2	16			3	4	2	11	2	3		1		
Firing battery—																																								
4-gun sections	4	2		86	4						4				8											1														[e] 64
Fifth section	1			17			2				1				1																									
Maintenance section	1			28								1	2		2				1			5																	
Totals in one battery		4		165	4		2	2	1		5	1	2		12	1			1			5		1	1	3	2	3		2	16			3	4	2	11	2	3		1		
Battalion:																																								
Headquarters and headquarters battery	1	8		66				2	1			1	1		1	2						2		2	2	4	2	1		2	16	1	1	4	4	3	18	1	2		1		
Combat train—																																								
Train headquarters	1	1		7			2																	1		1															
Ammunition sections	2	2		54																		12																	480
Maintenance section	1			28								1	1						1			4				2													
Batteries	2	8		330	8		4	4	2		10	2	4		24	2			2			10		2	2	6	4	6		4	32			6	8	4	22	4	6		2		128
Totals in one battalion		19		485	8		6	6	3		10	4	6		25	4			3			28		5	4	13	6	7		6	48	1	1	10	12	7	40	5	8		3		608
Regiment:																																								
Headquarters battery	1	[b] 13	[a] 1	[18a] 116				2	1			1	1		1	2		1				3		3	3	5	2	1		2	16	2	1	4	4	3	16	1	2		1		
Service battery—																																								
Regimental section	1	2		57			2					1	1			1		1				10		1		2														
Battalion sections	3	6		75																		18				3														
Battalions	3	57		1,455	24		18	18	9		30	12	18		75	12			9			84		15	12	39	18	21		18	144	3	3	30	36	21	120	15	24		9		1,824
Medical	1	6		40												4							3	1		1														
Totals in one regiment		84	1	1,743	24		20	20	10		30	14	20		76	19		11				115	3	20	15	50	20	22		20	160	5	4	34	40	24	136	16	26		10		1,824
Ammunition train (T/O, September, 1931)																																								
Headquarters and headquarters battery	1	6		63			2					1	1			3		1				3		1		5														
Ammunition batteries	5	15		590			15					5	5					5				145		5		20													3,024	1,776
Medical	1	3		21												2							1			2														
Sound and flash battalion (Tables of Organization, 1931)																																								
Battery:																																								
Battery headquarters	1	2		12																				1	1	2											4	5	1			
Platoon—																																								
Flash	1	2		59															1	1				2	6			[d] 8												
Sound	1	2		43															1	1				2	3															
Communication	1	1		49			2	4			4			[c] 2								4				2									[2d] 3	16					
Maintenance section	1			13			1					1	1					1				2				1														
Totals in one battery		7		176			3	4			4	1	1	[c] 2				1	2	2		6		5	10	5		[d] 8							[2d] 3	16	4	5	1			
Battalion:																																								
Headquarters and headquarters battery	1	7		62				2			2	1	1	[c] 1		2					1	4		1	2	4		[d]			12	1	1	4	2	3	8	1	1		1		
Batteries	2	14		352			6	8			8	2	2	[c] 4							4	12		10	20	10		[d] 16			100				[4d] 6	32	8	10	2			
Medical	1	1		4												1										1														
Totals in one battalion		22		418			6	10			10	3	3	[c] 5		3			4	5		16		11	22	15		[d] 16			112	1	1	4	2	[4d] 9	40	9	11	2	1		
Brigade																																								
Headquarters and headquarters battery [e] (T/O, September, 1931)	1	12		91				2	2			1	1		2						3	3		6	2	4				1	30	1	1		2	3	16			1			
Regiments, 155-mm. howitzer (see fig. 4)	2	168	2	3,594	48	144	40	40	20	12		28	28	176		38		22			3	300	6	94	62		40	20	12	28	220	10	8	68	80	48	224	20	40		20	7,776	
Regiments, 155-mm. or 6-inch gun	1	84	1	1,743	24		20	20	10		30	14	20		76	19		11				115	3	20	15	50	20	22		20	160	5	4	34	40	24	136	16	26		10		1,824
Ammunition train	1	24		674			17					6	6			5		6				148	1	6		27														3,024	1,776
Sound and flash battalion	1	22		418			6	10			10	3	3	[c] 5		3			4	5		16		11	22	15		[d] 16			112	1	1	4	2	[4d] 9	40	9	11	2	1		
Ordnance company (maintenance) (T/O, July, 1930)	1	7		138							1	1	2	1							6	4		3																
Totals in brigade		317	3	6,658	72	144	83	72	32	12	41	53	60	[5c] 184	76	65	6	43	4	8	[13d] 598	10	140	101	96	60	[16d] 58	12	49	522	17	14	106	124	[4d] 84	416	45	77	3	31	10,800	3,600

[a] Band.
[b] 1 chaplain.
[c] Light.
[d] *Special type.*
[e] 30 horses riding in brigade headquarters battery.
[f] The corps Q. M. C. train carries one-half day of fire for all artillery with the corps. For a type corps this will include the following field artillery ammunition: 21,600 rounds, 75-mm. gun, 9,000 rounds, 155-mm. howitzer, 1,200 rounds, 155-mm. gun, a load for 363 3-ton trucks.
[g] 16 rounds per gun carried on trailer.

Automatic rifles not listed, assignment still in experimental status.

TABLE III.—*GHQ reserve artillery and special types of artillery (war strength), and major items of equipment*

(These tables are furnished primarily as a guide. In any discrepancy, T/O's and T/BA's will govern)

	Units	Officers	Warrant officers	Enlisted men	Guns or howitzers	Caissons	Machine guns, AA	Trailers						Trucks				Cars			Ambulances	Escort wagons	Animals	Tractors			Transport wagons	Fire control			Signal								Engineer						Ammunition
								Equipment	Light	Kitchen	Water	Reel	Cart (reel)	Light utility	Light	Medium	Light repair	Passenger	Omnibus	Side (MC)				Light	Medium	Heavy		Aiming circles	B. C. telescopes	Range finders	Wire		Radio sets	Panel sets	Signal lamps	Breast reels	Switch boards	Telephones	Drawing boards	Plane tables	Alidades	Transits	Drafting equipment	Instruments, drawing, sets	
																														Outpost	Field												
Brigade LFA, motorized [a]																																											
Brigade headquarters and headquarters battery (T/O September, 1931)	1	12		91						1	1	2	2		3	3		6	2	4			30	2				51	27	27	1	15	3	1		2	3	16					1	
Regiments [b] (T/O December, 1921)	3	207	[d] 3	[84d] 3,537	72	144	36	90	18	30	30			21		84	21	42	39	93	6				234			51	27	27	36	216	27	9	90	108	63	282		27	27			9	10,080
1 battery		5		133	4	8	2	5	1	1	1					1	1	1	1	2					13			2	1	1	1	5		3	4	2	7		1	1				560
1 battalion		23		460	12	24	6	15	3	4	4			1		3	3	5	5	10					39			8	4	4	5	31	3	1	13	16	9	39		4	4			1	1,680
Totals in 1 brigade [b]		219	[d] 3	[84d] 3,628	72	144	36	90	18	31	31	2	2	21	3	87	21	48	41	97	6		30	2	234			51	27	27	37	231	30	10	90	110	66	298		27	27		1	9	10,080
Brigade LFA, portée [a]																																											
Brigade headquarters and headquarters battery (T/O September, 1931)	1	12		91						1	1	2	2		3	3		6	2	4			30	2							1	15	3	1		2	3	16					1	
Regiments [b] (T/O June, 1921)	3	207		2,547	72		36			24	24			18		216	3	42	30	93	6			18				51	27	27	36	216	27	9	90	108	63	282		27	27			9	4,320
1 battery		5		97	4		2			1	1					8		1	1	2				1				2	1	1	1	5		3	4	2	7		1	1				240
1 battalion		23		341	12		6			3	3			1		27		5	4	10				3				8	4	4	5	31	3	1	13	16	9	39		4	4			1	720
Totals in brigade [b]		219		2,638	72		36			25	25	2	2	18	3	219	3	48	32	97	6		30	20				51	27	27	37	231	30	10	90	110	66	298		27	27		1	9	4,320
Brigade HFA, motorized																																											
Brigade headquarters and headquarters battery (T/O September, 1931)	1	12		91						1	1	2	2		3	3		6	2	4			30	2							1	30		1		2	3	16					1	
Regiments, 155-mm. or 6-inch guns [b] (T/O July, 1930)	3	252	[d] 3	[84d] 5,229	72		60	90		42	60	60	30	57		345	33	60	45	150	9					228		60	66		60	480	15	12	102	120	72	408	12	48	78	12		30	5,472
Regiments, 240-mm. howitzers [b] (T/O November, 1921)	2	192	[d] 2	[86d] 4,768	48		24	108		28	40	40	20	38		418	22	40	30	160	6					296	192	20	16		40	320	10	8	68	80	48	272	8	32	52	8		20	2,016
1 battery (240-mm. howitzer)		6		249	4		2	9		1	2	2	1	1		17	1	1	1	6						24	16	2	2		2	16			3	4	2	11		2	3			1	80
1 battalion (240-mm. howitzers)		23		691	8		4	18		4	6	6	3	4		57	3	5	4	21						49	32	6	5		6	48	1	1	10	12	7	40	1	5	8	1		3	336
Sound and flash battalion [b] (T/O, 1931)	1	22		418			6	10		3	3	10		3	[4c] 9	16		11	22	15									[c] 16			112	1	1	4	2	[4c] 9	40	1	9	11	8	2	1	
Ordnance company (heavy maintenance) [b] (T/O May, 1931)	1	11		294				[24c] 26		2				4	[c] 2	[53c] 61	4			8				5																					
Totals in 1 brigade [b]		489	[d] 5	[189d] 10,800	120		90	[24c] 234		76	104	112	52	102	[6c] 14	[53c] 843	59	117	99	337	15		30	7		524	192	80	[16c] 98		101	943	27	22	174	204	[4c] 132	736	21	89	141	28	3	51	{5,472–155 G 2,016–240H
Regiment, 75-mm. howitzer, pack [e]																																											
Headquarters and headquarters battery	1																																										
Service battery	1																																										
Battalions	2																																										
1 battery																																											
Medical	1																																										
Totals in 1 regiment																																											
Regiment, 75-mm. gun, [e] *horse (cavalry division)*																																											
Headquarters and headquarters battery	1																																										
Service battery	1																																										
Battalions	2																																										
1 battery																																											
Medical	1																																										
Totals in 1 regiment																																											

[a] Organization similar to LFA of infantry division; battalions have no combat trains.
[b] Includes medical personnel and chaplains.
[c] Special type.
[d] Bands.
[e] Table of Organization for these regiments still under preparation.

Automatic rifles not listed, assignment still in experimental status.

17. Army artillery.—*a.* The army artillery consists of an army artillery headquarters, an ammunition train, a brigade of antiaircraft artillery and such artillery units as are attached to the army by GHQ and retained under army control. An army artillery headquarters consists of an army chief of artillery, his staff, and other headquarters personnel.

b. Certain situations may render it advisable to retain, as army artillery, units of the GHQ reserve artillery attached to the army. Commanders and staffs for artillery so retained are obtained from the GHQ reserve.

18. GHQ artillery (Table III).—*a.* The GHQ reserve artillery includes all artillery not an organic part of divisions, corps, and armies which comes under the control of the commander of the field forces. The units comprising the GHQ reserve artillery may include all types and calibers, and are determined in accordance with the requirements of the situation. For purposes of mobilization, the artillery of the GHQ reserve has been fixed as indicated below.

Prorata for one army on mobilization

One brigade of light field artillery (tractor-drawn).
One brigade of light field artillery (portée).
One brigade of heavy artillery.

Prorata for six armies on mobilization

Six times that of one army, *plus*—
One regiment 6-inch trench mortars.
One regiment 12-inch railway guns.
One regiment 16-inch (or 14-inch) railway guns.

Other types of artillery allotted organically to GHQ reserve

Pack artillery.

b. Units of the GHQ reserve artillery allotted to the army may be allotted in turn to the corps. The corps retains those units necessary for carrying out its missions and reallots the remainder to divisions. Light artillery units, retained by the corps for strategic purposes, are as a rule subsequently attached to divisions for employment.

19. Command.—*a. General.*—(1) There is no direct chain of artillery command extending from armies to corps or from corps to divisions. Control by a chief of artillery is exercised

through the normal chain of command; thus, instructions originating with an army chief of artillery for the corps artillery will be directed in the name of the army commander to the corps commander, who will be responsible for issuing appropriate orders to his artillery commander; similarly, for corps and division.

(2) A chief of artillery of a unit (in a division, the division artillery commander) is charged with both command and staff functions. He commands all the artillery, both organic and attached, which has been assigned to the unit and is not allotted to subordinate units. Thus the corps chief of artillery commands the corps artillery which is under the direct orders of the corps commander, but he does not command the division artillery. As a member of the special staff of the unit, the chief of artillery (in the division, the division artillery commander) is the immediate assistant of the commander and his adviser on all matters pertaining to the artillery with the unit.

b. The chief of artillery, GHQ.—The chief of artillery, GHQ, is a member of the special staff of the commander in chief, and commands the GHQ reserve artillery not allotted to armies.

c. The chief of artillery, group of armies.—Organically, the group of armies has no chief of artillery. When it is part of a larger field force a general officer, normally from the GHQ reserve artillery, is attached as artillery adviser on the staff of the army group commander. Where a group of armies is operating in a separate theater or overseas it will be necessary to appoint a chief of artillery of the force whose duties are analogous to those of the chief of artillery, GHQ.

d. The army chief of artillery.—The army chief of artillery is a member of the special staff of the army commander and the tactical commander of the army artillery.

e. The corps chief of artillery.—The corps chief of artillery is a member of the special staff of the corps commander and, in addition, is the tactical commander of the corps artillery. At no time does he exercise either administrative or tactical command of the division artillery; in his relations therewith he acts as a staff officer of the corps commander.

f. The division artillery commander.—When the division is supported by its organic artillery only, the commander of this artillery is the division artillery commander. When other artillery is attached, the senior officer of the division artillery

(organic or attached) is the division artillery commander by virtue of rank. It may be desirable to have the commander of the organic division artillery, regardless of grade, command all the division artillery. To accomplish this the division commander should make special arrangements consistent with seniority.

20. Staffs.—*a. General.*—(1) The purpose of artillery staffs is to assist commanders in formulating and carrying out their decisions and to assist the troops in the performance of their missions.

(2) Staff officers have no authority to command, and all orders issued by them must be in the name of, or authorized by, their respective commanders. The issuance of orders through the normal chain of command is imperative.

(3) In large units (army, corps, and division) there are two general divisions of the staff, one the general staff group and the other the special staff group (technical, supply, and administration staff). The general staff group is composed of four divisions: G–1 (personnel), G–2 (intelligence), G–3 (operations and training), and G–4 (supply).

(4) In brigades and smaller units the division of staff duties is as outlined for large units, but the divisions are designated S–1, S–2, etc. These designations are used in all field artillery staffs. In view of the limited size of the staffs of some of the smaller units, several staff duties may be charged to one officer.

(5) To insure coordinated action of a staff, there is an executive or chief of staff.

(6) The organization of the various staffs in the Field Artillery is given in appropriate Tables of Organization and in the Staff Officers' Field Manual. Organization and duties of the battalion, regiment, and brigade staffs are given in Field Artillery Field Manual, Volume II.

b. Unit staffs.—(1) *Battalion.*—The battalion staff consists of a major or captain (executive) and an appropriate number of captains and lieutenants.

(2) *Regiment.*—The regimental staff includes a lieutenant colonel (executive), an appropriate number of captains and lieutenants of Field Artillery, a chaplain, and a medical officer.

(3) *Brigade.*—The brigade staff includes a lieutenant colonel (executive), two aides, and an appropriate number of officers in the grades of major, captain, and lieutenant. In a division

field artillery brigade the staff acts to assist the brigade commander in his duties as artillery adviser to the division commander and tactical commander of the brigade.

(4) *Corps.*—The staff of the corps chief of artillery includes a colonel (chief of staff), two aides, and an appropriate number of other officers.

(5) *Army.*—The staff of the army chief of artillery includes a colonel (chief of staff), three aides, and an appropriate number of other officers.

21. The battery.—Batteries, the smallest administrative units in the Field Artillery, are also tactical units. They are designated, depending on their special functions, as headquarters and headquarters batteries; gun, howitzer, or mortar batteries; service batteries; ammunition batteries; and sound and flash batteries. Considered administratively, battalion combat trains are analogous to batteries.

a. Headquarters and headquarters batteries.—A headquarters and headquarters battery is assigned organically to each brigade, regiment, and battalion of Field Artillery. Differing in detail as to organization, depending on the functions of the unit to which assigned, a headquarters and headquarters battery is organized for purposes of command, intelligence, reconnaissance, observation, signal communication, liaison, fire direction, and supervision of supply.

b. Gun, howitzer, and mortar batteries.—Gun, howitzer, and mortar batteries are organized primarily for the delivery of fire. Each is equipped with pieces of like type and caliber and has personnel and equipment necessary for maneuver, signal communication, and the delivery of fire. Gun and howitzer batteries normally operate as part of a battalion. The principal subdivisions are:

(1) *Battery headquarters.*—This includes the battery commander's detail, and the first sergeant and battery clerk, who assist the battery commander in matters relating to administration.

(2) *The firing battery.*—This element of a battery is charged with executing the fire missions. It is organized into four gun or howitzer sections and, in certain types of batteries, a caisson (ammunition) section. In horse-drawn light artillery, a gun (howitzer) section consists of a gun (howitzer) and its caisson, manned and equipped; a caisson section consists of two caissons manned and equipped. In medium artillery a gun (howitzer)

section consists of a gun (howitzer) and two caissons; a caisson section consists of four caissons and a machine-gun trailer. In heavy field artillery, caisson sections are replaced by ammunition sections. Each gun (howitzer) section is divided as is appropriate into squads; the section is commanded by a sergeant, chief of section. A gun squad is commanded by a gunner (corporal); a caisson (ammunition) squad by a caisson (ammunition) corporal. In general a battery consists of three platoons, two of which are gun (howitzer) platoons, each consisting of two gun (howitzer) sections. The third platoon comprises the ammunition and maintenance sections. A trench artillery battery has six mortar sections, each armed with one mortar.

(3) *Maintenance section.*—This section is organized to assist the battery commander in matters pertaining to maintenance and supply. It consists, in gun and howitzer batteries, of the kitchen and the supply and repair vehicles, all manned and equipped, and an agent charged with maintaining contact between the battery and the service battery. Included in the personnel of this section are the supply sergeant, the stable or motor sergeant, the mess sergeant, the battery mechanics, and the cooks. The supply sergeant commands the section and is responsible for drawing and issuing clothing and equipment, for the repair and replacement of matériel, and for the keeping of appropriate records. The battery clerk, with the battery records, accompanies this section in the field. In mortar batteries, a train section is provided which corresponds to the maintenance section of gun and howitzer batteries. The train section includes also antiaircraft machine-gun trailers and the trucks for the transportation of the matériel and personnel.

c. Service batteries.—Organically a part of a regiment of Field Artillery, a service battery is organized for the supply and baggage transport of the regiment. The battery is subdivided into a regimental section and two or more battalion sections, depending on the number of battalions in the regiment. The organization is such that the battalion sections can be detached when appropriate for service with their respective battalions.

d. Ammunition batteries (truck, wagon).—An ammunition battery is organically a part of an ammunition train, organized for the transport and service of ammunition. The distinction between an ammunition battery (truck) and an ammunition

battery (wagon) lies in the means of transport, the former being motorized, the latter animal drawn. Ammunition batteries are organized and assigned as indicated in appropriate Tables of Organization.

e. Sound and flash batteries.—Organized into sections as indicated in appropriate Tables of Organization, a sound and flash battery functions both as a sound and a flash ranging unit. (TR 430-130.)

22. The battalion (Tables I, II, and III).—*a. Gun or howitzer battalion.*—The battalion consists of a headquarters and headquarters battery; a battalion combat train, except in certain GHQ reserve artillery units, and either three batteries, as in the light artillery, or two batteries, as in the medium and heavy artillery. The battalion is primarily a tactical unit.

b. Trench artillery battalions.—Trench artillery battalions are organized similarly to medium artillery battalions, except that they have no combat trains.

c. Sound and flash battalions.—A sound and flash battalion, consisting of a headquarters and headquarters battery and two sound and flash batteries, is assigned organically to a corps field artillery brigade and to each brigade of heavy artillery in the GHQ reserve.

d. Battalion combat trains.—(1) Organically part of a battalion, a battalion combat train is organized for the purpose of furnishing a mobile reserve of ammunition for the batteries and a means of transporting ammunition from an ammunition distributing point to the batteries.

(2) The principal subdivisions of a battalion combat train are train headquarters, ammunition sections, and a maintenance section. The ammunition sections are usually organized into platoons for attachment to detached batteries, the number of platoons corresponding to the number of batteries in the battalion.

(3) In time of peace the battalion combat train is combined with battalion headquarters and headquarters battery.

23. The regiment (Tables I, II, and III).—*a. General.*—A regiment is both an administrative and a tactical unit and consists of a regimental headquarters and headquarters battery; a band; a service battery; either two 3-battery battalions, as in light artillery regiments, or three 2-battery battalions, as in medium and heavy artillery regiments; an attached chap-

lain, and medical personnel. The largest unit of trench artillery is the regiment comprising three battalions.

b. Medical detachment.—The medical detachment is that necessary to provide for guarding the health of the command, including dental work, and, in mounted units, for the treatment of sick and injured animals. The organization of the medical detachment is such as to permit the establishment of aid stations for each battalion and for the regiment when necessary.

c. Bands.—Organically part of a regiment, a band is commanded by the regimental adjutant and attached to a regimental unit for purposes of administration, mess, and supply. Transportation for the band is assigned to the service battery.

24. Ammunition trains (Tables I and II).—*a.* Ammunition trains are organically part of division and corps artillery brigades and of army artillery. The principal subdivisions of an ammunition train are a train headquarters and ammunition batteries; the number and type of the latter varying according to the type of train (division, corps, or army). Both animal-drawn (wagon) ammunition batteries and motorized (truck) ammunition batteries are assigned to division ammunition trains; only motorized (truck) batteries are assigned to corps and army ammunition trains.

b. Ammunition trains are organized to provide a mobile reserve of ammunition and to transport ammunition. Artillery ammunition is also carried in the corps quartermaster train. (Table II.)

c. Ammunition trains are organized to provide the transportation and labor necessary for the transport and handling of artillery ammunition and for the operation of artillery ammunition distributing and refilling points.

25. The brigade (Tables I, II, and III).—A brigade is the largest organic artillery unit. Its functions are primarily tactical, and it consists of a headquarters and headquarters battery, three or more regiments, and, in corps and division artillery, an ammunition train. In addition to the above, a corps field artillery brigade includes a sound and flash battalion and an attached ordnance company (maintenance); a heavy field artillery brigade of GHQ reserve artillery includes a sound and flash battalion and an attached ordnance company (heavy maintenance).

26. Groups and groupments.—These terms are applied to tactical units formed temporarily for convenience in carrying

out tactical missions. The term "group" is applied to two or more batteries assembled from different battalions; the term "groupment" is applied similarly to two or more battalions, groups, or larger tactical units. These terms are not applied to organic units. Groups are designated by the name of the group commander, as "Smith Group"; groupments by the name of a prominent terrain feature or by their relative location, as "Vaughn Hill Groupment," "Left Groupment," or "South Groupment."

CHAPTER 2

EQUIPMENT

27. General.—Field artillery equipment may be considered as falling in two categories, as follows:

a. Equipment common to the Field Artillery and other services, such as clothing, camouflage, preserving and cleaning material, signal equipment, and escort wagons.

b. Equipment special to the Field Artillery. Only major items of the latter will be discussed in this chapter; individual, signal, and horse equipment are treated in appropriate parts of the manual dealing with their employment.

28. Armament (table below).—The armament of Field Artillery consists of cannon and small arms. Detailed descriptions of armament will be found in the appropriate Technical Regulations.

a. Cannon.—With respect to the design of the weapon, as regards muzzle velocity, trajectory of the projectile, and carriage, cannon are classified as guns, howitzers, and mortars.

(1) Guns are pieces having comparatively flat trajectories and high muzzle velocities.

(2) Howitzers, as compared to guns of the same caliber, are pieces having more curved trajectories and lower muzzle velocities. In general, they have shorter tubes, are of lighter construction, are more mobile, and have not as great a maximum range.

(3) Mortars, as compared to howitzers of the same caliber, are pieces having more curved trajectories, lower muzzle velocities, and generally shorter tubes. They are designed to fire at angles of elevation greater than 45°, with the resulting characteristic that the range decreases as the elevation increases.

b. Small arms.—The small arms with which Field Artillery is equipped are—

Characteristics of field artillery

Caliber and type	Ammunition: Kind	Ammunition: Approximate weight (pounds): Projectile and fuze	Ammunition: Approximate weight (pounds): Complete round	Ammunition: Approximate weight (pounds): Complete round packed	Ammunition: Burst effect (yards): Range	Ammunition: Burst effect (yards): Lateral	Day of fire	Extreme range (yards)	Traverse permitted by carriage (mils)	Rates of fire, (rounds per minute): Prolonged	Rates of fire, (rounds per minute): Short bursts	Time to emplace	Approximate total weights (gun, carriage, and filled limber) [d]	Transport: Piece: Method	Transport: Piece: Number of loads	Transport: Ammunition: Method	Transport: Ammunition: Rounds per vehicle	Marches: Average rate (miles per hour)	Marches: Average day's march	Remarks
75-mm. pack howitzer, M1	Shrapnel (fixed)	16	20	25	150	25	300	5,600 [a]	105 (6°)	3	6	3 minutes	1,300	Pack	[b] 6	Pack	8	3½	20	Shell is H. E.
	Shell (semifixed)	18	22	27	5	25		9,000												
75-mm. gun, M1897, horse-drawn	Shrapnel (fixed)	16	20	25	150	25	300	6,700 [a]	105 (6°)	3	6	3 minutes	4,600	6-horse team	1	Caisson body	70	3½	20	Shell is H. E. or chemical.
	Shell, Mk. I (fixed)	12	17	22	5	25		8,800								Gun limber	35			
	Shell, Mk. IV (fixed)	14	19	25	5	25		12,500								Caisson limber	37			
																Wagon	100			
																Truck	200			
75-mm. gun, M1, horse-drawn	Shrapnel (fixed)	17	21	35	150	25	300	(c)	800 (45°)	3	6	3 minutes	4,600	6-horse team	1	Caisson body	70	3½	20	Do.
	Shell, Mk. IV (fixed)	15	24	34	5	25		14,880								Limber	11			
																Wagon	100			
																Truck	200			
75-mm gun:																				
When tractor drawn	(As above)											3 minutes	4,600	Tractor	1	Caisson body	70	4	30	Do.
When portée												5 minutes		Truck	1	Gun truck	60	8	60	
																Ammunition truck	200			
105-mm. howitzer, M1	Shrapnel (fixed)	33	42	56			200	6,540 [a]	800 (45°)	2	4	3 minutes	5,300	6-horse team or tractor	1	Caisson body		3½	20	Do.
	Shell (semifixed)	33	42	56	10	40		11,960								Limber	8			
																Truck	80	4	30	
155-mm. howitzer (Schneider), M1918	Shrapnel (separate loading)	95	102	115			150	10,800 [a]	105 (6°)	1	3	10 minutes	9,600	5-ton tractor	1	Caisson body	14	3½	30	Do.
	Shell (separate loading)	96	103	107	15	70		12,400								Truck	40			
155-mm. gun, M1918 (GPF)	Shell (separate loading)	96	122	126	15	70	100	17,500	1,065 (60°)	1	3	1 to 6 hours	[e] 29,150	10-ton tractor	1	Truck	40	3½	30	Shell is H. E. or chemical M1920, maximum range 26,000 yards.
240-mm. howitzer M1918	Shell (separate loading)	345	381	448			60	16,400	355 (20°)	¼	½	3 to 12 hours	58,600	10-ton tractor	[c] 4	Truck	12	3½	30	Shell is H. E. M1924, maximum range 25,000 yards.
Trench mortar, 6 inch model Mk. I	Shell (fixed)	53	54				150	1,850	1,775 (100°)	4	6	2 hours	925	Truck	1	Truck	100	8	60	

[a] Limit of time fuze.

[b] Maximum load, 243 pounds.

[c] Maximum load, 16,320 pounds.

[d] Weights will vary, depending on model of carriage and on kind of ammunition carried.

(1) *Automatic pistol, caliber .45, M1911.*—All personnel of Field Artillery are armed with the pistol.

(2) *Automatic rifle (Browning) M1918 and Browning machine gun, caliber .30, M1917.*—The automatic rifle and the machine gun are issued to field artillery units for defense against air attack and for use in the close defense of artillery installations. The machine gun, as issued to field artillery units, is equipped with a metal tripod so that it may be controlled in direction and elevation. Some units are issued special trailers of 1½-ton capacity with mounts for two machine guns.

29. Fire-control equipment (Vol. II).—This equipment is issued to field artillery units for the use of battery and higher commanders and their respective headquarters details, in preparing, conducting, or directing fire and for topographic work. Part of this equipment, such as aiming circles, prismatic compasses, range finders, and battery commander's telescopes, is issued by the Ordnance Department; part, such as alidades, plane tables, drafting equipment, sketching and drawing material, by the Corps of Engineers; and part, such as flash lights, bulbs, and batteries for flash lights, by the Signal Corps. The major items of fire-control equipment issued are given in Tables I, II, and III. The detailed descriptions of fire-control instruments and their operation are described in appropriate Technical Regulations.

a. The aiming circle.—This instrument is designed for measuring horizontal and vertical angles and may be used for stadia measurements. It is used for orientation purposes and for laying the pieces in direction; it may also be used in computing firing data. It is equipped with a low power monocular telescope, a large compass, and scales, graduated in mils, for reading horizontal and vertical angles. It is issued with a carrying case and tripod. (Fig. 4.)

b. Battery commander's telescope.—This instrument is designed for measuring horizontal and vertical angles and for the observation of fire. It is equipped with a 10-power binocular telescope, scales graduated in mils for reading horizontal and vertical angles, and a reticule in the right-hand telescope which is etched with scales reading mils for convenience in observing fire. It is supplied with tripod and carrying case.

c. Range finder.—This instrument is designed to determine ranges by a method of triangulation on the basis of a base line 1 meter in length, corresponding to the spacing of the objective

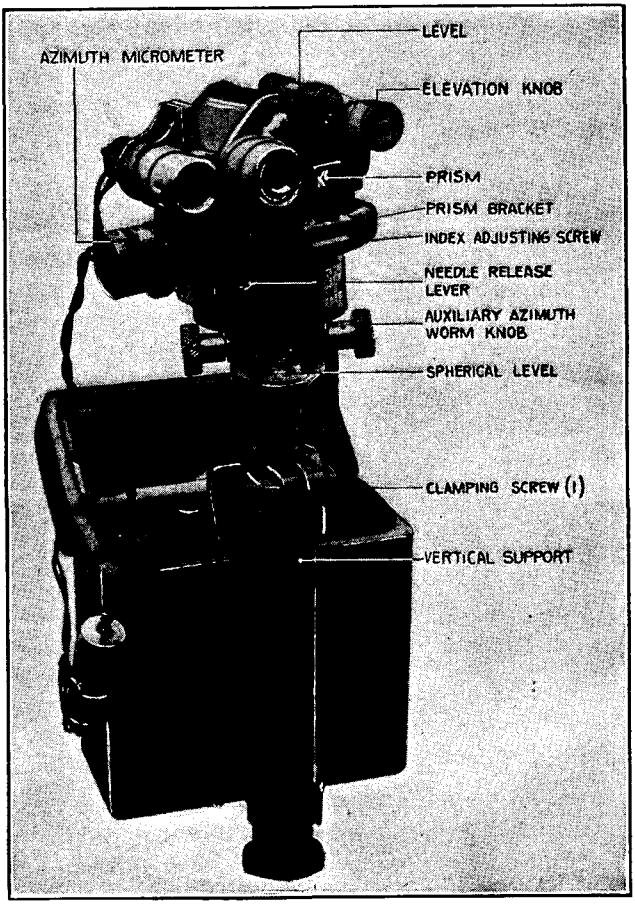


FIGURE 4.—Aiming circle, M1918 (French)

lenses of two horizontal periscopes having a common eyepiece. Ranges are read directly from a graduated drum on the instrument. The mount is equipped with scales, graduated in

mils, for reading horizontal and vertical angles. A tripod, carrying cases, an adjusting lath, and a storage chest are issued with the range finder. (Fig. 6.)

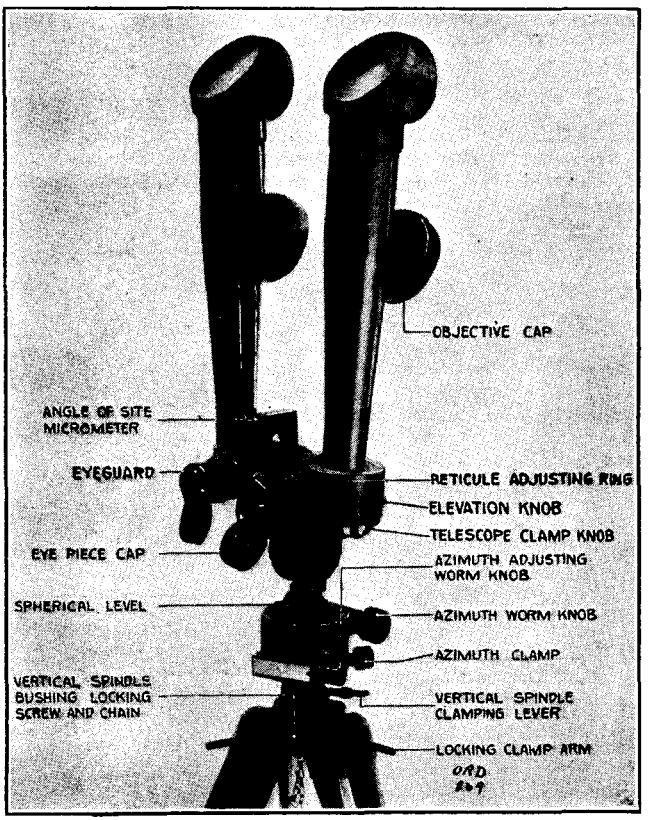


FIGURE 5.—Battery commander's telescope, M1915

d. Prismatic compass.—This instrument consists of a compass for reading horizontal angles with reference to the magnetic north, and a clinometer for reading vertical angles, the scales of both being graduated in mils. It may be used in computing firing data, for laying pieces in direction, and for

topographic work. It is supplied with a tripod and carrying cases. The instrument may be used without its tripod and may be carried conveniently on the person. (Fig. 7.)

c. Engineer equipment.—The major items of engineer equipment issued by the Corps of Engineers are listed in Tables I, II, and III. They are provided for use in the computation of firing data, orientation and topographic work, preparation of charts and diagrams, and for other drafting and mapping purposes.

30. Sighting and laying equipment (Vol. II).—The equipment herein described is that which is used directly with the piece in laying it for direction and range, exclusive of those

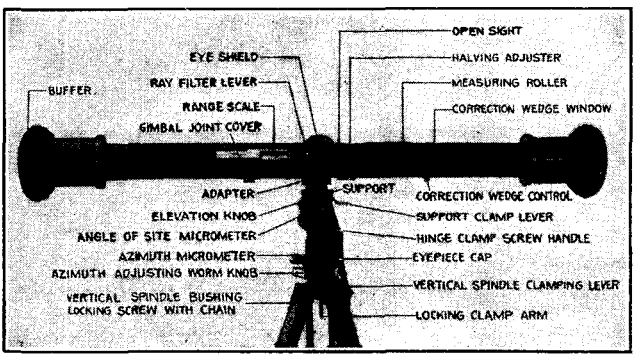


FIGURE 6.—Range finder, M1916 (1-meter base)

items which are a part of the piece or carriage, or which are accessories thereto, such as range drums. The detailed description of this equipment and of its operation will be found in the appropriate Technical Regulations.

a. Panoramic sight.—This instrument is used to lay the piece for direction. It consists of a vertical telescope which permits bringing into the field of view points in a plane perpendicular to the axis of the telescope. The telescope may be rotated through a horizontal angle of 6,400 mils and is equipped with a scale and micrometer, reading in mils, permitting the setting of any horizontal angle. It has a quick-release device for rapid movement of the telescope in setting off angles. Some late models have a device for reading vertical angles. The sight is

removable from its mount on the piece to prevent injury from shock in firing or movement. (Fig. 8.)

b. French sight, M1901.—This instrument is used in laying the French 75-mm. gun, M1897, in direction. The sight is of the

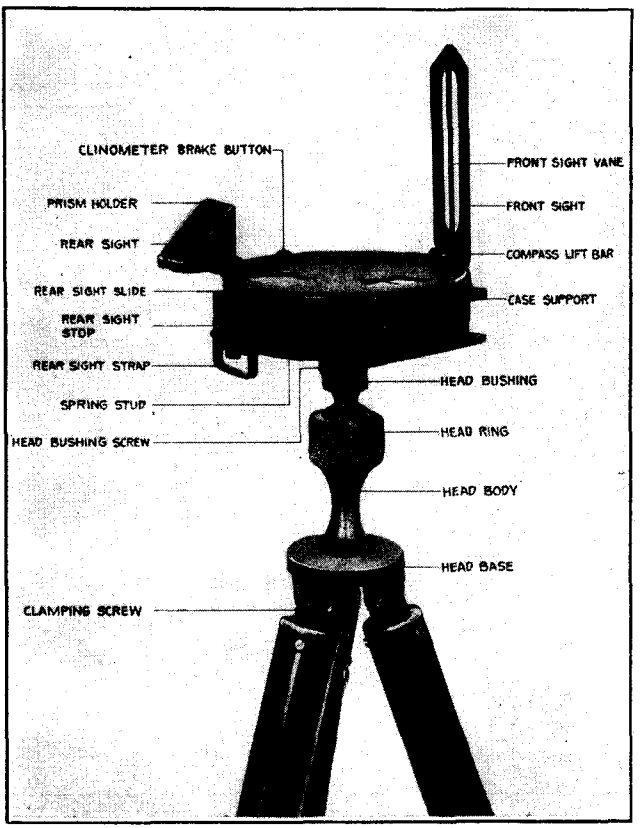


FIGURE 7.—Prismatic compass, M1918

collimating nontelescopic type, differing in this respect from the panoramic sight. For the purpose of setting off horizontal angles, the sight shank turns about its vertical axis and has an index reading against a scale. A micrometer and scale are

also provided. Horizontal angles to be set off on this sight must be computed in terms of plateau and drum, corresponding to the scale units in which the scales of the sight shank and micrometer are graduated. The sight is provided with a

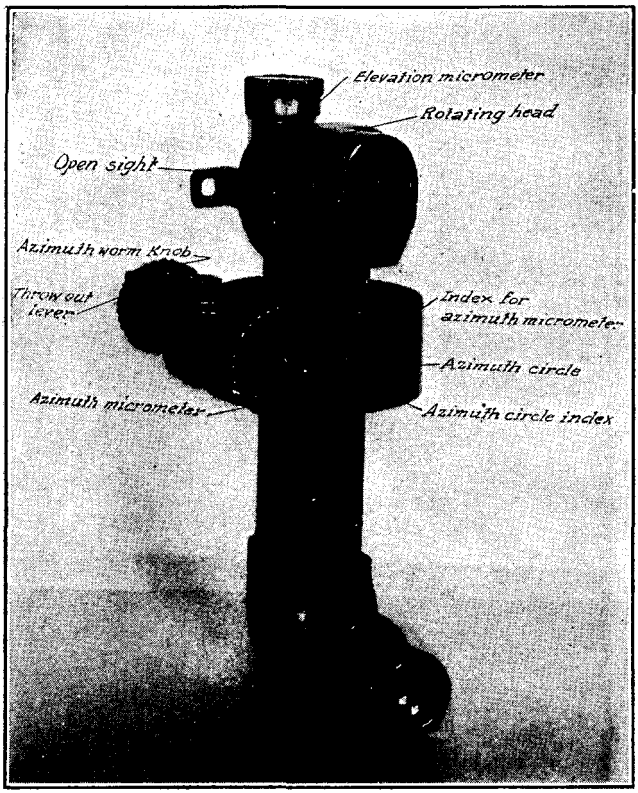


FIGURE 8.—Panoramic sight, M1917

sight shank extension bar for use when the gunner's view would otherwise be obstructed. The sight may be removed from the piece for safety from shock in firing or movement. The sight bracket includes a mechanism for setting off vertical angles. (Fig. 9.)

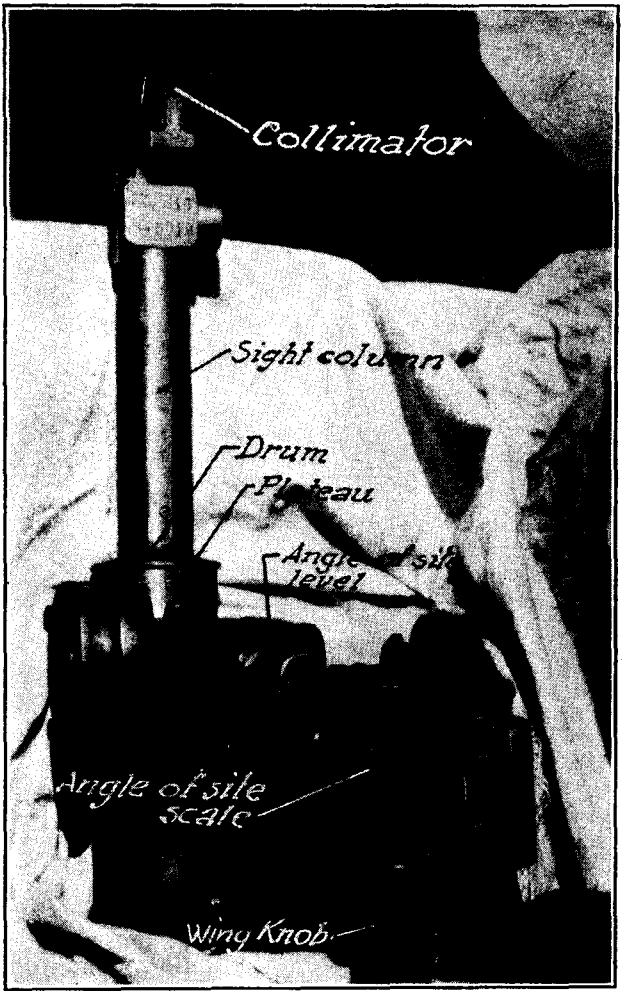


FIGURE 9.—French sight, M1901

c. Gunner's quadrant.—This instrument is designed for use in laying the piece for elevation. It has a scale graduated in mils and a sliding attachment for making accurate settings possible to 0.2 mils. In use, the desired angle of elevation is set upon the quadrant; it is held in place by hand upon the leveling plate of the piece, and the piece elevated or depressed until the bubble of the level is centered. It is removed before firing the piece. (Fig. 10.)

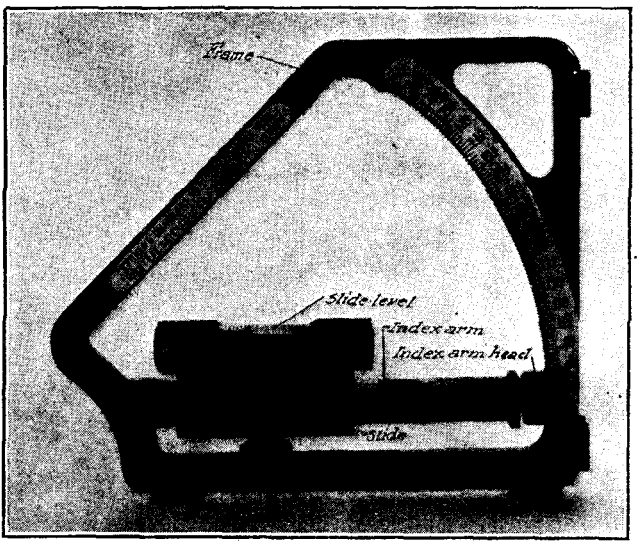


FIGURE 10.—Gunner's quadrant, M1918

31. Ammunition vehicles.—The vehicles supplied to the Field Artillery for ammunition transport are limbers, caissons, trailers, trucks, and escort wagons. The trucks and escort wagons provided for this purpose are not of special design for artillery.

a. Limbers.—(1) The 75-mm. gun-caisson limber is a 2-wheeled vehicle used for trailing a gun or caisson and for carrying ammunition. The chest diaphragm is perforated with 39 holes, four of which in gun limbers and two in caisson limbers are used for oils and greases, the remainder being used for ammunition. At the rear of the limber is a pintle to which a gun or

caisson may be attached by means of its lunette. Later models of limbers are provided with pole support attachments to reduce the pressure on the wheel horses' necks. A loaded limber weighs approximately 1,900 pounds.

(2) Limbers for the 155-mm. and larger calibers are used to support the trails of the carriages and are not equipped to carry ammunition.

b. Caissons.—(1) The 75-mm. gun caisson is a 2-wheeled vehicle supporting an ammunition chest on a frame which at the forward end terminates in a lunette and at the rear in a pintle. The chest diaphragm is constructed to hold 70 rounds of ammunition. The total weight of the caisson loaded is approximately 3,000 pounds.

(2) The 155-mm. caisson is a 2-wheeled vehicle supporting an ammunition chest on a frame which terminates in a lunette and pintle arranged as in the 75-mm. gun caisson. The ammunition chest consists of two compartments, the upper designed to carry 8 projectiles and 16 powder charges; the lower, 6 projectiles. The diaphragms in both compartments are constructed so that they may be moved to permit carrying the different types of projectiles provided for the 155-mm. howitzer. Only one type can be carried in a compartment at any one time. The total weight of the caisson loaded is approximately 3,950 pounds. Two caissons limbered together are drawn by a 5-ton tractor.

32. Repair and supply vehicles.—*a. Horse-drawn units.*—(1) *Forge limber.*—The outstanding difference between this limber and the gun-caisson limber is in the construction of the chest. The chest is designed to carry the horseshoer's tools and some of the mechanic's tools and supplies, being divided into appropriate compartments. This limber, weighing when loaded about 1,575 pounds, is used for trailing the battery and store wagon.

(2) *Battery and store wagon.*—This is a 2-wheeled vehicle with a frame somewhat similar to that of a caisson, terminating in a lunette on the forward end. A vise is fitted on the forward end of the frame. The chest is divided into compartments for carrying battery supplies, such as mechanic's tools, spare parts, and cleaning and preserving material. This wagon carries two spare wheels.

b. Motorized units.—(1) *Light repair trucks.*—These are light trucks used for the rapid transport of such personnel, equip-

ment, tools, and lubricants as are required for emergency road repair of motor vehicles.

(2) *Supply and ammunition trucks.*—In general, this equipment is of the commercial type, consisting of trucks of approximately 3 to 5 ton capacity, and lighter trucks for special purposes, such as carrying fire-control and signal equipment.

(3) *Trailers.*—Different models of trailers, in general, of the 4-wheel, low-slung body design, with a cargo capacity varying from 3 to 5 tons, are issued to units of heavy artillery. They are designed for coupling to a tractor or truck. Trailers are employed for carrying personnel, section equipment, and essential supplies. In certain units they also carry a limited number of rounds of ammunition.

33. Cars, passenger.—Cars of four or five passenger capacity are generally of commercial design. Cars of greater capacity may be of special design and are used for the transport of personnel, equipment, and supplies of the details of batteries and higher units.

34. Signal communication equipment.—*a. General.*—Signal equipment issued to field artillery units is, as a rule, standard for all services.

b. Reels and carts.—The means issued to the Field Artillery for carrying wire are the breast reel, carrying 200 yards of wire; the real cart, type RL–16; the battery reel, M1917; the reel, M1909 M1, with cart, M1918; and the pack artillery reel. In addition, provision is made for carrying one-half mile of wire on each of the fifth-section caissons of 75-mm. gun batteries. Each mountain wagon of 75-mm. gun batteries, horse drawn, carries approximately 3½ miles of wire.

(1) *Battery reel, M1917.*—This vehicle, issued to 75-mm. gun batteries, horse drawn, is mounted on two wheels and drawn by four horses. It is designed to carry, lay, and recover approximately 1½ miles of wire. In addition two chests are provided to carry certain articles of fire-control equipment, such as the battery commander's telescope, aiming circles, range finder, etc.

(2) *Reel, M1909, M1, with cart, M1918.*—These vehicles are issued to motorized units and to battalion, regimental, and brigade headquarters of horse-drawn units. The cart is a 2-wheeled vehicle designed with a lunette at the forward end of the middle rail and a pintle at the rear end. A chest is mounted on the frame in which are carried certain fire-control

instruments, such as aiming circles, battery commander's telescopes, and telephones. The reel, having interchangeable pole connections, can be drawn by either motor traction or horses. With the drums loaded and the cart attached it is a 6-horse load weighing approximately 3,900 pounds. It will carry, lay, and recover 3¼ miles of wire.

(3) *Reel cart, type RL–16.*—This reel, designed to be drawn by hand, is mounted on two wheels, bicycle type, and carries 1 mile of wire. It is issued to units of sound and flash battalions.

(4) *Pack artillery reel.*—This reel is designed to be carried on a pack animal and consists of an axle and mount arranged to take issue spools, each spool carrying one-half mile of wire.

35. Care, preservation, and repair of equipment.—Instructions relative to this subject are contained in appropriate Technical Regulations. The following are for general guidance:

a. Programs and schedules of instruction will provide for the care and preservation of equipment.

b. All sighting and fire-control equipment will be adjusted regularly and the adjustment verified.

c. Only repairs specifically authorized will be made by battery personnel.

d. Periodic inspections of matériel will be held frequently.

e. Only cleaning and lubricating material authorized and issued will be used.

f. When wear on a part of the equipment is first observed, steps will be taken immediately to make a new part available.

g. Rust is the starting point of serious injury. Do not permit water to get into oil or grease. Remove kerosene from a surface before oiling.

h. All bearings and movable surfaces in contact must be kept lubricated.

i. Normal quantities of liquid and normal gas pressure must be maintained in recoil mechanisms.

j. Bores must be kept free from rust or foreign matter; when practicable, bores will be washed and lightly greased during firing.

k. Inspections for erosion and copper fouling will be made frequently and prompt reports thereon rendered.

l. Metal parts must not be struck directly with a hammer; a piece of wood or copper will be interposed.

m. Sand and grit must be cleaned from ammunition prior to loading.

n. Instructions relative to removing projectiles and primers will be adhered to rigorously.

o. All steel and iron nonbearing surfaces will be painted. Parts to be painted are generally indicated by painting prior to issue. Dirt and grease will be removed prior to painting.

p. Special precautions, as prescribed, will be taken relative to material exposed to gas.

q. In marching, or in other movements, inspections will be conducted to insure that traveling locks are fastened and covers, such as muzzle and breech covers, are properly adjusted.

CHAPTER 3

AMMUNITION

36. Description.—Detailed descriptions of all field artillery ammunition will be found in appropriate Technical Regulations.

37. Explosives and propellants.—An explosive is a solid, liquid, or gaseous substance or mixture which may, upon the application of heat or a blow to a small portion of the mass, be converted in a very short interval of time into other stable substances, largely gaseous. Military explosives are generally classified as low explosives and high explosives.

a. A *low explosive* is one in which the explosion is in the nature of ordinary combustion. The time required to complete the explosion is relatively large compared to the time for detonation. The explosion of low explosives is brought about by simple ignition; that is, by contact with the flame from a primer. Black powder is a typical low explosive.

b. (1) A *high explosive* is one in which the explosion is spoken of as a detonation. In this explosion the material does not burn, but the action takes place almost simultaneously throughout the mass. The disruptive or shattering effect is much greater than that of a low explosive because of the extremely short time involved in the detonation.

(2) There are certain high explosives known as initiating explosives which will not burn, but detonate at once upon ignition. Such explosives, mercury fulminate being an example, are used to initiate a detonation or ignition in other explosives, the detonation of the initiator being started by the flame from a primer, by a blow, or by a heated wire.

38. Projectiles.—A projectile is a missile thrown from a cannon by a propelling charge. The projectile generally serves as a carrier for an explosive, chemical, or other material which is to be exploded or scattered at the target. In general the shape and elements of a high-explosive shell are as shown in Figure 11.

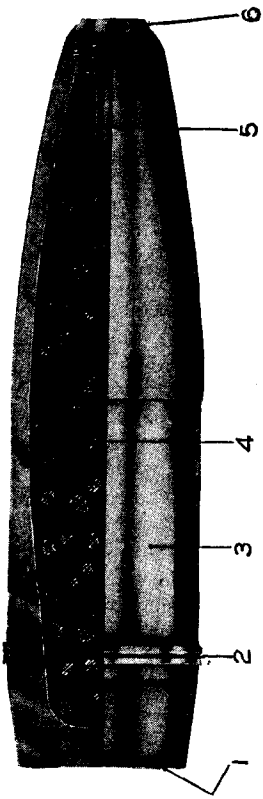


FIGURE 11.—155-mm. high-explosive shell, Mk. I

1. Base cover.
2. Rotating band.
3. Shell.
4. Bursting charge (T. N. T. or amatol).
5. Booster.
6. Adapter.

a. Parts of projectiles.—(1) *Ogive.*—The curved portion of the projectile from the bourrelet to the point is called the ogive.

(2) *Bourrelet.*—The bourrelet is a narrow surface, of a diameter slightly larger than the body of the projectile, located between the body of the projectile and the ogive. This surface

is given either a ground or extra smooth machine finish and furnishes a bearing or guide for centering the projectile in the bore of the cannon.

(3) *Rotating band.*—The rotating band is a ring of copper pressed into a knurled groove near the base of the projectile. Its primary function is to impart rotation to the projectile, acting under the influence of the rifling in the bore, the rotation maintaining stability of the projectile during flight. It prevents the gases of the propelling charge from escaping past the projectile during its travel through the bore of the cannon and serves to seat a projectile properly when it is rammed into the bore.

(4) *Adapter and booster.*—In general, an adapter is a bushing fitted into the nose of the shell and threaded to take a fuze. Attached to the adapter is a booster casing containing a charge of high explosive, which serves to boost the energy liberated by the fuze, so as to insure the detonation of the bursting charge of a high-explosive shell or to disrupt a chemical shell.

(5) *Base.*—That part of the projectile to the rear of the rotating band is called the base. A square-base projectile is one in which that portion of the projectile in rear of the rotating band is cylindrical. If this portion is tapered, the base is described as boat-tailed.

b. Types of projectiles.—The projectiles fired by field artillery are classified according to the nature of the projectile as shrapnel and shell.

(1) *Shrapnel* (fig. 12).—The shrapnel projectile is a complete gun in itself. When the time fuze with which the shrapnel is fitted has burned its predetermined time the magazine charge of the fuze flashes through the central tube and ignites the base charge. The head is sheared from the base, which does not break up, and the diaphragm, balls, and matrix are shot from the case with a velocity of about 350 feet per second. This velocity is in addition to that of the shrapnel itself at the time of burst.

(2) *Shell* (fig. 11).—Shell is a projectile so designed and filled that the case of the projectile will be ruptured upon explosion. Shell are classified, in the case of projectiles used by field artillery, according to the nature of their filling, as high-explosive shell and chemical shell.

(*a*) *High-explosive shell.*—This projectile is filled with high explosive. The fragments of the case, ruptured by the detona-

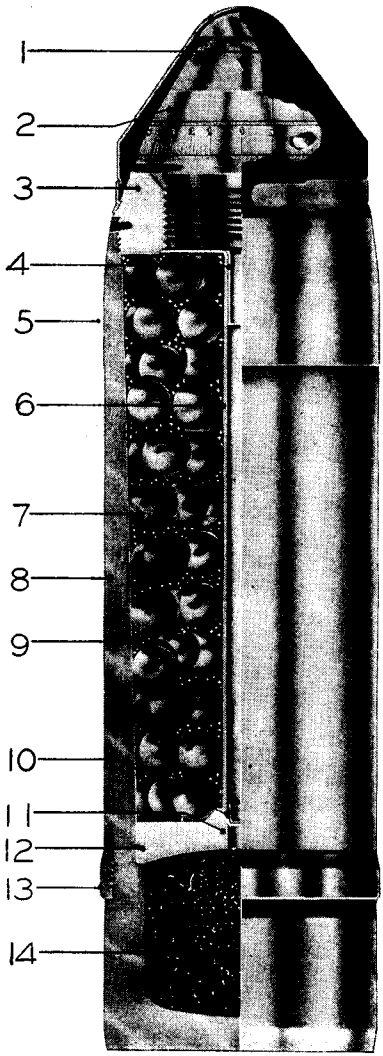


FIGURE 12.—75-mm. shrapnel

1. Water-proof cover.
2. 21-second combination fuze.
3. Head.
4. Inner tube.
5. Bourrelet.
6. Central tube.
7. Balls.
8. Case.
9. Matrix (resin).
10. Fiber paper cup.
11. Cloth disk.
12. Diaphragm.
13. Rotating band.
14. Base charge (loose black powder.

tion of the bursting charge, are effective against personnel and matériel, depending upon the size of the fragments and their velocity at the time of impact.

(*b*) *Chemical shell.*—This type of shell is burst by a small bursting charge contained in the booster, which ruptures the case, permitting the escape of the chemical material which constitutes the shell filling. The nature of the filling varies and may be, for example, smoke producing, incendiary, or gas.

39. Fuzes.—A fuze is a device which detonates or ignites the charge of a shell, shrapnel, or other projectile at the time or under the circumstances desired.

a. Classification.—Fuzes for the Field Artillery are classified as point detonating, base detonating, and time. None of the projectiles for the Field Artillery is at the present time base fuzed.

(1) *Point detonating.*—A point detonating fuze is designed and intended for assembly in the nose adapter of a shell. This type of fuze is intended to function upon impact according to the conditions of delay (determined by the design), as follows:

(*a*) The long fuze is a superquick-action fuze designed to burst the projectile promptly on impact and before it has penetrated.

(*b*) The short fuze is a fuze designed to burst the projectile after the projectile has penetrated or ricocheted. These fuzes are classified, depending on the time of action, as nondelay, short delay, and long delay.

(*c*) The present issue for Field Artillery includes a long and short type of fuze for each caliber. A unit fuze is being manufactured which may be set at will to give either superquick or delay action.

(2) *Time.*—This type of fuze is designed to function at some predetermined time after the projectile leaves the gun. Such fuzes are used with shrapnel and, for certain types and calibers of cannon, with shell. Time fuzes for shrapnel which are intended for use against ground targets are also provided with a percussion element which permits the functioning on impact, if so desired, or if the time element fails to function.

b. Fuzing of projectiles.—All shell, except base-fuzed shell, are fuzed immediately before insertion of the shell in the cannon prior to firing. Shrapnel are issued fuzed.

40. Primers.—*a.* Primers for field artillery purposes are devices for igniting the propelling charges of cannon. The primer, in addition to a detonator, contains a quantity of black powder sufficient to ignite the propelling charge. In semifixed and fixed ammunition (rounds having brass cartridge cases) the primer is forced into the base of the cartridge case at the loading plant prior to loading the propelling charge. With bag-loaded rounds (separate loading ammunition) the primer is inserted into the breech mechanism of the cannon prior to the firing of each round.

b. All primers used in the Field Artillery are of the percussion type; that is, are ignited by a blow from the firing pin of the cannon.

41. Propelling charges.—*a.* The propelling charge for all field artillery cannon is nitrocellulose smokeless powder. In fixed ammunition the propelling charge is loaded loose in the cartridge case; in semifixed and in separate loading ammunition it is loaded into one or more bags.

b. The cartridge case is a brass case of such size and shape as to conform to the powder chamber of the cannon for which it is designed. The primary function of the cartridge case is to hold the propelling charge; however, in addition, it prevents the escape of the burning gases to the rear by expanding against the powder chamber of the cannon under the pressure of the gases themselves.

c. For calibers larger than 105-mm., charges are made up in bags.

42. Complete round elements and classification.—*a.* A complete round of artillery ammunition consists in general of a primer, a propelling charge, the container for the propelling charge (cartridge case or bags), a projectile with adapter and booster, and a fuze.

b. When the components of a round of ammunition are issued assembled in a complete unit they are spoken of as fixed ammunition. The cartridge case contains the primer and the propelling charge, and is crimped to the projectile. Nearly all shell in fixed ammunition are shipped unfuzed, and it is necessary to insert a fuze in the shell before firing the round. Shrapnel are shipped fuzed.

c. Semifixed ammunition differs from fixed ammunition in that while the projectile and cartridge case are issued as-

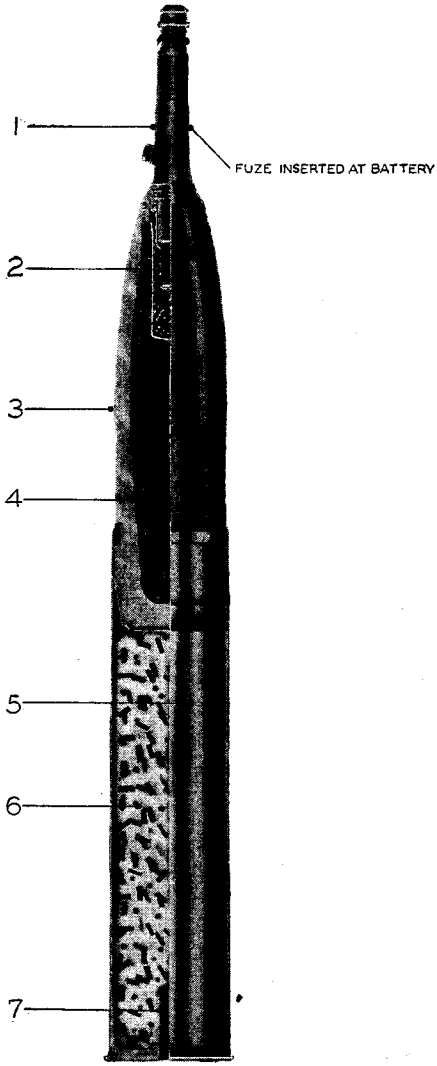


FIGURE 13.—Fixed ammunition (assembled round 75-mm.)

1. Fuze (long).
2. Adapter and booster.
3. High-explosive shell.
4. Bursting charge.
5. Cartridge case.
6. Propelling charge.
7. Primer.

sembled and are loaded into the gun as a unit, the cartridge case is not permanently attached to the projectile but may be removed from it at the firing point for the purpose of varying the amount of the propelling charge as desired.

d. In the larger calibers, where the projectile is heavy and the propelling charge correspondingly large, it is necessary to use separate loading ammunition. There are two types of separate loading ammunition; one, using a brass cartridge case containing the primer and propelling charge, is designated as separate loading brass cartridge case; the other, having the powder assembled in one or more bags, with the primer a separate unit, is designated as separate loading bag.

PART THREE

TRACTION AND DRILL

CHAPTER 1

DISMOUNTED FORMATIONS

SECTION I

GENERAL PRINCIPLES AND BASIC FORMATIONS

43. General principles and basic formations.—*a.* The basic training of Field Artillery is as a mounted arm. Within the battery the basic element of organization and command is the section; as a basic requirement the integrity of the section must be preserved. Dismounted drills and ceremonies have a distinct disciplinary value, developing soldierly bearing and alertness.

b. The 75-mm. gun type of organization is used for purposes of illustration. The principles enunciated, however, are applicable to all types.

c. General rules for close-order drill, details of the instruction of the individual soldier dismounted, and the manual of the

pistol dismounted are contained in Basic Field Manual, Volume II.

d. Platoon movements for Field Artillery dismounted are exceptional and will be executed only when necessary or specifically prescribed, as in the ceremony of guard mounting.

SECTION II

THE SQUAD

44. General.—*a. Definition and purpose.*—A squad is a group of soldiers formed for purposes of instruction, discipline, control, and order.

b. General principles.—In the drill of the squad the principles contained in Basic Field Manual, Volume II, are applicable except in so far as they refer to the rifle. Field Artillery in dismounted formations is armed with the pistol.

45. Strength.—The squad proper consists of a corporal and seven privates and/or privates, first class. If the number of men grouped is more than 5 and less than 12, they are formed as a squad of 4 files, any excess above 8 being posted in the line of file closers. The corporal, or in the absence of a corporal, the senior in command, is the right front rank man of each squad. Additional corporals in any squad are assigned positions as indicated in Figures 19, 20, and 21.

46. Movements incident to forming a column of twos to the flank.—*a. To form a column of twos to the flank.*—The squad being in line and at a halt, the command is: 1. ***Right (left),*** 2. ***FACE,*** 3. ***Forward,*** 4. ***MARCH.*** At the command ***Face,*** the men face to the right. At the command ***March,*** the leading file steps off, the files in rear mark time, executing the command in succession so as to follow at 40 inches distance.

b. To halt.—The command is: 1. ***Squad,*** 2. ***HALT.*** At the command ***Halt,*** the leading file halts and the files in rear close up to facing distance and halt successively. To halt without closing, the command is: 1. ***In place,*** 2. ***HALT.***

c. To form line.—Being in march, the command is: 1. ***Squad,*** 2. ***HALT,*** 3. ***Left (right),*** 4. ***FACE.*** The last two commands are given after the second has been executed. Line is not formed while marching.

SECTION III

THE SECTION

47. Organization and strength.—*a.* A section dismounted retains its permanent designation and consists of the personnel permanently assigned to it.

b. The senior noncommissioned officer with each section is its chief of section.

c. The strength of sections and the number and grade of noncommissioned officers with sections vary.

48. Formations.—*a.* Each section is formed in order from right to left as follows:

(1) *Headquarters section.*—Headquarters personnel, scouts, signal personnel, instrument personnel, drivers.

(2) *Gun section.*—Gun squad, driver squad.

(3) *Caisson section.*—First caisson personnel, second caisson personnel.

(4) *Maintenance section.*—Drivers, mechanics, other maintenance personnel. cooks.

b. In forming for close-order drill, the sections are composed of squads similar to infantry squads. Large sections, such as the headquarters section, may be divided into two sections for close-order drill.

c. The habitual formations for marching the section are the column of squads and the section line. Where the terrain will not permit these, column of twos may be used.

d. Posts of noncommissioned officers pertaining to a section are given in paragraph 61 and in Figures 19, 20, and 21. In all formations, file closers will be reduced to a minimum.

49. Rules.—*a. General.*—The section executes the halt, rests, facings, steps and marchings, and opens and closes ranks, takes interval, obliques, resumes the direct march and preserves alignments as explained for the individual and the squad in Basic Field Manual, Volume II, and executes maneuvers incident to column of twos formed to the flank, as explained for the squad; section being substituted for squad in commands when appropriate.

b. Rules for guides.—(1) The guide of a section in column of squads is the right or left front rank file of the leading squad, depending on whether the guide had been announced as right or left. Marching with the guide left (right) to change the guide,

and file closers from one flank to the other, the chief of section commands: 1. *File closers on the left (right) flank,* 2. *MARCH.* At the command *March,* the file closers dart through the column and post themselves on the left (right) flank; the chief of section changes to the right (left) flank and the right (left) front rank file becomes the guide of the column.

(2) Unless otherwise announced, the guide of a section in line is right and of a rank in column of squads is toward the side on which the chief of section marches.

(3) The section being in line, to march with the guide other than as prescribed above, or to change the guide, the command is: *GUIDE RIGHT (LEFT).*

(4) The announcement of a guide when made in connection with a movement follows the command of execution of the movement.

(5) The guide of a unit keeps direction by aligning two points directly in his front and marching on them.

50. To form the section.—To form a section before the permanent assignments have been made, the chief of section indicates on the ground where the right of the section is to rest and places himself two paces in front of where he desires the center of his section to be; the gunner, ammunition corporal, or a designated private, as the case may be, places himself as the right front rank man at the point indicated by the chief of section. The chief of section then commands: *FALL IN.* The men assemble at attention in two ranks on the base file as prescribed for the squad. The section is divided into squads, beginning on the right flank. The chief of section then commands: 1. *Count,* 2. *OFF.* At this command, each squad counts off as prescribed for the infantry squad. After permanent assignments have been made, the men fall in according to their permanent assignments, such rearrangement as may be necessary for close-order drill being made by the chief of section.

51. Alignments.—The base file having been established, the command is: 1. *Right (left),* 2. *Dress,* 3. *FRONT.* At the command *Dress,* the movement is executed in the manner prescribed for the platoon in Basic Field Manual, Volume II, excepting that the chief of section, having verified the alignment of the ranks, steps forward two paces beyond the front rank, halts, faces down the line and commands: *FRONT,* marches parallel to the front of his section until opposite its center, halts, and faces to the front.

52. Movements to the rear.—*a.* The section being in line or column of squads, to march to the rear, the command is: 1. ***Squads right (left) about,*** 2. ***MARCH,*** or 1. ***Squads right (left) about,*** 2. ***MARCH,*** 3. ***Section,*** 4. ***HALT.*** The movement is executed by each squad as prescribed in the drill of the squad. If in line, each file closer darts through the nearest interval and takes post.

b. To march to the rear a short distance, the command is: 1. ***About,*** 2. ***FACE,*** 3. ***Forward,*** 4. ***MARCH,*** 5. ***Section,*** 6. ***HALT.*** The file closers on facing about maintain their relative positions. No other movement is executed until the line is faced to the original front.

53. To turn on a moving pivot.—The section being in line, to change direction, the command is: 1. ***Right (left) turn,*** 2. ***MARCH,*** 3. ***Section,*** 4. ***HALT,*** or 3. ***Forward,*** 4. ***MARCH.*** The movement is executed in the manner prescribed for the infantry platoon. (Basic Field Manual, Vol. II.)

54. To turn on a fixed pivot.—The section being in line, to turn the section, the command is: 1. ***Section right (left),*** 2. ***MARCH,*** 3. ***Section,*** 4. ***HALT,*** or 3. ***Forward,*** 4. ***MARCH.*** The movement is executed in the manner prescribed for the infantry platoon.

55. To form column of squads.—*a.* The section being in line, to form column of squads to a flank and march, the command is: 1. ***Squads right (left),*** 2. ***MARCH.*** To execute the same movement and halt, the command is: 1. ***Squads right,*** 2. ***MARCH,*** 3. ***Section,*** 4. ***HALT.*** The movements are executed by each squad in the manner explained in the drill of the squad.

b. The section being in line, to form column of squads and march to the front, the command is: 1. ***Right (left) by squads,*** 2. ***MARCH.*** The movement is executed in the manner explained in the drill of the infantry platoon.

56. Movements from column of squads.—*a. To form line to a flank.*—The command is: 1. ***Squads right (left),*** 2. ***MARCH.***

b. To form line on the right or left.—The command is: 1. ***On right (left) into line,*** 2. ***MARCH,*** 3. ***Section,*** 4. ***HALT,*** 5. ***FRONT.***

c. To form line to the front.—The command is: 1. ***Right (left) front into line,*** 2. ***MARCH,*** 3. ***Section,*** 4. ***HALT,*** 5. ***FRONT.***

d. To change direction.—The command is: 1. ***Column right (left),*** 2. ***MARCH.***

e. The above movements are executed in the manner explained in the drill of the infantry platoon, in proper cases substituting the word "section" for "platoon."

57. Movements at ease and at route step.—Instructions relative to these movements, as prescribed in the drill of the infantry platoon, are applicable.

SECTION IV

THE BATTERY

58. Formations.—The usual formations of the battery dismounted are: *Line* (*normal formation or march formation*), *column of sections*, and *column of squads*. (Figs. 14, 15, and 16.)

a. Normal formation.—(1) When forming dismounted for any purpose, the gun battery assembles in line. (Fig. 14, ①.)

(2) Headquarters and service batteries, combat trains, ammunition train batteries, and detachments are formed dismounted in accordance with the general principles prescribed for gun batteries.

(3) The maneuver from the normal formation in line will be by column of sections or column of squads, when marching to gun park and stables for mounted drill. The battery in this case is maneuvered by the same commands and in a manner generally similar to that prescribed for the infantry platoon. The squads are the normal gun, driver, caisson, etc.

b. March formation.—(1) The battery being in normal formation, to form the battery for dismounted drills or ceremonies, the command is: ***MARCH FORMATION.*** (Fig. 14, ②.) At this command, each chief of section forms his section in squads. (Par. 45.) The battery commander exercises his discretion in attaching men to sections and to squads. If the battery is to march in review, it is desirable that sections have a uniform frontage.

(2) A miscellaneous group of men to be exercised in foot drill or calisthenics will be formed in squads.

(3) *Unless otherwise specifically indicated, instructions prescribed hereafter apply to troops in the march formation.*

59. Organization.—At dismounted formations and ceremonies, lieutenants with the battery are assigned commands as follows: A lieutenant, normally the reconnaissance officer, in command of the headquarters section; a lieutenant, normally the senior lieutenant, in command of the 1st and 2d sections, (1st platoon); a lieutenant in command of the 3d and 4th sec-

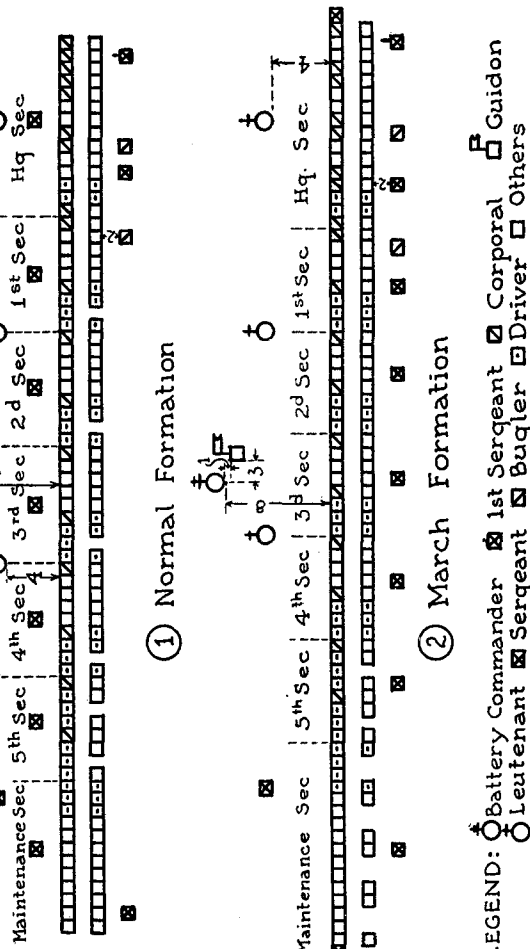


FIGURE 14.—Battery in line

tions (2d platoon); and a lieutenant in command of the 5th section (ammunition section) and maintenance section (3d platoon). Additional lieutenants take posts in the file closers. In the absence of lieutenants, noncommissioned officers are assigned to command the above-designated units.

60. General rules for dismounted drill.—*a.* The permanent designation of the section is used when referring to it at dismounted formations. In addition, the designations *right* and *left*, when in line, or *leading* and *rear*, when in column, may be used. Either in line or in column the designation *center* may be used where no misunderstanding may result.

b. Platoon commanders do not repeat commands except when the battery is executing platoon movements. However, in movements executed at route step or at ease the platoon commanders may repeat commands, if necessary. During movements, while the platoon commanders give no commands, they may, when necessary, caution the chiefs of section as to their commands.

c. Chiefs of section do not repeat commands except in section movements when they repeat or give such commands as will cause their sections to execute the movement ordered; as, for instance, being in column of sections, at the battery commander's command ***Right front into line***, the chief of the leading section gives the command ***FORWARD***; the chiefs of the other sections: ***RIGHT OBLIQUE***. The movement is executed at the battery commander's command of execution.

d. At the command ***Guide right (left)***, chiefs of sections repeat the command.

e. The battery executes the halt, rests, facings, steps, and marchings, and takes interval and assembles, obliques, resumes the direct march, turns on a moving pivot and on a fixed pivot, preserves alignments, and forms column of sections and column of squads, as explained in Section II (this chapter) and in Basic Field Manual, Volume II, "battery" being substituted for "section" or "platoon" when appropriate.

f. Where the sections are of uneven size, upon forming column from line the guides of the rear sections gain or lose distance gradually, so that distances between elements will enable line to be formed from column without crowding or causing gaps.

g. Where the sections of the battery are of uneven size and it is planned to change from column to line the guide must be changed to the side toward which the movement is to be made, if not already on that side.

h. The battery opens and closes ranks in a manner similar to that prescribed for the squad. Immediately following the command ***March***, the battery commander aligns the battery. (Par. 64.)

i. The battery executes maneuvers incident to column of twos formed to the flank as prescribed for the section.

j. The battery in column of squads changes direction as explained for the section.

k. When the formation admits of the simultaneous execution by sections of movements prescribed in Section III, the battery commander may cause such movements to be executed by prefixing, when necessary, "sections," to the commands prescribed therein, such as, 1. ***Sections, right front into line,*** 2. ***MARCH.*** To complete such simultaneous movements, the command ***Halt*** or ***March***, if prescribed, is given by the battery commander.

61. Posts of individuals.—*a. In line.*—(1) *The battery commander, platoon commanders, reconnaissance officer, first sergeant, chiefs of section, and guidon.*—Posts are as indicated in Figure 14.

(2) *Noncommissioned officers of the maintenance and fifth sections.*—For dismounted formations, when the senior noncommissioned officer with the two sections is assigned as commander of the platoon, he takes post as prescribed for a platoon commander. His section is commanded by the next senior noncommissioned officer present with that section.

(3) *The gunner.*—In the front rank, on the right of his squad.

(4) *The ammunition corporal or caisson corporal.*—In the front rank, on the right of his squad.

(5) *File closers.*—Two paces in rear of the rear rank of their respective sections.

(6) *Guidon.*—Three paces to the right and one pace to the rear of the battery commander.

b. In column of sections (fig. 15).—Same as above, with the following exceptions:

(1) *Battery commander.*—Eight paces from the flank and opposite the center of the battery; on the left when the right section leads, and on the right when in the reverse order. The position of the battery commander, on the right or left, is reversed by the command. ***File closers on the left (right) flank.***

(2) *Platoon commanders* (*reconnaissance officer*).—Each four paces from the flank of his platoon, opposite its center, and on the same flank as the battery commander.

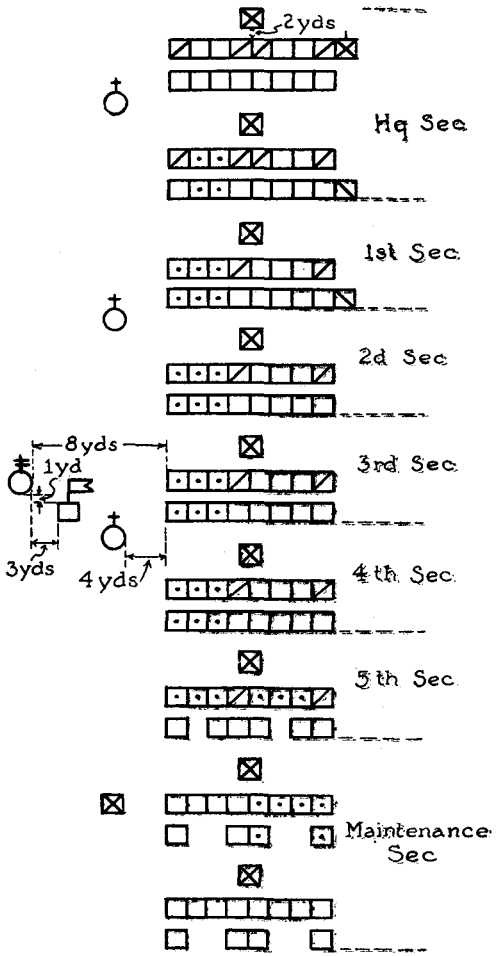


FIGURE 15.—Battery in column of sections.

(3) *Chiefs of section.*—Each two paces in front of the center of his section.

(4) *The first sergeant.*—In file closers abreast of the leading rank.

(5) *Guidon.*—Three paces to the right and one pace to the rear of the battery commander.

(6) *File closers.*—On the flank opposite the battery commander abreast of the ranks of their respective sections and at normal interval therefrom.

c. In column of squads (fig. 16).—Same as in *b* above, with the following exceptions:

(1) *Chiefs of section.*—Each abreast of the leading rank of his section, at normal interval and on the flank of the file closers, excepting chiefs of section acting as right and left guides of the battery.

(2) *Guidon.*—As shown in Figure 16.

62. To form the battery.—*a.* At the sounding of *Assembly*, the first sergeant takes position six paces in front of and facing the point where the center of the battery is to be, and commands: ***FALL IN.*** At this command, the chiefs of section place themselves on a line four paces in front of the first sergeant, facing the battery, in their proper order and at sufficient intervals for the formation of their sections, the center of the interval between the chiefs of the 2d and 3d sections being opposite the first sergeant. Each section forms in normal formation, two paces from, and facing its chief of section. The first sergeant causes the sections to close if necessary.

b. The first sergeant then commands: ***CALL ROLLS.*** At this command the chiefs of section call the rolls, and then face the front.

c. The first sergeant then commands: ***REPORT.*** At this command, the chief of the headquarters section salutes and reports, "Headquarters section, present," or "Headquarters section, corporal ———— and private ———— absent." The first sergeant, having received and verified this report, returns the salute. The chief of the 1st section then reports in like manner, and so on. Men who are known to be absent by proper authority are not reported by chiefs of section.

d. The first sergeant then faces about, salutes the battery commander, and reports, "Sir, the battery is present or ac-

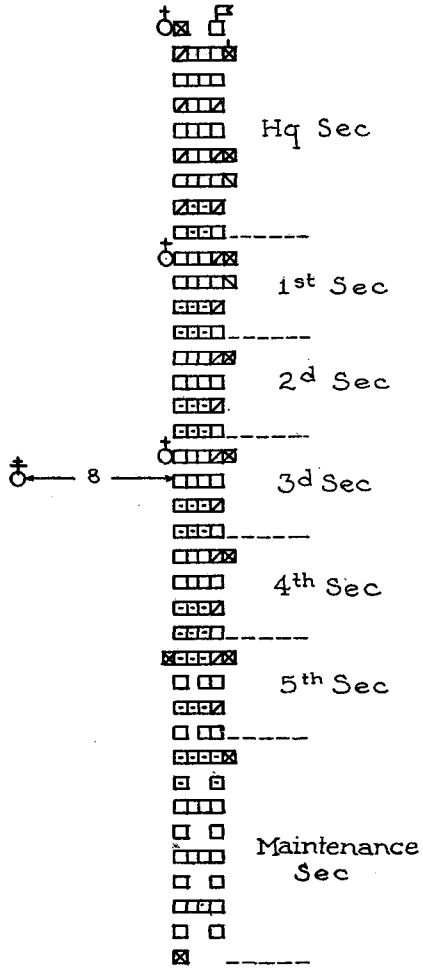


FIGURE 16.—Battery in column of squads

counted for," or "Sir (so many) noncommissioned officers and privates absent," and, without command, takes his post.

e. The battery commander places himself eight paces in front of the center of and facing the battery, superintends the formation, and receives the report of the first sergeant, whose salute he returns.

f. Lieutenants take post four paces in front of the center of their platoons as the first sergeant reports.

63. To dismiss the battery.—The battery being in line at a halt, either in the normal or march formation, the battery commander directs the first sergeant, "Dismiss the battery." The lieutenants fall out; the first sergeant moves to a point six paces in front of the center of the battery, faces and salutes the battery commander, who returns the salute; the first sergeant then faces toward the battery and commands: ***DISMISSED.*** In exceptional cases the battery may be dismissed from any formation, either at a halt or marching.

64. To rectify the alignment.—*a.* The battery being in line at a halt, to align the battery the command is: 1. ***Right (left),*** 2. ***Dress,*** 3. ***FRONT.*** The command is executed by men in ranks as prescribed in the drill of the squad. The battery commander dresses, in order, the front rank, rear rank, line of file closers, line of chiefs of section (when in normal formation) and line of platoon commanders, from positions four paces from the flank toward which the dress is being made and in prolongation of the rank being dressed. From his position when dressing the platoon commanders, that is, on the line of the platoon commanders and facing them, the battery commander gives the command: ***FRONT.***

b. During the dressing of the front and rear ranks, the platoon commanders face the ranks and assist the dressing by cautioning those men to whom the battery commander speaks. As soon as this is completed, platoon commanders face the front and dress to the right, turning their heads to the front as soon as they have their alignment. The chiefs of section (when in normal formation) and file closers dress to the right in a similar manner to the men in ranks with the exception that they do not raise their arms.

65. To rectify the column.—The battery being in column of sections at a halt, if sections have not their proper distances or do not cover and it is desired to rectify the column, the battery

commander commands: 1. *Right (left),* 2. ***DRESS.*** Chiefs of sections in rear of the leading section place their right front rank files so as to cover at the proper distances; each chief of section aligns his section to the right, commands ***Front,*** and takes his post.

66. To execute on right (left) into line.—*a.* The battery being in column of sections, the command is: 1. ***On right (left) into line,*** 2. ***MARCH,*** 3. ***Battery,*** 4. ***HALT,*** 5. ***FRONT.***

b. At the first command the chief of the leading section commands: ***RIGHT TURN.*** If at a halt, the chiefs of the sections in rear command: ***FORWARD.*** If marching, they caution ***Continue the march.*** At the second command the leading section turns to the right on a moving pivot. The command ***Halt*** is given when the leading section has advanced the desired distance in the new direction. At this command the leading section halts and the chief of section takes his post and commands: 1. ***Right,*** 2. ***DRESS.*** The sections in rear continue to march straight to the front. Each executes right turn, at the command of its chief, when opposite the right of its place in line. The chief of section takes his post immediately prior to the arrival of his section on the line, halts his section on the line and commands: 1. ***Right,*** 2. ***DRESS.*** Sections dress on the first section in line. As soon as the last section has arrived upon the line, the battery commander verifies the alignment of the battery and commands: ***FRONT.***

c. The battery being in column of squads, the movement is executed in a manner similar to that explained for the platoon in Basic Field Manual, Volume II.

67. To execute front into line.—The battery being in column of squads or sections, the command is: 1. ***Right (left) front into line,*** 2. ***MARCH,*** 3. ***Battery,*** 4. ***HALT,*** 5. ***FRONT.*** When in column of squads, this movement is executed as prescribed for the section in column of squads. When the battery is in column of sections, the chiefs of section conduct their sections on the new line by the same commands as are used in the squad movements, substituting "section" for "squad." The battery commander dresses the battery and gives the command ***Front,*** in both cases. When executed from column of sections each chief of section other than the chief of the leading section takes his post prior to halting his section.

68. To form line to a flank.—*a.* The battery being in column of squads, the command is: 1. ***Squads right (left)***, 2. ***MARCH***, 3. ***Battery***, 4. ***HALT***.

b. The battery being in column of sections, the command is: 1. ***Sections right (left)***, or 1. ***Sections right (left) turn***, 2. ***MARCH***, 3. ***Forward***, 4. ***MARCH***, or 3. ***Battery***, 4. ***HALT***.

69. To change direction.—The battery being in column of sections, the command is: 1. ***Column right (left)***, 2. ***MARCH***. At the command ***Column right***, the chief of the leading section commands: ***RIGHT TURN***. At the command ***March***, the leading section turns to the right on a moving pivot. The other sections change direction at command of their respective chiefs of section in such manner that their right front rank files cover the right front rank files of the preceding sections. If executed from a halt, at the first command chiefs of section in rear give the command: ***FORWARD***.

70. Close column.—*a.* A battery is in close column when formed in column of sections at distances of four paces, measured from the back of the rear rank guide file in front to the breast of the guide in rear. In close column the battery commander takes post four paces in front of the center of the leading section. Platoon commanders, the first sergeant, the guidon, and the file closers retain the same posts as prescribed for column of sections, conforming, respectively, to the movement of the nearest element of the battery.

b. To form close column, being in column of sections, the command is: 1. ***Close on leading section***, 2. ***MARCH***. The leading section halts or stands fast, other sections close. At the preparatory command, chiefs of section take post on the side of the guide at normal interval.

71. To extend to normal distances.—Being in close column, the command is: 1. ***Extend on rear section***, 2. ***MARCH***. At the command ***March***, the leading section moves straight to the front, and the sections in rear halt or stand fast. They are successively moved forward in time to follow at full distance. At the preparatory command chiefs of section take posts. At the command of execution the battery commander moves to his prescribed post.

72. Route step and at ease when marching.—*a.* (1) *Route step.*—The command is: 1. ***Route step***, 2. ***MARCH***. The men are

not required to preserve silence or to keep step. Ranks cover and distances are preserved. If halted, men stand at rest.

(2) *At ease.*—The command is: 1. ***At ease***, 2. ***MARCH.*** Marching is as in route step, except that silence is preserved; if halted, men stand at ease.

b. Marching in route step or at ease, to resume attention the command is: 1. ***Battery***, 2. ***ATTENTION.***

SECTION V

BATTALIONS AND REGIMENTS

73. General.—*a.* Battalion and regimental movements dismounted are limited to the drills and ceremonies authorized by this manual. Field officers and their staffs may be mounted.

b. The time devoted to the mechanism of drill should be such as to insure precision, smartness, and proper control at the authorized ceremonies.

c. The regimental and battalion commanders give their commands orally, by bugle, by signal, or communicate them by staff officers or orderlies. Each battery commander gives the appropriate commands or orders and causes his battery to execute the necessary movements at his command of execution.

d. At ceremonies units are marched at *attention;* at other times they may be marched *at ease* or at *route step* and stand *at ease* or *at rest,* as the commanding officer may direct.

e. Special units, such as the band, headquarters battery, service battery, and medical detachment conform to the movements of batteries or battalions as may be appropriate.

f. In forming the battalion or regiment the commissioned personnel of the battalion or regimental staff are arranged in line, the executive three paces in rear and one pace to the right of the commander, the adjutant on his left, the remainder of the staff in order of grade from right to left; the noncommissioned staff in line three paces in rear of the commissioned staff. Posts, mounted, are prescribed in paragraph 210*b*.

g. The commander faces the command; subordinate commanders face to the front.

h. Each staff salutes with its commander except where individual reports are made or acknowledged.

i. At the assembly for a battalion or regimental formation, batteries are formed on their own parades and informally inspected.

74. Formations.—*a. The battalion* (fig. 17).—(1) The formations of the battalion are: *Line* (batteries in line); *column* (column of batteries, batteries in line); *close column* (batteries at reduced distances); *line of close columns* (batteries in close column); *column of sections* (column of batteries with batteries in column of sections); *column of squads.*

(2) The batteries are generally arranged from right to left in alphabetical order, except that the headquarters battery and combat train (peace organization) are normally formed on the right. When the battalion headquarters and the combat train are separated (war organization), the headquarters battery takes post on the right of the battalion and the combat train on the left. This arrangement may be varied by the battalion or higher commander.

(3) In whatever formation the battalion may be, the batteries are designated numerically from right to left in line, and from head to rear in column (first battery, second battery, etc.). In dismounted formations and drill, the combat train (war organization) is considered a battery for convenience in designation and ease in giving commands. In addition, the designations *right* and *left* when in line, or *leading* and *rear* when in column, may be used. Either in line or in column, the designation *center* may be used where no misunderstanding may result.

b. The regiment (fig. 18).—(1) The formations of the regiment are: *Line of battalion columns* (line of battalions in close column); *line of close columns* (line of battalions in line of close columns); *column of close columns* (column of battalions in close column); *column of squads; column of sections* (column of battalions in column of sections); and *column* (column of battalions, battalions in column). The line of battalion columns and the column of close columns are employed normally in ceremonies of large commands.

(2) Unless otherwise directed, the battalions are posted from right to left, or from head to rear, according to the rank of the battalion commanders present, the senior on the right or at the head.

(3) In whatever formation the regiment may be, the battalions retain their permanent designations of *first*, *second*, and *third* battalion. In addition, the designation *right* and *left*, when in line, or *leading* and *rear*, when in column, may be used.

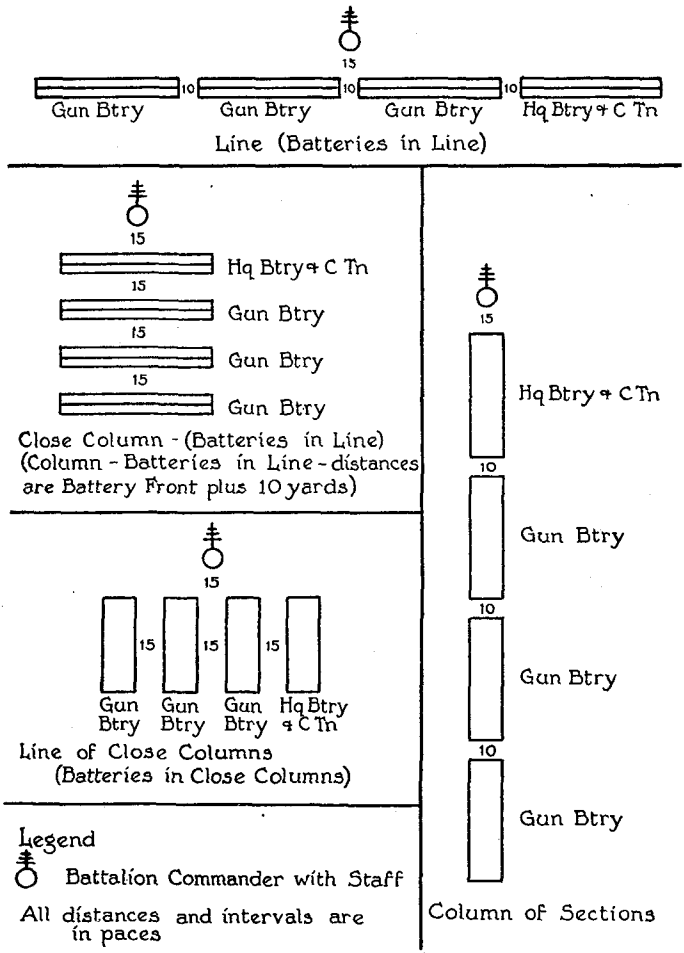


FIGURE 17.—*Formations of the battalion (dismounted) (peace organization)*

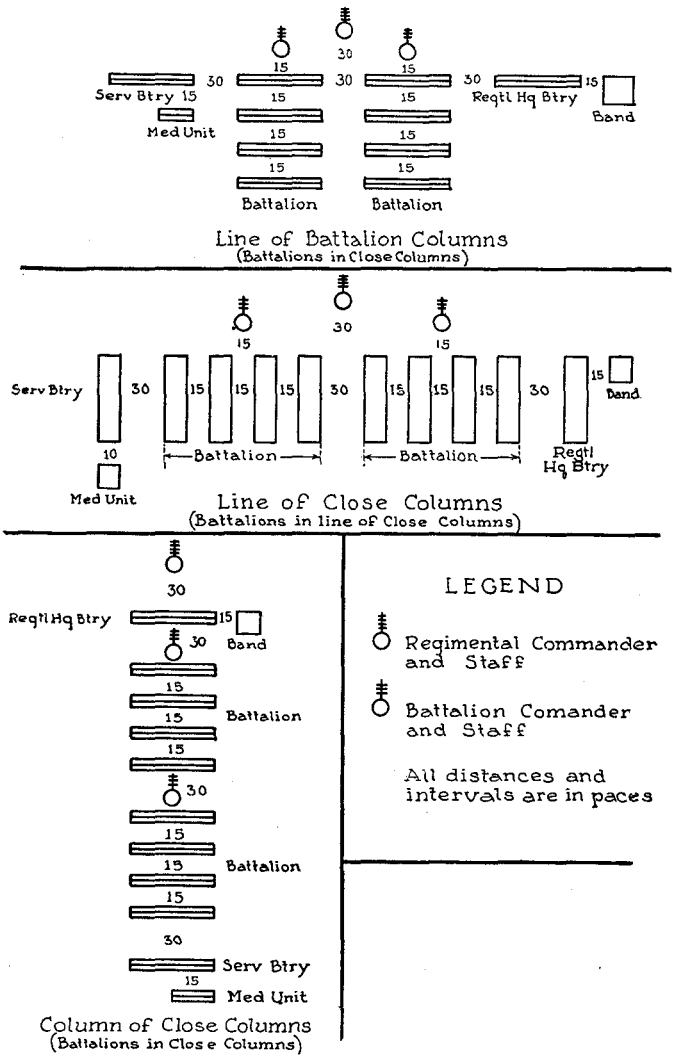


FIGURE 18.—Formations of the regiment (dismounted) (peace organization)

Either in line or in column, the designation *center* may be used where no misunderstanding may result.

(4) The band is formed and drilled as prescribed in Basic Field Manual, Volume II.

(5) The medical detachment, less medical personnel on the staff, takes position 12 paces in rear of the service battery.

(6) No close-order drills, as such, are prescribed for the regiment. To assume any formation, the regimental commander indicates the dispositions desired. The battalions and special units then move by the most suitable means and route, and are disposed as ordered.

75. To form the battalion.—*a. Close column.*—(1) The adjutant informs the battery commanders as to the point of rest and the direction of the front. *Adjutant's call* is sounded, or the adjutant signals ***Assemble.*** He then takes post so as to be facing the column when formed and six paces in front of the point of rest.

(2) Batteries form at attention successively from the front in their proper order and places.

(3) Each battery commander, when his battery is in place, salutes the adjutant and, after the adjutant returns the salute, commands: ***AT EASE.*** The last salute having been returned, the adjutant proceeds to a point four paces in front of the battery commander of the leading battery, brings the battalion to attention, faces the battalion commander, salutes, and reports, "Sir, the battalion is formed," and takes post with the battalion staff after his salute has been acknowledged.

b. Ceremonies.—(1) For battalion ceremonies, or when directed, the battalion is formed in line or in line of close columns.

(2) The band, if present, takes post so that its left will be 15 paces to the right of the right battery or leading section of the right battery when formed.

(3) The adjutant takes post so as to be six paces to the right of the point of rest and faces in the direction in which the line is to extend.

(4) *Adjutant's call* is then sounded, and the band plays until the left battery of the battalion has halted on the line. Batteries are halted on the line successively from right to left in their proper order and places. Upon halting, each battery commander dresses his battery.

(5) The battalion commander, accompanied by his staff, takes post 15 paces in front of the center of the battalion.

(6) The adjutant verifies the alignment of the batteries and then takes post facing the battalion commander opposite the center of the battalion, midway between the battalion commander and the line of battery commanders, salutes, and reports, "Sir, the battalion is formed." The battalion commander returns the salute and directs the adjutant, "Take your post, sir." The adjutant takes his post by passing to the battalion commander's right.

76. To dismiss the battalion.—The battalion commander commands: ***DISMISS YOUR BATTERIES.*** Staff and noncommissioned staff officers fall out; battery commanders march their batteries to their respective parade grounds and dismiss them.

77. Movements of the battalion.—*a.* Column of sections is the usual column of march. The maneuvers usually executed are the formation of column of sections, line, and close column. When halted during a maneuver discrepancies in alignments, intervals, and distances are corrected only when directed by the battalion commander.

b. The battalion commander employs commands prescribed for the drill of the soldier, the squad, the section, and the battery with proper substitutions in the designation of units.

78. To form the regiment.—*a.* The regimental commander prescribes the formation, the order of battalions in line or in column, the point of rest, and the direction of the front.

b. The procedure followed in forming the regiment is, with obvious modifications, similar to that prescribed for the battalion. (Par. 75.)

c. The adjutant takes post opposite the center of and facing the regiment midway between the post of the regimental commander and the line of battalion commanders.

d. The regimental commander, accompanied by his staff, takes post 30 paces in front of the center of the regiment facing it, and receives the adjutant's report.

e. The adjutant reports and takes his post in a manner similar to that prescribed in paragraph 75.

79. To dismiss the regiment.—To dismiss the regiment, the regimental commander orders the battalion and special and attached unit commanders to dismiss their organizations. The order may be given directly to the commanders concerned or it

may be communicated to them through staff officers or messengers.

CHAPTER 2

THE ARTILLERY HORSE

80. Care of the horse.—*a. General.*—(1) Field Artillery officers must have a thorough and practical knowledge of how to care for, condition and train the animals assigned to field artillery organizations. All officers should know the symptoms and methods of treatment of diseases common to horses and mules, and have a practical understanding of the principles of shoeing.

(2) Animals require intelligent care in order that their health and strength may be preserved. When used, they must be hard and in physically fit condition. Their training must be such that they will accomplish their work with the minimum expenditure of muscular and nervous energy.

(3) The personnel of a field artillery organization must be carefully instructed in the treatment, stabling, management, watering, feeding, grooming, and exercising of their animals.

b. Rules for the care of animals.—Drivers and individually mounted men must be familiar with the following general rules:

(1) Horses require gentle and quiet treatment. When coming up behind a horse or upon entering his stall, he should be spoken to gently, and approached quietly without sudden or abrupt movements.

(2) A horse must never be struck or threatened about the head, and must never be kicked, struck, or otherwise abused. The whip and spur are aides to be properly used as required.

(3) Before taking a horse out, he should be examined carefully to make sure he is fit for work. This inspection should be for the purpose of determining that his breathing is normal, that he does not rest a fore leg, that there are no lumps or sores on his back or shoulders which would be rubbed or irritated by his harness or other equipment, that there are no stones or nails in his feet, that his shoes are not loose and that he does not go lame on being led out. This inspection should determine whether or not the horse has eaten his food, and his droppings are normal.

(4) (*a*) Before leaving the picket line or stable and before the bit is placed in his mouth a horse should be given the opportunity to drink. In cold weather, bits should be warmed before being placed in the horses' mouths. When starting out, a horse should be walked for the first mile or so, in order to start the circulation in his legs; on returning, a horse should be walked for the last mile or so in order that he may be returned to the stables dry and cool.

(*b*) If a horse is returned to the stables in a heated condition, he should be cooled by being led at a walk and then he should be rubbed down. In cold weather, a horse should be cooled under a blanket; during this cooling period, he may be allowed two or three swallows of water.

(*c*) A horse should never be watered when heated unless the exercise or march is to be resumed immediately; he should not be fed grain when heated or fatigued; hay will not injure him.

(*d*) The saddle and blanket should never be removed from a horse so as to expose a wet back to the direct rays of a hot sun or to a cold wind. When the saddle is removed after a march, the back and legs should be massaged to restore circulation. As an expedient, the dry side of a blanket may be placed against the back and held in place by a loosened cinch or surcingle.

(*e*) A gradual restoration of circulation in the back is essential, hence after a long, fatiguing march the saddle with loosened girth should be permitted to remain on the horse's back for from 15 to 20 minutes.

(*f*) If wet from rain or other causes, a horse should be dried by rubbing with cloth or wisps of hay. Never leave a horse for the night until he is thoroughly dry, especially around his legs, pasterns, and feet.

(5) When leading a horse the soldier should be taught to face away from the horse.

81. Feeding and watering.—*a. Classes of food.*—(1) Food for animals is divided into two general classes: Hay and grain. Of the latter, oats have been accepted as standard for issue in the Army. Other grains, such as corn, barley, rye, rice, and wheat, are solely substitutes.

(2) Bran is an excellent food for animals; not only does it assist in the building up of nerve and muscle but it acts also as a mild laxative. In the form of a mash it should be fed once a week, replacing the evening portion of the grain ration. Dry

bran, mixed with grain, may be fed daily in order to compel the horse to masticate his food more completely. A bran mash is made by steeping 2 or 3 pounds of bran in boiling water, stirring it well, and permitting it to cool. Small quantities of salt may be added as a flavoring.

(3) Salt is necessary for the good health of animals and should be fed in the form of rock or caked salt placed in or conveniently near the manger. The feed box should not be used as a container for salt.

(4) Hay is an essential component of an animal's ration. It can not be wholly dispensed with for any considerable time unless it is replaced by a suitable substitute. An exclusive diet of grain causes intestinal disorders.

(5) In the spring and summer a mixture of chopped green stuff with the usual ration is advisable. Fed in large quantities, green stuffs may cause disorders. When grazing is feasible, it is to be preferred to feeding green foods in the stables.

(6) On account of the "cooling" and laxative effect of green grass, grazing is very beneficial. However, in turning animals out for the first time to graze care must be taken that they do not overeat.

b. Amounts of foods.—(1) For idle animals food should be supplied in sufficient quantities to maintain the weight of the body satisfactorily. Normally, 18 pounds of forage daily for each 1,000 pounds of body weight is sufficient.

(2) For working animals food must be supplied in sufficient quantities not only to retain the body weight but to restore the waste due to muscular effort. Normally, the ration for horses is 10 to 12 pounds of oats and 14 to 17 pounds of hay; for mules, 8 to 10 pounds of oats and 14 pounds of hay. As the work increases the grain ration should be increased, the hay ration remaining the same. Animals should be provided daily with 3⅓ pounds of straw for bedding.

(3) In feeding green stuff with grain, the amount of the former should be limited to one or two pounds. Feeding linseed meal, the allowance is from one-half to one pound daily, mixed with other foods.

c. Principles of feeding.—The following rules regarding feeding are of primary importance: Water before feeding or not sooner than one hour after feeding; do not feed grain to heated animals; feed in small quantities and often; do not work

animals immediately after a full meal; in general, feed hay before grain, or chopped hay (chop) with grain.

d. Methods of feeding and watering.—(1) Artillery animals should be fed three times a day at regular intervals. The morning feed should consist solely of grain and be fed from an hour to an hour and a half before drill.

(2) While the animals are out in the morning the feed boxes, hay racks, and stalls should be thoroughly cleaned. After this cleaning about three pounds of hay should be placed in the racks. After drill, and following stables, the animals should be watered, tied in, and permitted to eat hay. At noon the second grain feeding should be distributed. Upon completion of the noon feed the animals should be tied outside or placed in the corral, except in very hot or inclement weather. After evening water call the animals should be led in and should find the remainder of the hay ration in the racks. About supper call the remainder of the grain ration should be fed. Assuming that 12 pounds of oats are to be fed as a daily ration, 3 pounds should be fed in the morning, 4 at noon, and 5 in the evening.

(3) When animals are overworked and suffering from exposure grain mixed with chaff or chop should be fed five or more times a day, and hay at every opportunity.

(4) According to the temperature and work, animals will require from 5 to 15 gallons of water daily. Animals should not be permitted to drink for at least an hour after feeding, but they may be allowed to drink while at work, even if sweating. As animals frequently will not drink in the early hours of the morning, they should be watered just before harnessing or saddling, provided an hour has elapsed since feeding. Crowding should not be permitted at the watering trough, and no horse should be led from the trough until all animals thereat have finished drinking. Ample time for drinking should be allowed; horses should not be led away as soon as they raise their heads from the water, as they frequently do this to breathe. Restless and kicking animals should be watered separately.

82. Stable management.—*a. General.*—(1) In field artillery organizations the battery commander is responsible for the proper performance of stable duty. (Par. 11.) At least one officer must always be present during stables.

(2) Animals should be assigned stalls permanently, and over each stall should be placed the name of the animal. Similarly,

animals should be assigned permanent positions on the picket lines.

(3) Stables must be provided with the necessary fire equipment, and rules prohibiting smoking in the vicinity of the stables must be enforced rigidly.

(4) Stable tools and feed carts, when not in use, should be kept clean and neatly arranged in a room.

b. Cleanliness.—(1) The floors of stables and aisles should be kept clean at all times. Earthen floors require constant care; depressions should be dug out and filled with cinders or crushed rock bound with fresh clay.

(2) Hay racks and feed boxes should be cleaned daily and thoroughly washed once a month.

(3) Woodwork within reach of animals should be covered with sheet metal or painted with tar. The kicking bar should be provided with some quick-release device at its rear end. All woodwork should be cleaned regularly, using a solution of three tablespoonfuls of lye in a bucket of warm water.

(4) Water troughs should be emptied and cleaned daily. To avoid contagion, sick animals should be watered from buckets.

(5) Corrals should be cleaned daily. Their construction should provide for thorough drainage. Depressions occurring in corrals must be filled promptly.

(6) Standings along the picket line must receive the same attention and care as stall floors. A foundation of stone with a covering of gravel or cinders should be provided.

c. Ventilation.—The proper time to test the ventilation of a stable is in the early morning; if an offensive odor is noticeable, there is not sufficient ventilation. Cold air seldom harms animals; however, avoid placing animals, particularly when warm, in a draft. Only in case of severe weather should windows be closed, and then only on the windward side.

d. Bedding.—The proper bedding of animals is important for their well-being. While the animals are out in the morning, the bedding should be taken up, carefully shaken out, and sorted. Such part as can be used again should be placed where it will air thoroughly. During the afternoon, prior to leading the animals in, the dried bedding mixed with fresh straw, as necessary, should be laid down. The bed should be soft and even, with the thickest part well away from the manger.

c. Grooming.—The objects of grooming are cleanliness, prevention of disease, and improvement in condition and appearance.

(1) *Grooming kit.*—The grooming kit consists of the currycomb, hoof hook, horse brush, and grooming cloth, sometimes augmented by the dandy brush and wisp.

(*a*) The currycomb is used to clean the horse brush, to remove caked mud, and to loosen matted scurf and dirt. It should be applied gently. The currycomb should never be used on the legs from the knees and hocks down, or about the head.

(*b*) The hoof hook is used to remove dirt and gravel from the region of the frog and the sole. Care should be exercised that the point of the hook when used down the side of the frog does not tear or break the tissue. Hoofs may be washed, when necessary, taking care not to wet the legs, as this may result in scratches.

(*c*) The horse brush is the principal tool in grooming. It should be applied with the arms stiff, the weight of the body being thrown into each stroke. After every few strokes the brush should be cleaned with the currycomb.

(*d*) The grooming cloth is used to wipe the eyes, nostrils, and lips; to rub the head, ears, and muzzle; to remove dust and sweat from the soft skin behind the elbows, under the flanks, and between the hind quarters; to polish the coat; and to clean the dock and the outside parts of the sheath. The cloth should be thoroughly cleaned at least once a week, and disinfected from time to time.

(*e*) The wisp consists of a handful of straw or hay suitably twisted and folded. It is used to dry wet animals and to remove mud from the legs and head. It is applied by rubbing energetically forward and backward well into the coat. The coat should be laid flat after finishing with the wisp.

(2) *Order of grooming.*—Grooming is begun on the near side; the horse brush, or dandy brush, being held in the left hand, the currycomb in the right. Beginning at the neck, pass to the breast, then the withers, shoulders, and near fore leg down to the hoof; next the back, side, belly, loin, flank, croup and near hind leg down to the hoof, in the order named. Having completed grooming on the near side, pass to the off side, changing the brush to the right hand and the currycomb

to the left. The order of grooming is the same as that indicated for the near side. While grooming with the brush, the currycomb may be used, as necessary, to remove caked mud or loosen matted hair. Having completed the grooming indicated above, brush the head, mane, and tail. In brushing the mane and tail, begin brushing at the end of the hair and work up to the roots. Next clean out the feet with the hoof hook. Finally, using the grooming cloth, the face, eyes, nostrils, and dock should be wiped and the entire animal gone over, paying particular attention to the soft-skin parts of the body. Grooming may be done by detail, appropriate commands being given by the officer in charge.

(3) *Inspection of grooming.*—To inspect the grooming, the hand should be passed the reverse way of the hair to get a view of the skin. If the grooming has not been performed properly lines of gray will be left on the coat where the fingers have passed over, and scurf will adhere to the fingers. During an inspection particular attention should be paid to the following parts of the animal, which are apt to be overlooked in grooming: Between the branches of the lower jaw, under the crown piece of the halter, the knees and hocks, under the belly, under the breast between the forelegs, and under the thighs.

(4) *Adjuncts to grooming.*—In addition to grooming, the following are of importance:

(*a*) The mane and tail should be washed occasionally with warm water and soap. To improve the appearance of animals the manes and tails should be plucked, the length of the tail being such that it will reach to the point of the hock when the animal is in action. Hogging the mane may be employed to improve the appearance of animals. In southern and tropical climates the forelock may be left to afford natural protection to the eyes. In hogging the manes of draft animals the hair should not be removed from the collar seat.

(*b*) The fetlocks should be neatly trimmed, but not cut too close.

(*c*) Washing animals is strongly to be condemned. After strenuous work, animals may be sponged off provided they are then dried properly.

(*d*) The sheaths of animals require careful attention; particularly is this true in warm climates. To clean, first remove accumulated material, then wash with warm water and castile

soap. To avoid injuring the tissue the finger nails should be cut short and smoothed off.

(*e*) Horse covers are not an absolute essential; if used, they should be worn while at rest only. Their main uses are to improve the appearance of the horse, to cover horses recently clipped, and to provide additional warmth to sick animals.

83. Conditioning.—*a.* Condition refers to the bodily health, muscular strength, and power of endurance to perform the work required without injury. Conditioning a horse requires proper feeding and stable management and a regular course of graduated exercises.

b. The best conditioning is based on walking with full pack and equipment; however, in combination with walking there should be brief periods at the trot and still shorter periods at the gallop. Work should be light in character but long in time; an hour and a half to four hours daily is considered essential. The work should never be so severe as to produce undue fatigue.

c. Animals in good condition should be able, under favorable conditions of road and weather, to perform the following tests without undue fatigue:

(1) Riding animals with full pack, a maneuver gallop for 15 minutes, or a march of 25 miles in five hours.

(2) Pack animals, with a 200-pound net load, an ambling gait at the rate of six miles an hour for 20 minutes, or a march of 25 miles in seven hours.

(3) Light or horse artillery teams with full equipment, the maneuver trot for 20 minutes, or a march of 25 miles in six hours for light and in five hours for horse artillery; wagon teams with full equipment, the trot for 20 minutes, or a march of 25 miles in eight hours.

d. All animals should be in excellent condition before going on marches or extended maneuvers.

CHAPTER 3

THE ARTILLERY DRIVER

SECTION I

GENERAL

84. Object of instruction.—The object of instruction is the training of the field artillery driver in harnessing and unharnessing; in the proper fitting, cleaning, and care of harness; and in the managing and maneuvering of a single pair and the different pairs of a team in draft. Instruction mounted, without arms (Basic Field Manual, Vol. V), should precede the instruction of the artillery driver.

85. Terms.—The two horses assigned to a single driver are called a *pair;* the horse on the left side is called the *near horse,* and the horse on the right the *off horse.* The driver rides on the near horse. The pairs assigned to draw a carriage are termed collectively a *team.* A team usually consists of three pairs, designated in the order from front to rear, *lead, swing,* and *wheel pair.* When a team consists of four pairs they are designated from front to rear, *lead, lead swing, wheel swing, wheel.* The middle pair of a team of five pairs is called the *middle swing pair.* The driver *stands to horse* on the near side of his near horse, and when necessary to control the off horse also holds the coupling rein, detached from the saddle, in his right hand.

SECTION II

HARNESSING AND UNHARNESSING

86. Nomenclature of harness.—The nomenclature of field artillery harness is indicated in Figure 19.

87. Disposition of harness in garrison.—The harness of a pair is arranged on two pegs and two spikes, fastened to the heelpost. On the upper peg is placed the off saddle with its attachments over the seat; the blanket across the saddle, folded edge next to the pommel; the collar on the blanket, bearing surface down, neck strap and pad away from the heelpost. On the lower peg, the near saddle and harness arranged as prescribed for the off harness. The neck yoke, with martingales attached, and both bridles are hung on a spike driven into the side of the heelpost at the height of the upper peg. The traces are hung on a spike placed above the upper peg. The harness sack covers all the harness on pegs. If the harness pegs are on the left heelpost (facing the manger), the cantles of the saddles

are placed against the heelposts, otherwise the pommels are against the heelpost.

88. **To harness.**—*a. By detail.*—The drivers standing to heel, the instructor gives in succession the commands indicated below. As each command of execution is given the drivers perform the duties specified and then stand to heel awaiting the next command. After his pair is harnessed, each driver stands to horse. 1. ***By detail,*** 2. ***HARNESS.*** Remove the harness sack. 3. ***COLLAR.*** Beginning with the off horse, remove its collar from the peg; unsnap the halter tie rope; place the collar, body up, over the horse's head, and then turn the collar over so that the neck strap, collar pad, and body of the collar will be in place; snap the halter tie rope to the halter. In a similar manner place

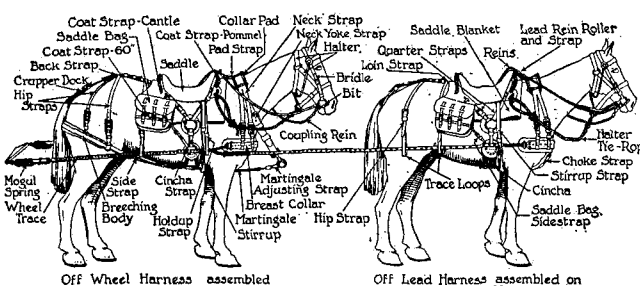


FIGURE 19.—Nomenclature of field artillery harness

the near collar on the near horse. 4. ***SADDLE.*** Put the blanket on the off horse and then the saddle with its attachments; buckle the pad strap to the saddle; turn back the back strap and, in the case of the wheel harness, the breeching; fasten the crupper and complete the saddling. Saddle the near horse in like manner. 5. ***TRACES.*** Lay the middle of the traces of the off horse over the horse's back behind the saddle, toggles on opposite sides; beginning with the off trace, pass the toggles through the trace loops from the rear and attach them to the **D** rings on the collar. Attach the traces of the near horse in a similar manner. The rear ends of the traces are left hanging over the backs of the horses, except that, when harnessing for drill by pair, these ends may be brought forward and fastened to the toggles of the opposite traces at the **D** rings of the col-

lars. Traces may be left off when harnessing for drill by pair. 6. ***BRIDLE.*** Bridle the off horse; secure the roller, and then bridle the near horse. Unless otherwise instructed, halters are removed before bridling. 7. ***COUPLE.*** Turn the pair about so as to face the stable driveway and attach the coupling rein to the off ring on the pommel of the near saddle. 8. ***YOKE.*** The wheel driver takes down the neck yoke and places himself between his horses, facing in the same direction with them; he fastens the neck yoke strap of the off horse, then that of the near horse; passes the martingale of the near horse between the forelegs and through the standing loop on the cincha; attaches the hooks at the ends of the side straps to the martingale **D** ring; secures the martingale of the off horse similarly; then passes out in rear of the near horse.

b. Without detail.—The command is: ***HARNESS.*** At this command, the drivers harness, following the successive steps prescribed in *a* above.

89. To unharness.—*a. By detail.*—The commands are as indicated below; each driver at the command of execution performs the duties indicated and then stands to heel awaiting the next command. 1. ***By detail,*** 2. ***Unharness,*** 3. ***UNYOKE.*** At the third command, the wheel driver passes between his horses from the rear and, beginning with the near horse, unhooks the side straps and draws the martingales through the standing loops on the cinchas; unsnaps each neck yoke strap and hangs the neck yoke on its spike. 4. ***UNCOUPLE.*** Each driver uncouples. If the horses are facing the stable driveway, they are turned to face the manger. 5. ***UNBRIDLE.*** Unbridle the near horse; halter and tie to the manger; hang the bridle on its spike. Release the lead rein roller and unbridle the off horse. 6. ***TRACES OFF.*** Disengage the near trace of the near horse and lay its middle over the saddle, toggle on the near side; disengage the off trace and lay it beside the near trace, toggle on the off side; place the traces on their spike. Similarly remove and hang up the traces of the off horse. 7. ***UNSADDLE.*** Beginning with the near horse, unfasten the crupper and place the attachments in the saddle; unfasten the pad strap; unsaddle and place the saddle on the lower peg; remove the blanket and place it over the saddle. Unsaddle the off horse in like manner. 8. ***COLLAR OFF.*** Unsnap the tie rope and remove the collar of the near horse, then secure the tie rope.

Similarly remove the collar from the off horse. Lay each collar across the saddle above the blanket. Cover the harness.

b. Without detail.—The command is: ***UNHARNESS.*** At this command, the drivers unharness, following the steps indicated in *a* above.

SECTION III

ADJUSTMENT AND CARE OF HARNESS AND HORSE EQUIPMENT

90. Instruction of drivers.—Drivers must be impressed with the importance of constant and unremitting attention to the adjustment and fit of harness. They must be made to appreciate that every sore and every abrasion are due to a cause which must be removed. Injuries, whatever the cause, must be noted at once and reported to a responsible officer.

91. Adjustments.—*a. Collar.*—The lower edge should be just above the point of the shoulder. The choke strap, which may be left off the harness when so directed by the battery commander, is adjusted so as to prevent the collar from slipping up and bearing on the windpipe. The forks of the neck strap should keep the body of the collar horizontal when in draft.

b. Back strap.—This strap should admit the breadth of the hand between the strap and the horse's back, and the ring should be at the highest part of the croup.

c. Pad strap.—This strap should be loose; its sole function is to prevent the collar pad from falling when the horse lowers his head.

d. Hip straps and breeching body.—The straps should permit the breeching body to slope forward and downward in prolongation of the side straps, the upper part of the body about 3 inches below the point of the buttocks.

e. Side straps.—These straps should be short enough to cause the breeching body to bear quickly should the horse be required to check the carriage, but not so short as to impede the animal's movements when in draft.

f. Martingale.—The adjusting strap of the martingale should be of a length to hold the D ring safe on the martingale, well through the standing loop on the cincha.

g. Neck yoke.—The neck-yoke straps should not carry the weight of the pole but should be sufficiently tight to prevent undue lateral displacement of the pole.

h. Loin straps.—These straps should be adjusted so that in draft the traces will be straight and without downward pull on the trace loops, the bottoms of which should be 2 inches below the traces.

i. Traces.—The rule for lead and swing pairs is to allow about 1 yard from head to point of buttocks when in draft. The length of the wheel traces is fixed. Care must be exercised that the lengths of the traces for any one horse are the same.

j. Coupling rein.—This rein should be loose enough not to interfere with the off horse when he is turning to the right in draft, but still tight enough to check him if he starts to swing out from the near horse.

k. Hold-up straps.—These should insure a horizontal line of draft of the traces in front of the hold-up straps so as to prevent pressure on the wheelers' necks from draft of lead and swing pairs. .

l. Bridle, saddle and surcingle.—See Basic Field Manual, Volume V.

92. Cleaning and care of harness and horse equipment.—*a. General.*—Harness and horse equipment should be kept clean, serviceable, and in good repair; leather parts soft and pliable; metal parts free from rust and dirt, with appropriate parts painted. All cleaning should be under the immediate supervision of an officer. Harness and horse equipment should habitually be cleaned immediately after use; ordinarily about 30 minutes should be allowed for unharnessing and care of equipment. Bits and all leather parts of the harness should be wiped with a damp cloth, the bits then being dried and rubbed with an oil-moistened cloth. Broken or unserviceable parts of the equipment should be repaired or replaced.

b. Saddle blankets.—These should be kept soft, clean, and free from wrinkles. Occasionally they should be hung out in the sun and then brushed. When necessary, blankets should be thoroughly cleaned by repeated immersions in tepid water and then, without wringing or pressing, hanging them up to dry.

c. Periodic cleaning.—At intervals from one to two weeks, depending upon climatic conditions and the nature of the service, harness should be taken apart completely, thoroughly overhauled, cleaned, and dressed. Appropriate metal parts, such as trace chains, should be painted; other metal parts, including

buckles, should be cleaned, and the leather equipment cleaned and dressed, as prescribed in Basic Field Manual, Volume V.

d. Cleaning by detail.—Cleaning may be by detail, an officer or noncommissioned officer inspecting each article cleaned before permitting the driver to proceed to the next. The order of cleaning by detail is as follows: (1) Blanket, (2) bridle, (3) saddle with attachments, (4) collar with attachments, (5) traces.

SECTION IV

PRELIMINARY MOUNTED INSTRUCTION

93. Intervals and distances.—The length of the horse is assumed to be 3 yards, and a hitched carriage, with a 3-pair team, 17 yards.

a. Intervals.—Between pairs in line, 3 yards; between teams in line, 3 yards for each pair; between hitched carriages, one hitched carriage length.

b. Distances.—Between pairs in column, 1 yard; between teams in column, 2 yards; between hitched carriages, 2 yards.

94. Formations.—The carriages of a section are in section column when one is in rear of the other at proper distance; in flank column when abreast of each other at the prescribed interval; and in double section when abreast of each other at 2 yards interval.

95. To lead out.—Horses being harnessed, the instructor indicates the order for leading out and the place for and character of the formation, and commands: ***LEAD OUT;*** or 1. ***First (or such) section,*** 2. ***LEAD OUT;*** or 1. ***To your carriages,*** 2. ***LEAD OUT;*** or 1. ***First (or such) section,*** 2. ***To your carriages,*** 3. ***LEAD OUT.*** At the command of execution, animals are led out, the drivers, when necessary, holding in the right hand the coupling rein which is detached from the near saddle.

96. To mount and dismount.—*a. At a halt.*—The command is: 1. ***Drivers prepare to mount (dismount),*** 2. ***MOUNT (DISMOUNT);*** or 1. ***Drivers,*** 2. ***MOUNT (DISMOUNT).*** Having mounted, the driver takes the whip and hangs it by the loop from his right wrist; he then takes the lash of the off bridle reins in his left hand, the lash coming in under the little finger and passing out over the forefinger.

b. Marching.—Being at a walk, the command is: 1. ***Drivers,*** 2. ***DISMOUNT.*** Without checking the pace, the driver dismounts, places the bridle reins of his horse over the pommel and walks

beside his animal without touching the reins, unless necessary to guide or steady the pair. The instructor may command: 1. ***Lead and swing drivers,*** 2. ***DISMOUNT.*** Ordinarily drivers do not mount while marching.

97. Alignments.—The base unit being established in position, the command is: 1. ***Right (left),*** 2. ***Dress,*** 3. ***FRONT.*** At the command ***Dress,*** drivers, other than the base driver or drivers, look to the flank designated and align themselves. At the command ***Front,*** eyes are turned to the front. The instructor may supervise the alignment from either flank.

98. Guides.—*a.* As soon as the march in line has begun, the instructor designates one of the flank elements as guide of the movement, thus, ***Guide right (left).*** Other elements align themselves on the guide and maintain their intervals from that flank. Guides are responsible that the direction and rate of march are properly maintained.

b. Marching in column of pairs, teams, or carriages, or marching obliquely, the leading element is without indication the guide.

c. The guide of a team or carriage is the lead driver. The guide of a section in section column is the guide of its leading carriage; in double section, the guide of its left carriage.

99. Rests.—When dismounted, the driver remains close to his pair, either standing to horse or holding the reins of his horse. The duties of the driver on the march during a period of rest are given in paragraph 240.

100. To hook and unhook traces.—Teams being in proper order in column of pairs, at the command ***Hook traces,*** each lead and swing driver goes to the rear of his off horse, by the off side, and hooks traces beginning with the outer trace of the off horse and ending with the outer trace of the near horse. At the command ***Unhook traces,*** the drivers indicated above unhook traces in the reverse order of hooking traces, first going to the rear of the near horses by their near sides. As each trace is unhooked it is laid over the horse's back in rear of the saddle.

101. To post teams with carriages.—The command is: ***TEAMS TO YOUR CARRIAGES.*** The teams proceed direct to their carriages. When the team reaches its proper position the wheel driver commands: 1. ***Team,*** 2. ***HALT,*** and places his pair for hitching. If the traces have not been hooked prior to leading out, they will be hooked before hitching.

102. To hitch.—*a. Drivers.*—The command is: 1. ***Drivers,*** 2. ***HITCH.*** Each wheel driver, passing behind the near horse, places himself on the right of the pole between his horses and engages the end of the pole in the pole ring of the neck yoke; he then attaches the traces of the off horse, beginning with the near trace; moving at a double time around the carriage, he then fastens the traces of the near horse, beginning with the off trace.

b. Cannoneers.—The command is: 1. ***Cannoneers,*** 2. ***HITCH.*** The cannoneers posted nearest the wheels of the limber hitch the wheel horses on their respective sides, beginning with the traces nearer the pole; the cannoneer on the left side engages the end of the pole in the pole ring of the neck yoke prior to hitching.

103. To unhitch.—*a. Drivers.*—The command is: 1. ***Drivers,*** 2. ***UNHITCH.*** Each wheel driver unhitches, performing the operation in the opposite order from that indicated for hitching. As traces are unfastened, their ends are passed over the horses' backs behind the saddle or secured to the breeching body, as may be directed. Having unhitched, the drivers mount, if the command for dismounting has not been given, otherwise they stand to horse.

b. Cannoneers.—The command is: 1. ***Cannoneers,*** 2. ***UNHITCH.*** The cannoneers nearest the limber wheels unhitch on their respective sides, the cannoneer on the left side disengaging the pole.

104. To dismiss the drivers.—Teams being unhitched and traces unhooked, the command is: 1. ***By the right (left) (right and left),*** 2. ***FILE OFF,*** or ***FALL OUT.*** At the command ***File off,*** drivers execute the movement by pairs, teams, or sections, depending on the formation. The leading driver, or drivers, on the designated flank, or flanks, initiates the movement. If the command is ***Fall out,*** drivers lead their teams directly to the place designated for unharnessing.

SECTION V

MANAGEMENT OF THE PAIR

105. General.—The driver rides the near horse, which is managed by the legs, reins, and weight; the off horse is managed by the bridle, reins, and whip. The voice, used quietly, is of special service in managing the pair.

106. Use of the whip.—While driving, the whip is carried hanging from the right wrist; at ceremonies it is carried pointing obliquely to the left over the driver's left forearm. Before dismounting the whip is inserted in the near pommel ring of the near saddle. The whip, applied by gentle taps on the left shoulder of the off horse, should cause him to move his forehand to the right; applied on the right shoulder, it should cause him to move his forehand to the left; applied on the near side slightly in rear of the place for a rider's leg to act, it should cause him to move his haunches to the right; applied similarly on the off side, his haunches should move to the left; applied behind the saddle on the croup near the right hip, it should cause him to move straight to the front, remaining close to his mate. Any use of the whip other than the above will be detrimental to draft.

107. The voice.—This aid must be reserved for occasions when it is needed to produce a definite effect. A low chirrup or cluck, used in connection with the other aids, serves to attract the horse's attention and to increase the gait. It is effective in keeping the horse in the collar in a heavy or difficult pull. A low, quiet "whoa," used in connection with the aids, assists in decreasing the gait or halting the horse. A gentle reassuring tone may be used to calm a frightened animal.

108. Reins of the off horse.—These reins are used to gather, steady, and halt the off horse, check his gait, and rein him back. When necessary to apply some force on these reins, the driver draws them toward his right thigh, using the right hand, but still holding the lash in the left hand. To assist in turning an untrained horse to the right the driver may reach over with his right hand and apply the right rein direct. The coupling rein may be used to turn the off horse to the left but it must not be used to check his gait. The driver should never use the lash of the off rein as a whip.

109. Maneuvering the pair.—Drivers are instructed in managing and maneuvering a single pair before their training with teams hitched and in draft is begun. The near horse is gathered as explained in Basic Field Manual, Volume V; the off horse by a slight pressure or slight additional pressure on the bit. When maneuvering the pair both horses should be gathered before moving from a halt, before halting, and before changing gait or direction. In changes in direction, the horse on the inside moves over the arc of a circle of which the radius

is 6 yards. The horse on the outside of the turn must quicken his movements slightly, but should be held behind the inside horse until the turn is completed.

110. Maneuvering the team.—Following instruction in maneuvering the pair, teams are formed with traces unhooked, and the drivers are instructed in the commands and movements pertaining to the team hitched. This instruction is continued with the traces hooked, to the end that the drivers will be prepared to take up the management of their horses in draft.

SECTION VI

DRAFT

111. General.—The mobility of a battery depends upon its draft efficiency. Care should be exercised in the pairing and teaming of horses; in general, the heaviest pair of a team should be placed in the wheel position, and the tallest pair in the lead.

112. Changing gaits.—*a.* In starting a carriage, all horses of a team simultaneously should apply power to their collars. At the preparatory command, drivers gather their horses and stretch their traces; at the command of execution, drivers apply the proper aids, causing their horses to respond by stepping slowly into their collars. The same general principles apply in increasing the speed of the carriage in passing to a faster gait and in changing direction.

b. In stopping the carriage, drivers hold their horses out of draft and halt with the gradual stopping of the carriage. The wheel driver may assist in stopping the carriage by holding his horses back in the breeching. The brake, applied carefully and gradually, should be used habitually in stopping and in slackening the speed of the carriage.

113. Backing.—Backing should be avoided if possible. The wheel driver is responsible for backing the carriage, the other drivers giving him complete liberty of trace.

114. Turns.—In making turns, the lead driver directs his pair so that the horse on the inside of the turn moves over the arc of a circle of which the radius is 6 yards. Moving at increased gaits, the radius is increased sufficiently to permit the horses to execute the movement with ease and the gait is moderated when necessary to avoid overturning carriages.

115. To turn in limbering.—*a.* The limber is brought squarely across the trail so that the inside wheel will pass

within about 1 foot of the lunette. When the heads of the wheel horses are opposite the lunette the lead driver turns his pair as sharply as practicable away from the lunette through 180° and moves in the new direction until he is approximately opposite the lunette, where he turns his pair to the right through 90°. The wheel driver continues straight across the trail with his pair until the axle is opposite the lunette. He then turns his pair on the center of the axle as a pivot. The swing pair conforms to the movement of the lead pair.

b. The lead driver slowly straightens his pair in direct prolongation of the trail, and the swing and wheel drivers follow his movements by slowly swinging their horses toward the same line. When the horses are straight on this line, the turn, if properly made, should have placed the pintle of the limber in prolongation of the trail. The wheel driver then backs the limber as much as may be necessary to permit limbering. Throughout the movement it is essential that the traces of the lead and swing pairs remain loose. They are stretched the moment the limbering is completed.

116. Training in draft.—*a.* A horse will not pull unless he is confirmed in the belief that when he applies his strength the load behind him will yield. To allow repeated trials and failures in pulling ruins the draft efficiency of a team. During a difficult pull a team may be permitted to stop and rest. While the horses are resting sufficient cannoneers should be brought up to assist in starting the carriage when the signal to move is given. During a heavy pull horses should be allowed full freedom of rein. At times it will be advantageous to mount cannoneers on the off horses, as horses can exert a greater power of traction when ridden. Teams should not be permitted to rush a hill or other difficult pull. A steady, uniform walk is the best gait.

b. Cannoneers should be instructed and practiced in assisting the horses by working on the wheels and on ropes attached to the carriage. For ordinary pulls, a rope may be attached around the trail of the carriage. For short, hard pulls, it may be attached around the felloe, near to the ground, and passed over the tire of the wheel. A stalled carriage may often be started by turning the pole to one side as far as it will go and then straightening and moving the team in that direction.

c. Carriages should be driven squarely across sunken roads, ruts, narrow ditches, etc.; when necessary, the brake is applied

so that the traces are kept taut and the horses kept in draft continuously.

117. Gaits.—The average rates of speed of the authorized gaits are as follows: The walk, 4 miles per hour; the trot, 8 miles per hour; the gallop, 12 miles per hour.

CHAPTER 4

MOTOR TRACTION AND THE DRIVER

SECTION I

GENERAL

118. Objective of training.—The mobility of motorized units is dependent upon the efficient functioning of their tractors and motor vehicles, individually and collectively, and is a direct result of the selection, training, and supervision of motor personnel.

119. Subjects covered and sequence of instruction.—*a.* Though written specifically for tractor-drawn artillery, this chapter applies in general to all types of motorized artillery.

b. The general subjects to be covered in the instruction of the tractor driver are: Duties of the individual driver; maintenance of individual tractors; systems of organization maintenance, inspection, and repairs; organization driving and road discipline.

c. (1) In the training of the driver a systematic and progressive sequence of instruction must be adhered to. This training may be divided into preliminary instruction, maintenance instruction, and driving instruction.

(*a*) *Preliminary instruction* includes: Terms; nomenclature of the tractor, its tools and equipment; description of loads to be pulled; duties preliminary to starting the tractor; starting the engine; shifting gears; use of the master clutches and steering clutches; use and manipulation of spark and throttle controls; action of the brakes; use of towing cable or tow chain; cold-weather operation; vigilance while the tractor is in motion; fire precautions and fire fighting.

(*b*) *Maintenance instruction* includes: The care of the engine cooling system, carburetor and fuel system, ignition system, master clutch, steering clutches, transmission system, track rollers, steering mechanism; track assembly and adjustment; maintenance, cleaning and marking of bodies, tools, equipment, and accessories; system of organization maintenance, including gasoline and oil resupply, general routine cleaning and adjusting, lubrication and use of the lubrication chart; determining condition of oil in use; inspections; storage; mechanic's qualifications.

(*c*) *Driving instruction* should be given first without loads and then with loads. It includes: Shifting gears and manipulation of the clutch; handling the levers; use of the steering clutches; turning, backing, and coupling; use of brakes; starting; stopping; marching; pulling up steep grades and through mud and sand; driving down steep slopes; crossing fords and other obstacles; organization driving, including the duties of the individual driver and assistant driver, convoy rules, road discipline, traffic rules, and night driving; driver's examination and qualifications.

(2) (*a*) The preliminary instruction should form part of the daily program of recruit instruction. Driving and maintenance instruction should be given the recruit after he can operate the tractor without load. In the instruction of the tractor driver, work in repair, adjustment, care, and maintenance of tractors should be included as a part of the daily program. Familiarity with regulations for the tractor with which the organization is equipped should be required.

(*b*) Except when training under the guidance of a qualified instructor, an enlisted man should not be permitted to drive a tractor until he has passed a driver's examination and has been given a driver's permit. Prior to assigning enlisted men to duty as motor mechanics or assistant motor mechanics they will be required to pass a mechanic's examination and receive a mechanic's or assistant mechanic's permit.

120. Responsibility for and supervision of instruction.—The motor officer is charged with the instruction of drivers, assistant drivers, and mechanics in the care, maintenance, driving, and operating of motor vehicles. The motor sergeant is assistant to the motor officer.

121. Terms used.—A single tractor or other motor vehicle towing one or more carriages, trailers, or other vehicles is said

to be in *unit draft*. Two or more tractors or other vehicles attached one ahead of the other and pulling one or more carriages or trailers are said to be in *tandem draft*. Two or more tractors that are not attached to each other, but each of which is attached directly to one or more carriages or trailers in train, are said to be in *multiple draft*. Tractors, trailers, or other vehicles not directly connected by lunettes or drawbars to the vehicle in front, but connected by towing cables or chains, are said to be in *towing cable draft*. Two or more carriages or trailers coupled one behind the other for towing by one or more tractors are said to be *in train*. To *couple* means to attach the drawbar of a carriage or trailer directly to the pintle of a motor vehicle or trailer. To *limber* means to attach an artillery carriage to the pintle of another artillery carriage, whether or not the latter is coupled to a tractor. An *informal inspection* is an examination to check the work of mechanics and drivers and to determine the condition, without an itemized investigation, of the complete vehicle. A *formal inspection* is one in which the entire battery is prepared for inspection, the vehicles taking a prescribed formation and the personnel prescribed posts. The tools and equipment are laid out according to a prescribed form. A *technical inspection* is a minute inspection of a vehicle to determine its mechanical condition.

SECTION II

MAINTENANCE

122. Scope.—The term *maintenance* is used to include the cleaning, painting, servicing, adjustment, repair, and overhaul of the motor vehicle. *Servicing* includes the replenishment of fuel, oil, and water, and the lubrication of the vehicle.

123. General system of control.—Schedules based on detailed instructions contained in regulations for the vehicle concerned should be prepared and strictly followed. Scheduled cleaning, servicing, and the necessary attention immediately after use will be performed by the drivers and assistant drivers, assisted by such temporary details as may be required. This work will be done under the supervision of the chiefs of section and under the direction of the motor officer. The day's work of the drivers will not be considered complete until motor vehicles have been serviced, cleaned, put in order, and inspected. Trac-

tors in routine use should be washed weekly, and as much oftener as conditions require.

124. General regulations.—*a. Cleanliness.*—Dirt and grit are the sources of greatest wear. The process of thorough cleaning facilitates the prompt detection of loose bolts, rivets, and other parts needing attention. Before removing cover plates and entering the crank case, transmission case, or gear cases, the exterior must be carefully cleaned and all tools to be used inside such cases should be rinsed off with kerosene or gasoline.

b. Unusual sounds.—The driver must be on the alert at all times for unusual sounds. He should find out the cause, immediately eliminate it, if possible, or report the trouble.

c. Lubrication.—(1) *Oil.*—The proper oil level must be maintained. While driving, a constant watch must be kept on the oil pressure and also for any indications of overheating.

(2) *Grease.*—In injecting grease the driver must make sure that the grease has actually been introduced into the bearing.

(3) *Track lubrication.*—When operating over hard or improved roads, track pins should be slushed with oil. When operating over sandy or dusty roads, the track pins should not be oiled. Track rollers must be kept greased.

(4) *Use of lubricants.*—Lubricants must be appropriately used. Oil should not be used on parts requiring grease, nor grease on those requiring oil.

d. Early detection of defects.—At all times the driver should be on the lookout for needed adjustments. He should make such adjustments as are authorized, reporting others to the chief of section. Occasionally on the march the assistant driver should walk beside the tractor to observe the functioning of the various parts.

e. Use of time during halts.—The tractor driver should utilize this time for inspecting and lubricating his tractor. Immediately upon halting all accessible bearings and friction surfaces should be inspected by feeling if they are overheated. The halts may not be long enough for extensive care and adjustment, but by a systematic procedure a complete inspection, lubrication, and adjustment may be accomplished during successive halts.

f. Report of mechanical troubles and repairs required.—Upon the conclusion of each day's operation chiefs of section, assisted by drivers, inspect their tractors and check the supply of fuel and lubricant to insure that the tractors are prepared for resuming immediate service. Chief of platoon and the motor

officer, assisted by the motor sergeant, make a similar inspection. Repair tags are made out by the motor officer or motor sergeant on which are noted mechanical troubles developed and spare parts, repairs, and equipment required. The tags are attached to radiators and are removed by the motor officer or motor sergeant after the repairs or adjustments have been made or the equipment issued. If a motor vehicle can not be placed in serviceable condition with the parts and facilities available, a red card is attached to the repair tag or the vehicle otherwise identified; its status is then reported to the battery commander for his action.

g. Equipment.—Before leaving park, vehicles should be inspected to insure that they are properly equipped.

h. Gasoline.—Economy in the use of gasoline for cleaning purposes must be enforced.

125. Duties of the motor officer.—*a.* In addition to the duties prescribed in paragraph 120, the motor officer supervises the technical operation of motor vehicles, the making of adjustments and repairs not authorized to be made by drivers and not restricted to the Ordnance Department, and makes inspections as follows: Technical inspection; inspections at the conclusion of each day's operation, such other daily, weekly, and monthly inspections as are prescribed.

b. During a march the motor officer goes where his presence is necessary, using for this purpose the light repair truck or other vehicle assigned. He should see that the repair vehicle carries the prescribed parts, equipment, and lubricants required for making repairs and adjustments, and no other load.

c. The motor officer inspects governor seals to see that seals are kept intact after engine speeds have been correctly set; checks daily the Ordnance Motor Books and other records pertaining to motor vehicles to insure that they are properly made and kept up to date; reports periodically to the battery commander all requirements, including fuel, lubricants, and spare parts.

d. Under direction of the battery commander or the executive, the motor officer makes needed replacements.

e. The motor officer is assisted by the motor sergeant and the motor mechanics in the performance of his duties.

126. Duties of the tractor driver.—The tractor driver, under direction of his chief of section, is responsible for the following:

a. The care of his tractor, its tools, and equipment.

b. The operation of his tractor.

c. Making authorized adjustments and repairs.

d. The inspection of his tractor before starting and after the completion of the day's run and the reporting of the results to his chief of section.

e. The reporting of lack of fuel, oil, grease, and cleaning material to his chief of section.

f. Assisting in general maintenance work.

g. The strict observance of measures prescribed for preventing and extinguishing fires. (Par. 153.)

h. During halts, inspecting, lubricating, tightening, and adjusting where required.

i. Submitting data concerning his tractor for records, such as the Ordnance Motor Book, accident report, and inspection records.

127. Duties of the assistant tractor driver.—*a.* The assistant tractor driver, under direction of the tractor driver, assists in the maintenance and operation of the tractor to which he is assigned.

b. He drives the tractor at such times as may be ordered by his chief of section.

128. Maintenance routine.—Daily, weekly, and monthly maintenance operations should be performed systematically in accordance with a detailed schedule. The items listed in such schedule should refer to inspection, lubrication, and minor adjustment. Repairs, whether of a minor or major nature, will be performed as the necessity arises.

129. Cleaning and adjusting by detail.—*a.* During recruit instruction, or at such times as the battery commander may direct, each tractor will be thoroughly and systematically inspected, cleaned, adjusted, and lubricated by its driver and assistant driver, in accordance with a detailed schedule prepared for the particular type of vehicle. This schedule should be so arranged that each part of the tractor will be given the proper attention, that the sequence of work will be convenient and logical, and that the work will be divided approximately equally between the driver and assistant driver, each of whom is responsible for performing certain definite operations.

b. The formation and procedure are as follows:

(1) At the command ***FALL IN FOR CLEANING AND ADJUSTING,*** the men fall in in double rank, drivers in the front rank, assistant drivers in the rear rank.

(2) At the command ***PREPARE FOR CLEANING AND ADJUSTING,*** men fall out, proceed to the vehicle assigned them, lay out the tools necessary for the work, and place the grease and oil in an accessible place. When finished, they take post at attention 2 feet outside the tracks and on line with the radiator, driver on the left, assistant driver on the right.

(3) At the command ***Commence cleaning and adjusting,*** the driver and the assistant driver commence work on their respective sides, following the schedule. Whenever the officer in charge commands: ***ATTENTION,*** the men drop work and assume positions as indicated in (2) above.

130. Preparing vehicles for storage and for service.—Detailed instructions are contained in Technical Regulations and Ordnance Field Service Bulletins.

131. Repairs and overhaul.—*a.* Tractors will be kept in a proper state of repair. Repair work not authorized to be performed in the organization, or which can not be performed there properly, is a function of the Ordnance Department, to whose attention the necessity for the repairs will be reported through authorized channels.

b. Such repairs and replacements as are authorized for the battery in Technical Regulations are to be made only by qualified mechanics and under direction of the motor sergeant or a commissioned officer.

c. All drivers should be instructed respecting those minor adjustments and repairs which they should be authorized to make when operating tractors alone. However, drivers who are licensed motor mechanics may be permitted to undertake adjustments and repairs which are authorized to be made in the battery.

d. During field operations a tractor damaged to such an extent that it can not continue with the column is left in place so as not to block the road and, if repairs can not be made by the battery, the designated ordnance representative will be advised of the location of the tractor and the nature of the repairs to be made. Normally the driver and assistant driver remain with the tractor until it is taken over by the ordnance personnel.

e. During the indoor training period in garrison, each battery or similar unit, if its facilities and equipment permit, should disassemble and overhaul one or more tractors for the purpose of instruction and to familiarize the drivers and mechanics with

parts and adjustments. Only such disassembling as is authorized in Technical Regulations should be permitted.

SECTION III

INSPECTIONS AND RECORDS

132. General.—*a.* Inspections of tractors are made by officers and noncommissioned officers at sufficiently frequent intervals to maintain operating efficiency.

b. The technical knowledge of the officers in charge of the repair organizations should be utilized by inspectors. Inspection reports received from repair shops, indicating whether the necessity for repair has been due to improper operation, lack of cleanliness or lubrication, or failure to maintain proper adjustments, should be utilized by battery commanders for further instruction of drivers, mechanics, and other responsible personnel.

133. Informal inspections.—*a.* These may be made at any appropriate time.

b. Before and during storage, inspections should be made to see that all pertinent regulations are complied with.

134. Formal inspections.—*a.* Formal and technical inspections differ in purpose and procedure and should not be combined.

b. The battery being formed for inspection, at the command ***Prepare for inspection,*** drivers and assistant drivers raise hoods or armor doors to expose the engines, open all tool boxes and similar receptacles, raise the seat cushions, and lay out in a uniform manner on the ground all tools, accessories, and spare parts. (Fig. 20.) They then take their posts dismounted. (Par. 129.)

c. The inspector examines the Ordnance Motor Book of each tractor and checks off the number of the tractor on the list of organization vehicles. He causes the driver to start the engine and notes ease of starting, quietness in running, vibration, and governor speed control. The engine is then stopped. The inspector then makes a general inspection of the condition of the vehicle, observing particularly the cleanliness of mechanical parts at points of lubrication and such parts of the chassis as are likely to be neglected. He inspects tools and equipment for completeness, serviceability, and cleanliness. The commanding officer should have available for inspection the last technical inspection report for each tractor. The inspector notes particu-

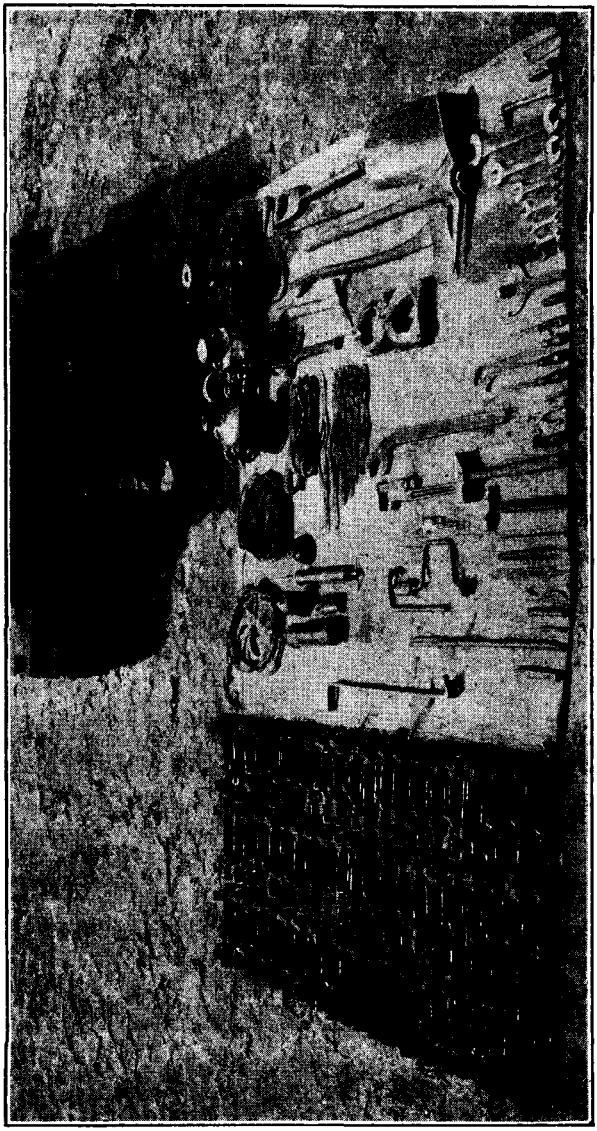


FIGURE 20.—Display of tractor equipment

larly what provision has been made for the repair or correction of any faults or defects noted therein.

135. Technical inspections.—The order followed in inspecting the various items should be the same as the numerical order of the parts listed on the Ordnance Inspection Report form or such other inspection report form as may be authorized. The officer making the inspection enters his observations on the form. A driving or road test may be necessary. Vehicles when first received in a battery should be given a technical inspection.

136. Frequency of inspections.—*a.* Informal inspections are required at each routine maintenance formation, before and after each march or operation of the tractor, and twice each month for vehicles in storage.

b. Formal inspections should be held at least once a week by battery commanders and at least once a month by higher commanders.

c. In garrison, technical inspections of each vehicle not in storage should be made at least once a month; similar inspections of vehicles in constant use should be made twice a month. Arrangements should be made to inspect one or more vehicles each day, and not an entire organization at one time. On the march technical inspections are made daily of one or more vehicles in order that each vehicle may be given a complete and systematic inspection as frequently as conditions permit. Vehicles should be given a technical inspection before and after storage.

137. Records.—*a.* An inspection report is filled out at each technical inspection.

b. Reports of technical inspections of all vehicles of the organization are included in a monthly consolidated inspection and lubrication report or similar record, one copy of which is forwarded to the next higher tactical commander.

c. For each tractor there should be provided an Ordnance Motor Book (O. O. Form No. 5956), which forms part of the driver's equipment and which, upon his dismissal for the day, is submitted by him to the officer or noncommissioned officer in charge of the formation, who, after checking the entries returns the book to the driver.

SECTION IV

TRACTOR OPERATION

138. General.—To maintain draft efficiency, constant practice in handling the tractor in individual and combined movements is necessary, even with thoroughly trained drivers. Drivers and assistant drivers should be assigned permanently to tractors.

139. Phases of instruction in driving.—*a.* Instruction follows a prepared schedule. If practicable, at the beginning the tractor is blocked up so that its tracks are free to turn without touching the ground. The driver starts and stops the engine, uses the controls, and shifts gears until proficiency is attained, after which he is given instruction in driving without load over level ground, followed by driving over uneven ground and easy obstacles. This instruction is then repeated with several tractors in column, with 5 to 10 yards distance.

b. The next phase in driving without load consists of driving over difficult obstacles. Part of this instruction should be given at night. During the above training the driver is given instruction in the care and adjustment of his tractor, special attention being given to lubrication.

c. After the driver has become proficient in handling the vehicle without load, he should be instructed in coupling. (Par. 142.) He is then required to repeat the instruction in driving with his tractor pulling one of the normal loads of the battery. Special instruction should be given in tandem and multiple draft, in the use of the towing cable, in crossing difficult obstacles, in placing the tractor and its load on trucks or railroad cars and in the camouflage and concealment of tractors.

140. Use of the controls, starting, stopping, and turning.—*a.* Detailed instructions are given in the handbook or Technical Regulations for each type of vehicle.

b. All turns should be made so that the inside track of the tractor describes the arc of a circle. Turns in place are made only where unavoidable. In turning the tractor with load, care must be taken to avoid sudden, sharp movements which may injure or overturn the load or unduly strain the tractor mechanism. The turning radius of a tractor with load varies, depending on the type of load and the kind of terrain.

141. Backing.—When backing the tractor with load, the assistant driver dismounts and directs the movement. The load

should be backed straight to the rear to avoid cramping the wheels. Backing for long distances and turns while backing are difficult to execute and should be avoided except for instructional purposes.

142. Coupling.—To couple, the tractor is driven close to the carriage, turned on the arc of a circle, radius approximately 3 yards, and is halted when headed in the direction in which the drawbar points. The tractor is then backed until the lunette of the drawbar can be lowered on the pintle of the tractor.

143. Driving up steep grades.—*a.* To prevent crowding, distances are increased upon approaching a grade. At times it may be advisable for each tractor to complete the ascent before the following tractor is started. Before attempting to ascend a grade it is important to select a gear which will insure the passage of the entire slope without change. Steering should be avoided if possible when the full tractive effort is needed, as it will almost always cause the track, to which the power is flowing, to slip on the ground, thereby losing its traction. Slipping may frequently be remedied by shutting off the power and then applying it evenly and only in sufficient amount to move the tractor slowly. Traction may be increased by adding weight to the tractor.

b. If the engine stalls, the hand brake should be applied at once and the gears shifted into neutral. If the tractor is to be left on a grade, the tracks must be blocked.

c. In passing over very difficult ground, tandem draft may be necessary. A spare tractor, if available, or one preferably from the rear of the column should be moved forward to assist each of the loaded tractors in turn, after which it moves its own load, assisted by the tractor immediately ahead.

d. Where conditions permit, a movement over difficult terrain may be expedited by having all the more lightly loaded tractors move to the head of the column and precede the others over the difficult terrain.

144. Descending steep grades.—In descending steep grades the gears should be set in second or low and the engine used as a brake. If the grade is steep enough for the tractors to descend without power, or if the load is heavy enough to push the tractor, steering must be reversed in descending the grade. For example, if the tractor is being pushed and it is desired to make a turn to the left, the driver releases the right track by operating the steering lever as though, when pulling, he intended to

make a turn to the right. If the turn is sharp it may also be necessary to brake the track on the inside of the turn.

145. Driving through mud.—*a.* Care should be exercised to prevent slipping of the tracks, since when they have once slipped they may continue to do so, or may cut so deeply into the mud that all traction will be lost.

b. On slippery, hard-surfaced roads measures should be taken with the loads to prevent their side-slipping, jack-knifing, and eventual overturning. Deterrents comprise the prompt application of sand, gravel, gunny sacks, etc., under the wheels of the load.

c. In crossing muddy stretches a tractor, once across, can pull the others through by towing-cable draft. The leading tractor, if stalled, can be pulled through by means of a tackle attached to a tree or a deadman sunk in the ground beyond the soft place, and the tractor following in column can be used to pull it through. Similar methods may be used in crossing streams. In crossing soft, marshy ground it may be advisable for tractors not to follow in trace.

146. Passage of obstacles.—*a.* Where the construction of the tractor permits, it should always be driven squarely across ditches, embankments, or similar obstacles. In dropping into ditches or over embankments, in order that the front of the tractor can be lowered without shock and possible attendant damage, the tractor must be balanced by use of the master clutch lever. This is accomplished as follows: With the throttle set, the master clutch and the steering clutch brakes are alternately engaged and released. This slowly forces the tractor up, while holding it with the brakes if the engine should commence to stall. When the engine picks up, the clutch is again engaged, easing the tractor across the obstacle.

b. All noncommissioned officers and drivers must be taught the characteristics of the tractors, artillery carriages, and trailers of their organization which may affect the method of passing obstacles. They must be familiar with the road clearance of the tractor and of the load drawn.

147. Night driving.—*a.* In the majority of cases night driving must be without the aid of artificial light.

b. Instruction should begin on familiar ground, and drivers should be aided by lights. It should then progress to operations with shrouded tail lights or over ground marked by connecting files or guides flashing lights on the ground at

intervals; and, finally, to driving over entirely strange ground without any artificial light whatever, with the aid only of white markers. Under such circumstances it may often be necessary for drivers to dismount and proceed for short distances on foot over the route the tractors are to follow. Hidden stumps and large bowlders must be located and avoided.

c. It is important that a gear be selected for such operations which will surely deliver the power needed in difficulties.

d. When lights are used the rays should be directed on the ground or upon obstacles in the path. Drivers should not be blinded by having lights flashed in their faces.

148. Speeds.—*a.* The most efficient operating speed for each gear, as given in the handbook or Technical Regulations for the particular type of tractor, should normally be used. In no case should vehicles be driven faster than the maximum authorized speed, which should be posted conspicuously on each tractor.

b. As part of the monthly maintenance routine, the engine speed will be tested by the motor sergeant. If the maximum authorized speed is not obtained or if overspeeding is indicated, action will be taken to have the proper adjustments made by ordnance personnel.

c. Next to lack of lubrication, overspeeding causes more wear and depreciation than any other one thing.

149. Common causes of engine trouble.—Tractor drivers and mechanics are taught the common causes of engine trouble, as given in the handbook or Technical Regulations for the particular tractor, in order to enable them to locate troubles by a systematic process of inspection and to make such adjustments or repairs as are authorized.

150. Operation in cold weather.—*a.* Antifreezing solutions may be used if available. If not available, cooling systems must be protected during freezing weather by draining. The use of antifreezing solutions containing kerosene, or salts which corrode metal, is forbidden. When alcohol solutions are used, daily hydrometer readings should be taken. The fact that antifreezing solutions have been used does not operate to relieve personnel from responsibility for damage to engines by freezing.

b. When radiators are drained it should be assured that no water remains in the circulating system. The vehicle should, if necessary, be inclined toward the drain cocks; the radiator and pumps should be drained at their lowest points, after which

the engine is run slowly for not more than one minute and stopped by shutting off the gasoline supply at the tank; after the engine has stopped, the carburetor should be drained, as water may have collected at the bottom. The filler cap should not be replaced tightly.

c. When the radiator is not drained freezing should be prevented by covering the radiator and hood, by running the engine at intervals, or by placing heaters under the hood, special precautions being taken to avoid fire. To prevent freezing when the vehicle is running, aprons should be provided to cover the radiator.

d. If the radiator is frozen, it may be thawed out by allowing the engine to run slowly for a few minutes at a time or by using hot water. If the cooling system has been drained and hot water is used for refilling, cranking will be easier. If the engine fails to start, care should be taken to drain the water before it freezes. If hot water is not available, the engine may be started and run for not exceeding three minutes before filling, and the water then poured in gradually; this is strictly an emergency measure which should only be resorted to under the direction and supervision of the motor officer.

e. Warming the intake manifold, flooding the carburetor, and priming the cylinders are helpful in starting a cold engine. The exhaust from an operating engine may be conducted through a piece of hose and used to thaw frozen parts.

f. Under all conditions of cold weather operation, the engine should be run without load until oil is circulating throughout the system.

g. The oil in the crank case must be changed more frequently in cold weather on account of increased dilution.

h. If the tractor has been allowed to stand in the mud and the tracks are frozen in, they should be loosened, with a jack if necessary, before attempting to start the tractor, otherwise serious damage may result.

151. General rules for drivers.—*a.* A driver must never abandon his tractor, except by order of his commanding officer.

b. Tractors should not be driven by anyone but regular drivers or assistant drivers, except in case of emergency.

c. Drivers should not permit unauthorized persons to ride on vehicles.

d. The use of the muffler cut-out is forbidden at all times.

e. Engines must not be run for any length of time in closed or poorly ventilated buildings, on account of the danger of exhaust-gas poisoning.

f. Drivers must not smoke while driving.

g. Military police on duty must be strictly obeyed.

h. Road signs and signals should be given strict attention.

i. A driver keeps to the right of the road, whether moving or at a halt.

j. The tampering with governor seals is forbidden.

152. Accidents.—In the event of an accident in which his tractor is in any way involved, the driver, as early as practicable, makes a report thereof to his commanding officer. A record of the damage is made in the Ordnance Motor Book by the organization commander or motor officer. This record is in addition to the report required by Army Regulations.

153. Procedure in case of fire.—Fires are frequently caused by defective inlet valves, leaking fuel lines, and naked flames. In case of fire use the Pyrene or other chemical extinguisher with which the vehicle is equipped. A wet blanket, dirt, or mud may be used. Do not use water, as it will spread the fire. After a chemical fire extinguisher has been used on a fire within a closed place the place should be thoroughly ventilated before men are allowed to enter or remain in it.

CHAPTER 5

MANEUVERS LIMBERED

SECTION I

SCOPE

154. Scope.—The provisions of this chapter apply, in general, to all calibers of Field Artillery, though intended to apply particularly to horse-drawn artillery.

SECTION II

ORGANIZATION AND FORMATION OF BATTERIES

155. General.—The leading caisson of a section in the normal order in park is called the first caisson, the other the second caisson. Movements prescribed for the piece and caisson of a gun section apply, with obvious modifications, to the first and second caissons, respectively, of a caisson section.

156. The battery detail.—The battery detail corresponds to a platoon of two sections.

157. Organization of the battery.—Batteries of Field Artillery are organized as shown in Figures 1, 2, and 3, and Tables I, II, and III.

158. Transport for cannoneers.—*a.* In horse-drawn batteries, cannoneers march on foot, or are mounted on the carriages, at the discretion of the battery commander. They are not ordered to mount or dismount when the battery is marching at a trot.

b. In horse batteries the cannoneers are individually mounted; before unlimbering all dismount except horse holders.

c. In tractor-drawn artillery the cannoneers are mounted on the artillery carriages or ride in motor vehicles.

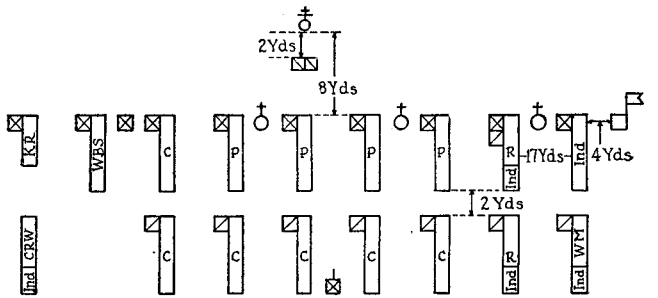
159. Formations of the battery.—*a. Order in line.*—The battery is formed as indicated in Figure 21. (The sections may be formed in the reverse order.) Carriages are limbered and in each section are in section column, pieces being either all in front or all in rear of their caissons.

b. Order in double section line.—Similar to the order in line, except that each section is formed in double section.

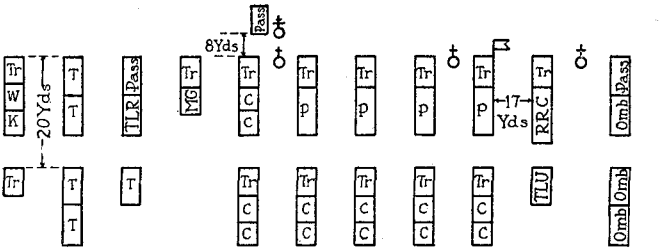
c. Order in section column.—The sections follow each other in the order, or reverse order, of their positions in the order in line. Carriages are limbered and sections are in section column; sections are similarly formed, pieces being either in front or in rear of their caissons.

d. Order in double section column.—Similar to the order in section column, excepting that sections are in double section, similarly formed.

e. Order in flank column.—The sections follow each other in their regular order, or reverse order; carriages are limbered and in each section are in flank column, the caissons being all on the same flank of their pieces.



①75-mm gun, horse-drawn(7oSept. 1930)



②155-mm howitzer, tractor-drawn(7oDec.1930)

Legend:(for Figs. 21,22,23,24,25,)

☩ - B.C.	Ind.	- Individually mounted men	Pass - Passenger car
☩ - Lieut	P	- Piece	M.C. - Motorcycle with sidecar
⊠ - 1st Sgt.	C.	- Caisson	Omb - Omnibus
⊠ - Sgt.	R.	- Battery reel	T. - Truck, medium
⊠ - Corp.	R.C.	- Reel and cart	TLR. - Light repair truck
⊠ - Bugler	W.B.S.	- Battery and store wagon	Tr. - Tractor
⊠ - Guidon	W.M.	- Mountain wagon	K. - Kitchen trailer
	W.E.	- Escort wagon	W. - Water trailer
	K.R.	- Rolling kitchen	M.G. - Machine gun trailer
	C.R.W.	- Ration and water cart	TLU. - Truck, light utility.

FIGURE 21.—Order in line (battery)

f. Order in battery.—The pieces and caissons of the gun sections, placed for action, are in line in the order, or the reverse order, of their permanent numbers from right to left; the caissons of the fifth section, unlimbered, are placed one on each flank of this line, or otherwise disposed by direction of the battery commander; the limbers are either in rear of their carriages or at such other place as the battery commander may direct.

160. Intervals and distances.—*a. Intervals.*—The interval between adjacent wheels of hitched or coupled carriages in line is 17 yards; in double section line the interval between adjacent wheels of adjoining sections is 13 yards. Between adjacent wheels of automobiles, trucks, or motor cycles formed in line, the interval is 4 yards unless otherwise specified.

b. Distances.—(1) The distance between hitched carriages in column, from the heads of the lead horses of the carriage in rear to the rear of the carriage in front, is 2 yards.

(2) Between coupled carriages, tractor drawn, the distance is such that when moved by the flank the interval between adjacent wheels will be 17 yards; that is, 75-mm. (tractor drawn, two caissons and piece), 4 yards; 155-mm. howitzer, 7 yards; 155-mm. gun, 5 yards.

(3) In column or in line, the distance between a carriage and a mounted gun squad is 2 yards. In flank column the distance between caissons is such as to permit each caisson to march abreast of its piece. In line the distance between caissons of the caisson section is such that the caissons are abreast of the pieces and caissons of the gun sections. In battery, when the limbers or tractors are posted in rear of their carriages the distance from the heads of the lead horses, or front of tractors, to the rear of the caissons in the line of pieces is 25 yards.

(4) In column the distance between automobiles, trucks, or motor cycles is 5 yards, unless otherwise specified.

161. Posts of individuals.—*a.* The posts of individuals are as shown in the tables below. The posts indicated in the tables for the order in battery are merely for drill purposes.

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(1) *Horse-drawn batteries.*

Individuals	Order in line or double section line	Order in section column or double section column	Order in flank column	Order in battery
Captain	8 yards in front of the battery opposite the center.	Opposite the center of the column and 15 yards from the left flank.	Opposite the center of the column and 15 yards from its flank; on the left when the right section leads, and on the right in the reverse order.	Halfway between the 2 center sections, 10 yards in rear of the line of the trail spades.
Platoon commander	Halfway between his sections, and in line with the lead drivers of his leading carriages.	Opposite the center of his platoon, 4 yards from the left flank.	Halfway between the pieces and caissons, and in line with the lead drivers of his leading carriages.	Halfway between the guns of his platoon, and 5 yards in rear of the line of the trail spades.
First sergeant (when not acting as chief of platoon).	Halfway between the center sections, opposite the rear of the rear carriages.	Opposite the center of the battery, 4 yards from the right flank.	Opposite the center of the column and 4 yards from its flank; on the right when the right section leads, and on the left in the reverse order.	Halfway between the 2 center sections, 20 yards in rear of the line of the trail spades.
Chief of section	Boot to boot with the lead driver of his leading carriage, or, if in double section, of his piece.	Same as in line.	Boot to boot with the lead driver of his piece.	2 yards in rear of the lunette of his caisson and opposite its center.
Caisson corporal	Boot to boot with the lead driver of his caisson; but, if the chief of section is posted with the caisson, then boot to boot with the swing driver.			
Guidon	Abreast of the guide of the battery, and 2 yards to his left. Before leaving park, 4 yards from the right flank of the battery aligned on the lead drivers			
Buglers	Boot to boot with each other, 2 yards in rear of the captain.			

(2) *Tractor-drawn batteries.*

Individuals	Order in line or double section line	Order in section column or double section column	Order in flank column	Order in battery
Captain	8 yards in front of the battery opposite the center.	Opposite the center of the column and 15 yards from the left flank, if the original formation is in column; otherwise on that flank where each maneuver leaves him.	Opposite the center of the column and 15 yards from its flank, on the side of the column with the pieces, if the original formation is in flank column; otherwise on that flank where each maneuver leaves him.	Halfway between the two center sections, 10 yards in rear of the line of the trail spades.
Platoon commander	Halfway between his sections and in line with the front of the tractors of his leading carriages.	Opposite the center of his platoon, 4 yards from the flank on the same side as the captain.	Halfway between the pieces and caissons, and in line with the front of the tractors of his leading carriages.	Halfway between the guns of his platoon, and 5 yards in rear of the line of trail spades.
First sergeant (when not acting as chief of platoon).	Halfway between the center sections, opposite the rear of the rear carriages.	Opposite the center of the battery, 4 yards from the flank opposite the captain.	Opposite the center of the column, 4 yards from the flank opposite the captain.	Halfway between the 2 center sections, 20 yards in rear of the line of the trail spades.
Chief of section	On piece tractor	Same as in line	Same as in line	2 yards in rear of the lunette of his caisson. If no caisson is present, 2 yards to the left of the end of the trail of his piece.
Caisson corporal	On caisson tractor	do	do	Same as in line.
Guidon	On the piece tractor of the first section.	do	do	Do.
Buglers	In vehicle, as prescribed for type of battery.	do	do	Do.

b. Cannoneers take posts as prescribed in Training Regulations for "service of the piece." In horse batteries, with the carriages limbered, gun squads, when not specifically directed otherwise, are in rear of their caissons, dressing to the side of the guide; in section column they dress to the right; in flank column, double section column, and double section line they form on the outer flank of the caisson, the front rank aligned on the axle of the limber. Led horses of the cannoneers of horse batteries are posted 2 yards in rear of the caisson limber.

c. When the battery is being maneuvered in drill-ground exercises the battery detail and maintenance section are usually detached for separate instruction.

d. Officers and noncommissioned officers leave the posts herein designated when necessary for better performance of their duties.

162. Disposition in park.—Carriages are arranged in the order in line, pieces in front, in normal order of sections from right to left, at intervals as directed by the battery commander. In tractor-drawn batteries tractors are uncoupled and moved 5 yards to the front.

163. To form the battery in park.—*a.* (1) The battery being in line dismounted, the first sergeant commands: ***DRIVERS TO THE FRONT.*** The chiefs of section, drivers' squads and battery detail step six paces to the front, and are then closed in and marched by the senior chief of section to the horses or motor vehicles. Arriving at the position of the horses or motor vehicles, the chief of section in charge halts the detachment and commands: ***HARNESS,*** or, ***START ENGINES.*** In horse-drawn batteries, the drivers fall out and harness, and individually mounted men saddle; the chiefs' of section horses are saddled by men detailed for that purpose. In tractor-drawn batteries, drivers fall out, make the prescribed inspections and start the engines.

(2) The drivers having been marched off, the gun squads are closed in by the first sergeant and then marched to the gun park by the senior gunner. Arriving at the park, the squads are posted with their carriages if the latter are not in the gun shed, otherwise the detachment is halted and the detachment commander commands: ***FORM PARK.*** At this command the cannoneers fall out and run the carriages out of the shed by hand.

(3) The park being in order, the senior gunner posts the cannoneers at the carriages limbered and commands: ***PUT YOUR***

CARRIAGES IN ORDER. At this command, carriages are prepared for hitching, extra cannoneers being detailed to perform the necessary police duty.

(4) In horse-drawn batteries, as soon as the horses are harnessed, the first sergeant commands: ***LEAD OUT.*** At this command, sections lead out in turn and form in column. The first sergeant then mounts the drivers and conducts the column to the park, posting the teams with their carriages and causing them to be hitched.

(5) In tractor-drawn batteries, the first sergeant, having designated the order of movement, commands: 1. ***To your carriages,*** 2. ***DRIVE OUT.*** At the second command, motor vehicles proceed to the park, take posts, and are coupled.

(6) In horse batteries, when the carriages have been prepared for hitching, the senior gunner directs the gunners to march their squads to the horses and saddle.

b. In the field, the duties enumerated in *a* above are performed at the command of the first sergeant: 1. ***Drivers,*** 2. ***HARNESS AND HITCH,*** or, ***START ENGINES AND COUPLE.***

c. The lieutenants reach the park or the stables at such time as is necessary for them to superintend the proper details of their departments. They take their posts as chiefs of platoon as soon as the teams or tractors are posted with the carriages and in time to superintend the hitching or coupling. Each chief of section inspects his section when hitched, or coupled, and reports the result to his chief of platoon. Each chief of platoon, having received the reports of his chiefs of section, makes a general inspection of his platoon and commands: ***REST.*** Platoons are called to attention upon the approach of the battery commander, and as soon as he has taken his post, platoon commanders report in succession from right to left, "Detail in order, sir," or "First (such) platoon in order, sir," or report deficiencies noted as a result of the inspections. Following these reports, the first sergeant makes his report. (Par. 62 *d.*)

164. To dismiss the battery.—*a.* As soon as the battery is parked, chiefs of section inspect their sections and report injuries or losses to their respective chiefs of platoon; the latter make appropriate reports to the battery commander as in the formation of the battery. The battery commander then gives such instructions as may be necessary and directs the first sergeant, ***Dismiss the battery.*** Offices fall out.

b. The first sergeant commands: ***UNCOUPLE;*** or 1. ***Cannoneers,*** 2. ***UNHITCH;*** or 1. ***Drivers,*** 2. ***DISMOUNT,*** 3. ***UNHITCH,*** 4. ***UNHOOK TRACES.*** Teams, or motor vehicles, are then conducted by the first sergeant to the stables or motor sheds. He then commands: ***FALL OUT,*** whereupon each chief of section takes command of his section. The assistant executive, assisted by the first sergeant and stable or motor sergeant, superintends the work of the drivers. The executive, assisted by the chief mechanic, superintends the work of the cannoneers in caring for the artillery carriages.

c. In the field, the first sergeant when directed to dismiss the battery commands: ***UNCOUPLE;*** or 1. ***Drivers,*** 2. ***DISMOUNT,*** 3. ***UNHITCH AND UNHARNESS.*** Chiefs of section then take charge of their sections.

d. In horse batteries, while the drivers are unhitching, gun squads are marched by the senior gunner to the stables or picket line. At the command ***Fall out,*** they unsaddle and care for their equipment. Sufficient cannoneers are left to take care of the horses; the remainder return to the park to care for the matériel.

e. In garrison, the battery should be formed dismounted, marched by the first sergeant to barracks, and there dismissed.

f. To leave the park, squads having been formed in front or rear of their pieces, the command is: 1. ***Squads right (left),*** 2. ***MARCH,*** 3. ***Close,*** 4. ***MARCH,*** 5. ***Forward,*** 6. ***MARCH.***

SECTION III

COMMANDS AND SIGNALS

165. General.—*a.* Commands may be given orally or by the arm, bugle, or whistle. Oral commands may be supplemented by signals.

b. Chiefs of platoon repeat the commands of the battery commander or give appropriate commands to their platoons in time to insure the proper execution of the maneuver. The chiefs of platoon ordinarily give their commands orally, supplemented, if necessary, by the appropriate arm signal, and see that the commands of the battery commander are understood and correctly executed by their platoons. If a chief of platoon does not hear a command, he governs himself by what he sees executed by the adjoining platoon.

c. Chiefs of section repeat the commands of their chiefs of platoon, or give appropriate commands to their sections in time to insure the proper execution of the maneuver. Chiefs of section ordinarily give their commands by arm signals, supplemented, if necessary, by oral commands, and see that the command is understood and that it is correctly executed.

d. Commands are of two kinds; first, preparatory commands, which indicate the movement to be executed, such as ***Forward;*** and second, commands of execution, such as ***MARCH.*** A well-defined pause should be made between the two kinds of commands when used together; in mounted movements both should be more or less prolonged. Oral commands should be given facing the unit; arm signals should be given when facing in the same direction as the unit.

166. Whistle signals.—*a. **Attention.***—One long blast.

*b. **Battery commander's party report.***—One long, followed by one short blast, the whole signal repeated once.

*c. **Cease firing.***—One long blast.

*d. **Chiefs of section report.***—Three long blasts.

*e. **Officers report.***—Two long blasts.

*f. **Start engines.***—Two long, followed by two short blasts.

*g. **Stop engines.***—Two short, followed by one long blast.

167. Arm signals.—These signals may be made with either arm or the saber, but are generally made with the right arm. The signal for the command of execution, ***MARCH,*** consists in extending the arm vertically and then lowering it sharply to the side. In movements involving a change in the direction of march, it is desirable for the battery commander to move in the new direction while making the preparatory signal. Arm signals are—

*a. **Action front (right) (left) (rear).***—Extend the arm vertically; lower it quickly to the front (right) (left) (rear) with palm vertical and return it through the same arc to the vertical. Repeat several times.

*b. **Attention.***—Extend the arm vertically and move it laterally several times through a small arc.

*c. **Back.***—Carry the hand to the shoulder and move the open hand, palm extended, several times in the desired direction. This signal is given facing the desired direction of movement.

*d. **By the right (left) flank.***—Extend the arm vertically and lower it to the right (left) until horizontal.

e. Caissons front.—Extend the arm horizontally to the front and then move it several times through a small horizontal arc, palm down.

f. Cease firing.—Raise both arms vertically, and hold them in that position until the signal is understood.

g. Change direction to the right (left).—Extend the arm vertically; lower it to the left (right) until horizontal and describe a horizontal semicircle to the front and right (left).

h. Close intervals.—Point to the section on which intervals are to be closed and then signal right (left), (right and left) oblique, according as the intervals are to be closed on the right, left, or an interior section.

i. Countermarch.—Extend the arm vertically and describe quickly several small horizontal circles.

j. Crank engines.—Make a whirling motion with the right hand in front of the body, simulating cranking.

k. Decrease the gait (preparatory).—Raise the right elbow to a position above and to the right of the right shoulder. Extend the forearm upward and to the left, right hand above the head. To indicate an increased or decreased gait for a maneuver, the appropriate signal is made following the preparatory signal for the maneuver.

l. Double section right (left) oblique.—Extend the arm horizontally to the right (left) and then move it several times through a small vertical arc, palm vertical.

m. Extend intervals.—Point to the section on which intervals are to be extended and then give the appropriate signal for obliquing.

n. Flank column, right (left) oblique.—Extend the arm horizontally to the right (left) and then move it several times through a small horizontal arc, palm down.

o. Forward.—Extend the arm vertically and lower it to the front until horizontal.

p. Guide.—After the signal of execution point at the guiding element.

q. Halt.—(Preparatory) raise the hand vertically to the full extent of the arm. (Execution) drop the arm to the side.

r. Increase the gait (preparatory).—Carry the hand to the shoulder, fist closed. Rapidly thrust the fist upward vertically to the full extent of the arm and back to the shoulder several times. (See *k* above.)

s. Limber, couple or pack.—Extend both arms laterally, palms down.

t. On right (left) into line.—Signal a change of direction to the right (left), followed by the signal for left (right) front into line.

u. Pieces front.—Extend the arm horizontally to the front, palm vertical, then move it several times through a small vertical arc.

v. Prepare to dismount (preparatory).—Extend the arm diagonally upward to the right, palm downward, fingers extended and joined, and wave the arm downward several times.

w. Prepare to mount (preparatory).—Extend the hand horizontally to the right, palm up, fingers extended and joined, and wave the arm upward several times.

x. Right (left) about.—Extend the arm horizontally to the left (right) and describe slowly a large horizontal circle and one-half to the front and right (left).

y. Right (left) by section.—Point at the right (left) section and signal forward.

z. Right sections forward.—Extend the arm vertically and then thrust several times to the front, fist closed.

aa. Right (left) front into line.—Extend the arm vertically and describe several large vertical circles on the right (left) side.

ab. Right (left) into line.—Signal a change of direction to the right (left) followed by describing small circles with the arm extended.

ac. Right (left) oblique.—Extend the arm obliquely upward to the right (left) and front, and then lower the arm, describing a large vertical circle on the right (left) side.

ad. Route order.—Extend the arm vertically and move the arm slowly back and forth from right to left through a wide arc.

ae. Stop engines.—Cross wrists in front of chin.

SECTION IV

MANEUVERS

168. General.—*a.* Movements that may be executed toward either flank are explained as toward but one flank.

b. Any movement may be executed either from the halt or when marching, unless otherwise prescribed.

c. All mounted movements not specially excepted may be executed at the trot or gallop. To execute a movement at an increased or decreased gait, the command ***Trot (Gallop) (Walk),*** precedes the command ***March.*** Gaits are increased or decreased one degree at a time.

d. Movements explained for smaller units are applicable, in general, to larger units with appropriate changes in commands.

e. When, due to differences in length of elements, proper intervals and distances do not obtain during maneuvers, the prescribed intervals or distances will be secured gradually by appropriate modifications of pace.

f. If, in forming elements abreast of each other, the commands 1. ***Battery (platoon, section),*** 2. ***HALT,*** be given during the movement, only those elements halt which have reached their new positions; the others continue the march and halt on reaching their positions.

g. To correct errors while marching, or to suspend the movement, the instructor may command: 1. ***In place,*** 2. ***HALT,*** when all halt and stand fast. To resume he commands: 1. ***Resume,*** 2. ***MARCH.***

h. The instructor may command: ***AS YOU WERE,*** to revoke a preparatory command.

169. Guides.—*a.* Each chief of section supervises the gait and direction of march of his section. The rules for guides are similar to those set forth in paragraph 98. Marching in flank column the guide of the battery is the guide of the leading carriage on the flank designated by the battery commander.

b. The battery commander may place himself in front of a carriage and command: ***GUIDE ON ME.*** The carriage in rear of the battery commander follows his movements and becomes the guiding carriage.

170. The guidon.—*a.* In horse-drawn batteries, the guidon, on leaving park, at once posts himself with the guide of the battery and, in all subsequent movements, changes position, when necessary, so as to be with the guide of the battery, except during an oblique march.

b. In a tractor-drawn battery, the guidon remains on the piece tractor of the first section.

171. Directing carriages.—In changes of formation, carriages which establish the direction and rate of march of the new formation are termed directing carriages.

172. Essential changes in gaits.—In the maneuvers hereinafter described, two general rules apply as to essential changes in gait. These rules, which will be referred to hereafter as Rule 1 and Rule 2, are as follows:

a. Rule 1.—In a change of formation requiring certain carriages to gain ground so as to reach specified positions abreast of the directing carriages the battery commander may or may not announce an increased gait. If an increased gait is announced, the directing carriages maintain their gait; other carriages move at the gait announced until they have reached their new position, when they take the gait of the directing carriages. If an increased gait is not announced, the directing carriages reduce their gait one degree; the others maintain their gait until they reach their new position, when they take the gait of the directing carriages. If the movement is executed from a halt or while marching at a walk (low speed), and an increased gait is not ordered, the directing carriages advance three carriage lengths toward the front of the new formation and halt.

b. Rule 2.—When a change of formation requires the directing carriages to gain ground in order to precede the other carriages, the battery commander may or may not announce an increased gait. If he announces an increased gait, the directing carriages take the increased gait at once; the others take it up so as to follow the movement in their proper order. If he does not announce an increased gait, the directing carriages maintain their gait; the others reduce the gait one degree, and take the gait of the directing carriages in time to follow the movement in their proper order. If the movement is executed from a halt, or while marching at a walk (low speed), and an increased gait is not ordered, the directing carriages move at a walk (low speed); the others remain halted, or halt, and take up the gait of the directing carriages as before.

173. Alignments.—The battery is aligned in a manner and by commands similar to those given in paragraph 97. The battery commander supervises the alignment from a position on the flank toward which the alignment is made and in line with the wheel (tractor) driver of the base carriage, facing down the line. The first sergeant similarly superintends the alignment of the wheel drivers of the rear-rank carriages. In horse batteries gun squads align themselves to the flank ordered, under the supervision of their gunners.

174. To march to the front and to halt.—The commands are respectively: 1. ***Forward,*** 2. ***MARCH;*** and 1. ***Battery,*** 2. ***HALT.***

175. To march by the flank.—The command is: 1. ***By the right (left) flank,*** 2. ***MARCH.*** Except as noted below, all carriages simultaneously turn to the right. If the battery is in line with closed intervals, the movement is executed by sections successively instead of simultaneously. If executed while marching at closed intervals, all sections except the one on the designated flank halt at the second command, and then follow by a successive movement. This movement is not executed from section column, except when it is intended to march by the flank but a short distance and then resume section column.

176. To march to the rear.—*a. By an about.*—The command is: 1. ***Right (left) about,*** 2. ***MARCH.*** All the carriages simultaneously execute the about. In horse batteries the leading carriages, on making the about, by reason of the presence of the gun squads, will modify their gait slightly to obtain the prescribed distances.

b. By a countermarch.—Being at the order in line or in section column the command is: 1. ***Countermarch,*** 2. ***MARCH.*** The leading carriage of each section executes left about, followed in trace by its rear carriage.

177. Being in line at closed interval, to march to the rear.—The command is: 1. ***Right sections forward,*** 2. ***MARCH,*** 3. ***Right (left) about,*** or ***Countermarch,*** 4. ***MARCH,*** 5. ***GUIDE RIGHT (LEFT).*** At the second command the right section of each platoon moves forward so as to clear the left section. If an increased gait is ordered, the right sections take the gait indicated; otherwise the left sections reduce the gait 1°, or, if halted, remain halted. As soon as the right sections are clear of the left sections, the fourth command is given, and all sections take the gait of the right section. On the completion of the about or countermarch, the fifth command is given and the rear sections increase the gait to reach their positions in line.

178. To march obliquely.—The command is: 1. ***Right (left) oblique,*** 2. ***MARCH.*** At the second command, carriages oblique simultaneously, moving on parallel lines, aligned from front to rear and right to left. The movement should be such that on executing a second oblique in either direction carriages would have the proper distances, intervals, and alignments.

179. To change direction when in column.—The command is: 1. ***Column right (left),*** 2. ***MARCH.*** If in section column, the

leading carriage makes a 90° turn, followed in trace by the other carriages. If in double section or flank column, the outside carriages increase the gait 1° during the turn. Column half right (left) may be executed.

180. To change direction when in line.—The command is: 1. ***Battery right (left) wheel,*** 2. ***MARCH.*** The pivot section executes column right; the other sections move to their positions in line by twice executing column half right. Rule 1 governs the gaits. Battery right (left) half wheel may be executed.

181. Passage of carriages.—Being in line or section column, the command is: 1. ***Pieces (caissons) front,*** 2. ***MARCH.*** The carriages designated in the command are the rear carriages; each inclines to the left, passes the leading carriage, and takes position in front of it. Rule 2 governs the gaits.

182. To close or to extend intervals in line.—The command is: 1. ***On (such) section,*** 2. ***To (so many yards),*** 3. ***Close (extend) intervals,*** 4. ***MARCH.*** The indicated section moves straight to the front; the other sections incline toward or away from the indicated section and move to the front when at the proper interval. (Rule 1.)

183. To form section (double section) column to the front from line (double section line).—The command is: 1. ***Right (left) by section,*** 2. ***MARCH.*** The right section moves straight to the front; the others successively (simultaneously) change direction to the right and then successively to the left so as to follow in column. (Rule 2.)

184. To form line (double section line) to the front from section (double section) column.—The command is: 1. ***Right (left) front into line,*** 2. ***MARCH.*** The leading section moves straight to the front; other sections move into their positions by two obliques. To form at closed intervals the command is: 1. ***At (so many) yards,*** 2. ***Right (left) front into line,*** 3. ***MARCH.*** (Rule 1.)

185. To form line to the right (left) from section column.—The command is: 1. ***Right (left) into line,*** 2. ***MARCH.*** The leading section executes column right, and moves forward; the other sections move forward and successively execute column right, moving into their positions in line to the right of the leading section. The second section in line inclines to the right to clear the leading section when the latter is moving at a slower gait. Line may be formed at closed intervals, the

first command being preceded by the command, ***At (so many) yards.*** (Rule 1.)

186. To form line on the right (left) from section or double section column.—The command is: 1. ***On right (left) into line,*** 2. ***MARCH.*** Executed as in ***Right into line,*** except that the second section in the column inclines to the left in order to clear the leading section and that each section passes beyond the preceding one before turning to the right. Rule 1 applies, except that the leading section is halted on advancing three carriage lengths after the completion of its change of direction. Line may also be formed at closed intervals, the first command being preceded by the command ***At (so many) yards.***

187. To form flank column from section column.—The command is: 1. ***Flank column,*** 2. ***Right (left) oblique,*** 3. ***MARCH.*** Rear carriages of sections simultaneously oblique to the right and then to the left gaining their prescribed positions. Carriages in rear of the leading section close at the gait of the obliquing carriages. (Rule 1.)

188. To form line to the front from flank column.—The command is: 1. ***Right (left) front into line,*** 2. ***MARCH.*** Carriages on the right execute ***Right front into line;*** those on the left move by the right flank, each forming in section column behind the leading carriage of its section. (Rule 1.)

189. To form line to the flank at closed intervals from flank column. The command is: 1. ***At (so many) yards,*** 2. ***Right (left) into line,*** 3. ***MARCH. Right into line*** is executed, each section moving successively by the right flank. (Rule 1.)

190. To form section column from flank column.—The command is: 1. ***Pieces (caissons) front,*** 2. ***MARCH.*** The designated carriage of the leading section moves straight to the front; the other carriage of this section obliques in time to follow in the track of the designated carriage. The other sections execute the movement similarly. (Rule 2.)

191. To form double section column from flank column.—The command is: 1. ***Double section,*** 2. ***Right (left) oblique,*** 3. ***MARCH.*** Carriages on the left incline sharply to the right and move abreast of their right carriages. (Rule 1.)

192. To form double section line from line.—The command is: 1. ***Double section,*** 2. ***Right (left) oblique,*** 3. ***MARCH.*** In each section the rear carriage inclines to the right and places itself abreast of the leading carriage. (Rule 1.)

193. To form double section column from section column.—The command is: 1. ***Double section,*** 2. ***Right (left) oblique,*** 3. ***MARCH.*** Each section forms double section; carriages in rear of the leading one closing at the gait of the carriages which incline to form double section. (Rule 1.)

194. To form line from double section line.—The command is: 1. ***Pieces (caissons) front,*** 2. ***MARCH.*** Each section forms in section column. (Rule 2.)

195. To form section column from double section column.—The command is: 1. ***Pieces (caissons) front,*** 2. ***MARCH.*** Each section forms in section column successively. (Rule 2.)

196. To form flank column from double section column.—The command is: 1. ***Flank column,*** 2. ***Right (left) oblique,*** 3. ***MARCH.*** Each carriage on the right inclines sharply to the right and takes position in flank column at the prescribed interval. (Rule 1.)

197. Maneuvering when in double section.—Being in double section, the section is maneuvered as if it were a single carriage. Similarly, the double section line or column is maneuvered as explained for the order in line or in section column, with obvious exceptions due to the formation.

SECTION V

THE FORMATION IN BATTERY AND THE RESUMPTION OF A MARCHING FORMATION

NOTE.—Appropriate Training Regulations on the "service of the piece" should be studied in connection with this section.

198. Forming in battery.—*a.* Batteries of heavy artillery usually, and medium artillery frequently, are established in position from the march formation, each section being conducted independently to and established in position by its chief.

b. For light artillery, the double section line or column is the habitual formation preliminary to taking the order in battery; the former for unlimbering for action either to the front or to the rear, the latter for unlimbering for action to the flank.

c. In horse-drawn batteries, when going into position to fire or practice fire discipline, the battery commander, chiefs of platoon, and chiefs of section dismount. One of the buglers takes the battery commander's horse, the other the horses of the executive

and his assistant. The chiefs of section turn their horses over to the swing drivers of the pieces.

d. In horse batteries, cannoneers are usually dismounted before approaching the position.

199. The fifth section.—Normally, caissons of the fifth section are so disposed, prior to occupying a position, that they will be unlimbered simultaneously with the pieces, one on either flank.

200. Disposition of limbers (tractors).—*a.* At ceremonies and drills, limbers (tractors) are posted 25 yards in rear of their carriages, moving to their post at a trot. Limbering is executed at a walk unless otherwise ordered.

b. In active service, and in instruction simulating it, limbers (tractors) are conducted by the first sergeant to a place previously designated by the battery commander. They are disposed to take the best advantage of cover; drivers may be dismounted, and the horses (tractors), and matériel cared for; or, if so directed, the limbers may be drilled separately. Both in limbering and unlimbering, the gait is a walk unless otherwise ordered.

201. To unlimber to fire.—The command is: ***ACTION FRONT (REAR) (RIGHT) (LEFT).*** (Training Regulations, Service of the Piece.)

202. To limber.—*a. Horse-drawn batteries.*—The command is: ***LIMBER FRONT AND REAR (REAR).*** If in rear of the pieces the limbers move out simultaneously, inclining well to the left before moving into positions for limbering. If posted other than in rear of the pieces the limbers move toward the nearest flank of the position in section column, and, on approaching the position, the piece and caisson limbers separate and form two columns, each column moving toward the trails of the corresponding carriages.

b. Tractor-drawn batteries.—The command is: ***LIMBER LEFT (REAR).*** If the tractors have been posted in rear of the pieces the tractors move out simultaneously, inclining slightly to the left to limber left; they incline to the right to limber rear. If posted other than in rear of the pieces the tractors approach the nearest flank of the position in column and move in rear of the line of pieces.

203. Formations after limbering front and rear.—*a. To march in line.*—The command is: 1. ***Pieces (caissons) front,***

2. ***MARCH.*** Designated carriages move straight to the front, others execute a right about and increase the gait as necessary.

b. To form double section line.—The command is: 1. ***Form double section line,*** 2. ***MARCH.*** Caissons stand fast, pieces incline to right, execute left about, and place themselves on the right of their respective caissons.

c. To form flank column.—The command is: 1. ***Flank column,*** 2. ***Pieces by the right (left) flank,*** 3. ***MARCH.*** All carriages move by the flank toward the direction indicated, caissons maneuvering as necessary to form flank column.

d. To form double section column.—The command is: 1. ***Double section,*** 2. ***Pieces by the right (left) flank,*** 3. ***MARCH.*** All carriages move by the flank toward the direction indicated, caissons maneuvering as necessary to form double section column.

204. Formations after limbering rear.—*a. To march in line.*—The command is: 1. ***Pieces (caissons) front,*** 2. ***MARCH.*** The designated carriages move as the leading carriages in each section.

b. To form double section line.—The command is: 1. ***Form double section line,*** 2. ***MARCH.*** Caissons stand fast, pieces move up on the left of their caissons and halt.

c. To form flank column or double section column.—Executed by the same commands and in the same manner as described in paragraph 203 *c* and *d*.

205. To march after limbering left (tractor-drawn 75-mm. gun batteries only).—The battery is in section column and may be maneuvered accordingly.

SECTION VI

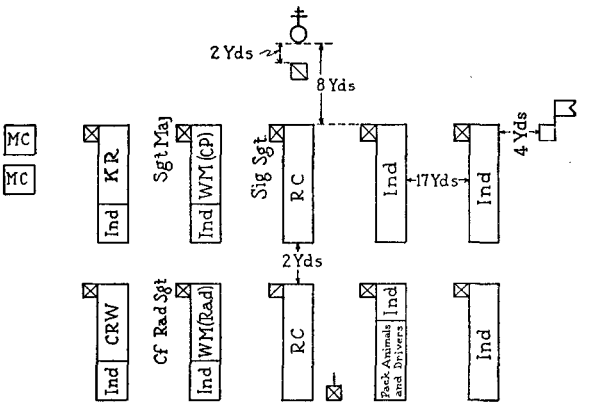
HEADQUARTERS BATTERIES, SERVICE BATTERIES, AND COMBAT TRAINS

206. Headquarters batteries.—The formations for ceremonies and maneuvers are given in Figures 22 and 23.

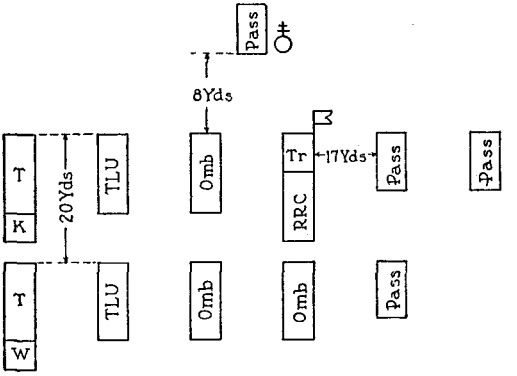
207. Service batteries.—*a.* The formation for ceremonies and maneuvers is given in Figure 24.

b. The band maneuvers at ceremonies as indicated in chapter 1, part 5, its transportation being a part of the service battery.

208. Battalion combat train.—The formation for ceremonies and maneuvers is given in Figure 25. It maneuvers similarly

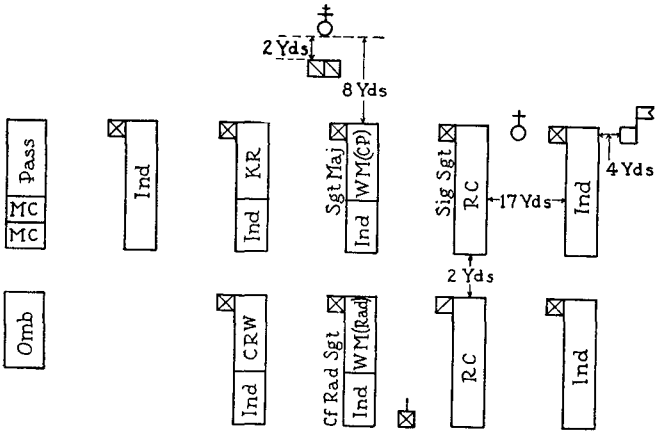


① 75-mm. gun, horse-drawn

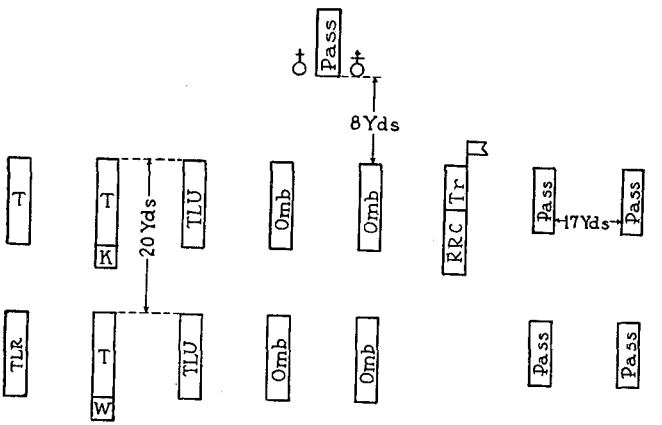


② 155-mm. howitzer, tractor-drawn

FIGURE 22.—Headquarters battery, battalion. (For explanation of symbols and abbreviations, see fig. 21)



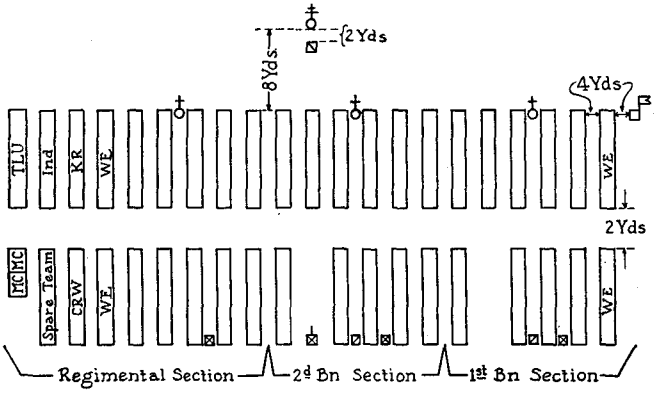
① 75-mm. gun, horse-drawn



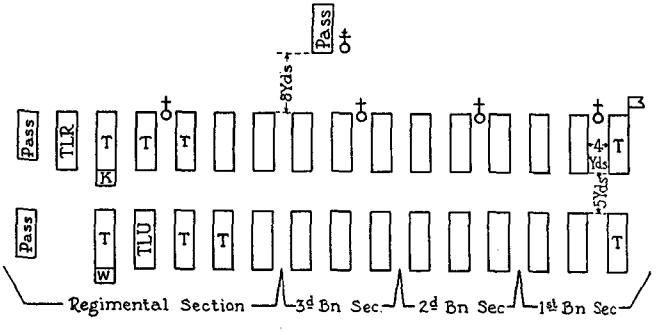
Note: Car (passenger, medium) for regimental commander not shown on Diagram.

② 155-mm. howitzer, tractor-drawn

FIGURE 23.—Headquarters battery, regiment. (For explanation of symbols and abbreviations, see fig. 21)

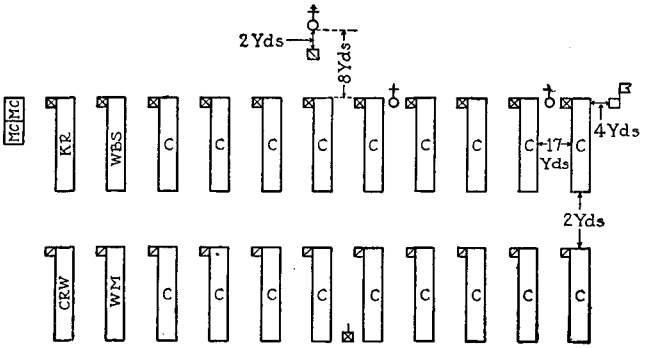


① 75-mm. gun, horse-drawn

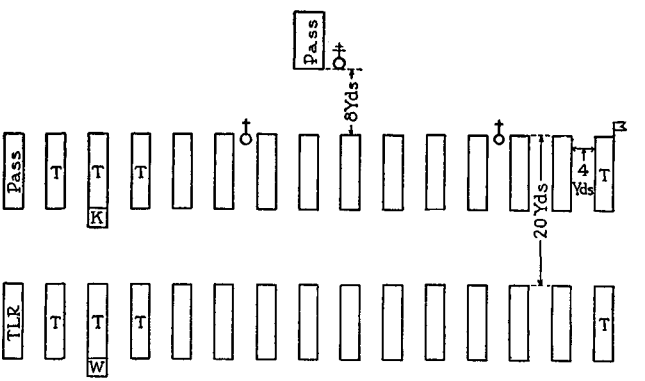


②155-mm. howitzer, tractor-drawn

FIGURE 24.—Service battery. (For explanation of symbols and abbreviations, see fig. 21)



① 75-mm. gun, horse-drawn



② 155-mm. howitzer, tractor-drawn

FIGURE 25.—Battalion combat train. (For explanation of symbols and abbreviations, see fig. 21)

to a gun or howitzer battery. At formations it is posted on the left of the gun batteries.

209. Battalion headquarters battery and combat train.—This unit, a peace organization, is maneuvered similarly to a gun or howitzer battery and at formations is posted on the right of the gun batteries.

SECTION VII

THE BATTALION, REGIMENT, AMMUNITION TRAIN, AND BRIGADE

210. The battalion.—*a. Formations.*—(1) These are similar to those of the battery. (Par. 159.)

(2) Normally, the interval between batteries in line or in battery is twice the interval between the sections of the batteries. The distance between batteries in section, double section, and flank column is one carriage length.

(3) When formed in column, batteries in the order in line, the formation is termed *column of batteries.* If the batteries are in the order in double section line the formation is termed *column of batteries in double section line.* The distance between batteries is one battery front unless *closed in mass,* when the distance becomes a carriage length.

(4) When formed in line, batteries in the order in section (double section) (flank) column, the formation is termed *a line of section* (*double section*) (*flank*) *columns.* Full interval in each case is, respectively, such as would result if the batteries had executed a simultaneous change of direction to the right from a formation of the battalion in the order in section, in double section, or in flank column. Closed interval is one carriage length or such as the battalion commander may prescribe.

b. Posts of individuals.—(1) *The battalion commander.*

(*a*) *Order in line.*—Opposite the center of and 30 yards in front of the line of battery commanders.

(*b*) *Column of batteries.*—Thirty yards in front of the battery commander of the leading battery.

(*c*) *Order in section column, double section column, and flank column.*—Thirty yards in front of the leading carriages.

(2) *Commissioned staff.*—(*a*) *Horse-drawn battalions.*—In line 3 yards in rear of the battalion commander, the adjutant on the right 1 yard to the right of the battalion commander, the

remainder of the staff on the left of the adjutant in order of rank from right to left. The executive, when present, takes post 3 yards to the right of the post of the adjutant.

(*b*) *Tractor-drawn battalions.*—The car of those members of the commissioned staff not riding with the battalion commander is posted 5 yards behind the latter's car.

(3) *Noncommissioned staff and enlisted personnel.*—(*a*) *Horse-drawn battalions.*—In line 2 yards in rear of the commissioned staff, agents on the left, buglers on their right.

(*b*) *Tractor-drawn battalions.*—Vehicles of the enlisted personnel in line, 5 yards in rear of the car of the commissioned staff.

c. To form the battalion.—(1) *General rules.*—Officers draw and return saber with the battalion commander. Sabers are habitually drawn at ceremonies except when riding in motor vehicles. In the order in line, when batteries are being aligned, the battery commander of the right battery superintends the alignment from the flank nearest the point of rest; other battery commanders from the flank farthest from the point of rest. Battalions may be formed in any convenient formation. When formed other than as prescribed below, the adjutant joins the battalion commander when the formation is completed and reports the battalion formed.

(2) *Horse-drawn battalions.—Adjutant's call* having been sounded, the adjutant and sergeant major, respectively, post themselves facing each other a few yards outside the points where the right and left of the right battery of the battalion are to rest. Batteries approach the line from the rear and are posted in succession from right to left, so that the heads of the lead horses will be on the line established by the adjutant and sergeant major. When the right battery has been established, the sergeant major takes his post. All batteries are aligned to the right. The line being formed, the adjutant moves at a trot or gallop by the shortest line to a point opposite the center of the battalion and midway between the battalion commander and the line of battery commanders, halts, faces the battalion commander, salutes with the hand, and reports, "Sir, the battalion is formed." The battalion commander returns the salute with the hand and the adjutant then takes his post with the staff.

(3) *Tractor-drawn battalions.*—These battalions are formed in a similar manner with the following exceptions: The adju-

tant rides in a motor vehicle during the forming of the battalion, but while marking the line of the right battery the adjutant and the sergeant major are dismounted. The battalion commander and his staff dismount before receiving the report of the adjutant, and the latter is dismounted when rendering his report. Battery commanders dismount to align their batteries. Having aligned their batteries, they take their posts and remain dismounted until a movement has been ordered or a command to mount has been given.

(4) *To dismiss the battalion.*—The battalion commander commands: ***DISMISS YOUR BATTERIES,*** or sends appropriate instructions.

d. Maneuvers.—Commands of the battalion commander are transmitted by agents, or given by arm, saber, bugle, or word of mouth. Battery commanders repeat commands or give such commands as may be necessary; bugles are not used by batteries when maneuvering as part of a battalion. The battalion is maneuvered in accordance with the principles heretofore prescribed for a battery. The occupation of position is not effected by a formal maneuver of the battalion as such, but rather by the separate movement of each unit to its assigned position.

211. The regiment.—*a. Formations.*—Formations of the regiment are similar to those prescribed for the battalion, the intervals and distances between battalions normally being twice those between batteries. A formation in line with battalions closed in mass is termed *a line of masses.* The normal interval between battalions in this formation is two carriage lengths. The headquarters battery forms on the right and the service battery on the left of the battalions. At ceremonies the band is two carriage lengths to the right of the headquarters battery.

b. Posts of individuals.—At ceremonies the post of the regimental commander is opposite the center of the regiment and 30 yards in front of the line of battalion commanders. His staff takes post in general as prescribed for the battalion. (Par. 210.) The post of the standard is between the battalions of a 2-battalion regiment or between the batteries of the center battalion of a 3-battalion regiment.

c. To form the regiment.—Battalion commanders are informed as to the place and order of formation and form their battalions accordingly. When forming in line the adjutant indicates to the battalion commander of the right battalion the point of rest and direction of the front. The adjutant then takes post facing

the regiment, opposite its center and midway between the regimental commander and the line of battalion commanders. The regiment having been formed, the adjutant reports and takes his post in a manner similar to that prescribed for the battalion adjutant. (Par. 210.) When the regiment is formed other than as above, the adjutant joins the regimental commander and reports the regiment formed when the last unit is in place.

d. Maneuvers.—The regimental commander's commands are usually transmitted by agents. Battalion commanders maneuver their battalions so as to place them in the formation desired.

212. The ammunition train.—The order for forming is: Train headquarters battery; ammunition batteries, the wagon battery on the right. The vehicles of the ammunition battery are in double rank. At ceremonies the ammunition train is formed as prescribed for a battalion. (Par. 210.)

213. The brigade.—At ceremonies, the brigade is usually formed in line of masses. Commands of the brigade commander are transmitted by agents.

PART FOUR

SHELTER IN THE FIELD, MARCHES, FIELD EQUIPMENT, AND MOVEMENTS BY RAIL, WATER, AND TRUCK

CHAPTER 1

SHELTER IN THE FIELD

214. Controlling factors.—Shelter in the field is governed by tactical requirements when in the presence of the enemy; otherwise, the location, type, and assignment of shelter are based upon the purpose to be fulfilled, the comfort of troops, and the necessities of sanitation, administration, and supply.

215. Classification.—The varieties of shelter in the field are termed bivouacs, camps, cantonments, and billets. Bivouacs are for short occupancy; Field Artillery uses shelter tents and paulins, or improvised expedients, for personnel. Bivouacs facilitate readiness for action. Camps are of longer duration. Heavy canvas is issued for shelter of personnel, and open sheds are constructed for animals. Sanitary measures and means are more elaborate; water is piped. In cantonments, frame buildings, huts, and sheds are provided for shelter. In camps

and cantonments, extensive measures are taken by the troops themselves to increase their comfort; and in bivouacs and billets, to the extent warranted by tactical conditions. Billeting is the use as shelter of private and public buildings and utilities by troops. (Basic Field Manual, Vol. VIII.)

216. Selection of camp sites.—*a.* Camp sites should have abundant pure water, easily obtainable; satisfactory drainage; proximity to highway, but distant enough to be free from dust and noise; porous soil with tough turf; firm footing for motor vehicles; supplies readily obtainable; sufficient area to accommodate the command; weather exposure conducive to comfort and good health. Concealment from air reconnaissance is an essential characteristic of bivouacs in the combat zone. Dusty, polluted, or damp soils, proximity to stagnant water, and dry stream beds are to be avoided. Agricultural and industrial conditions render ideal camp sites scarce in time of peace. In campaign, when contact with the enemy is likely, tactical necessity frequently forces the use of inferior sites. As a consequence of these conditions, commanders will generally have to exercise considerable ingenuity to utilize the sites that may be available.

b. Camp sites should be selected at least 24 hours in advance of the arrival of the command. A suitable detail should be sent forward to select the site of the camp or to locate billets. Such a detail is known as a quartering party and is normally under the command of an officer. In large commands each battery or similar unit is represented by a quartering party consisting of an officer, a noncommissioned officer, and a private. Regimental and brigade quartering parties include also the supply officer, a medical officer, and the veterinarian. Quartering parties are charged with the selection of sites and billets for each unit of the command; the preparation of maps and sketches to facilitate occupation of the camp site; guiding the units upon their arrival; making appropriate arrangements with respect to supply; in the case of billets, informing the commander of troops with regard to local standing orders and instructions.

217. Camp formations.—*a.* Field Artillery usually bivouacs, camps, or is billeted by battalion; batteries should only be separated from their battalions for tactical reasons. Elements should be arranged in bivouacs as shown in Figures 26 to 31, inclusive.

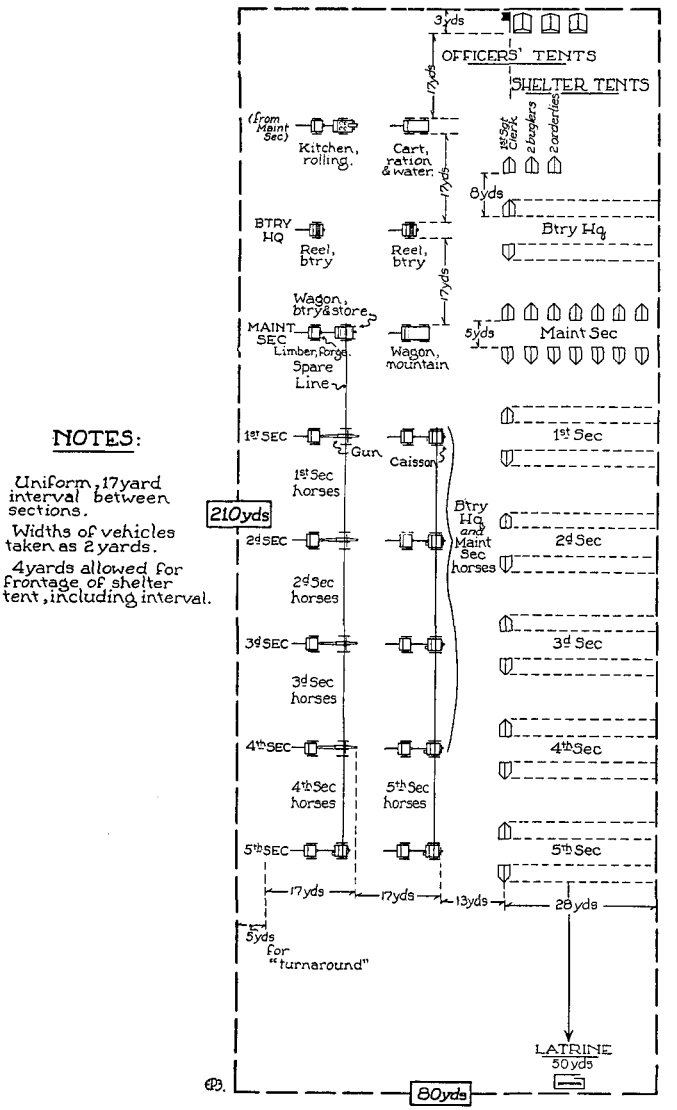


FIGURE 26.—Battery bivouac, 75-mm. gun, horse-drawn

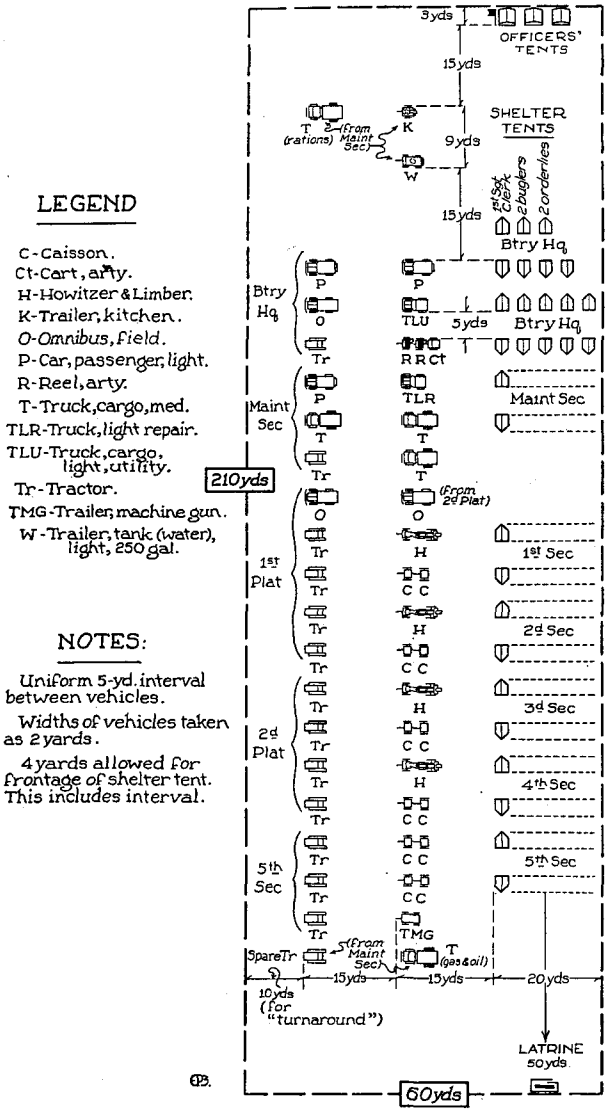


FIGURE 27.—Battery bivouac, 155-mm. howitzer, tractor-drawn

b. Motorized artillery may bivouac along the roadside, using one or both sides of the road, with the vehicles off the road and parallel or normal thereto, depending upon the space available. The road must be kept open for general traffic, with sentinels and warning lights judiciously located. Tents and facilities are set up off road, paralleling the vehicle formation, or in the spaces therein.

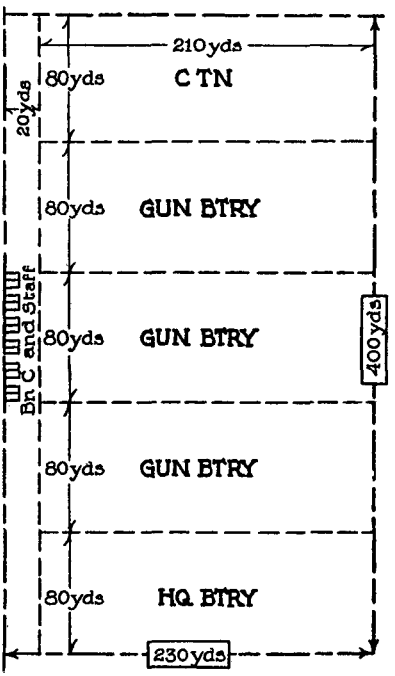


FIGURE 28.—Battalion bivouac, 75-mm. gun, horse-drawn

c. Under service conditions regimental or brigade encampments will seldom be practicable, as irregular distribution of troops for concealment from air observation will be necessary.

d. The arrangement of camps of motorized artillery must be such as to reduce to a minimum the danger from fire. Kitchens

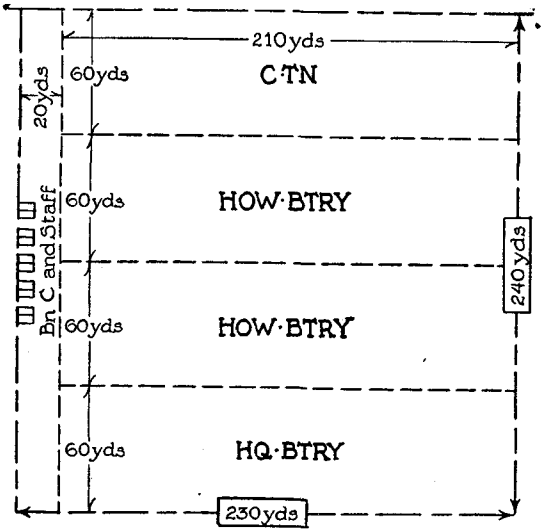


FIGURE 29.—Battalion bivouac, 155-mm. howitzer, tractor-drawn

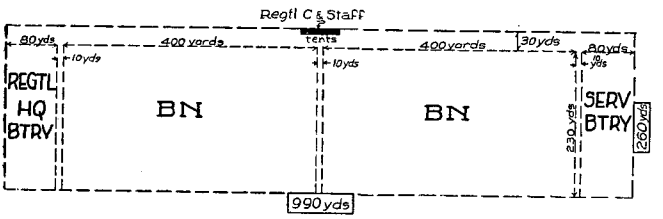


FIGURE 30.—Regimental bivouac, 75-mm. gun, horse-drawn

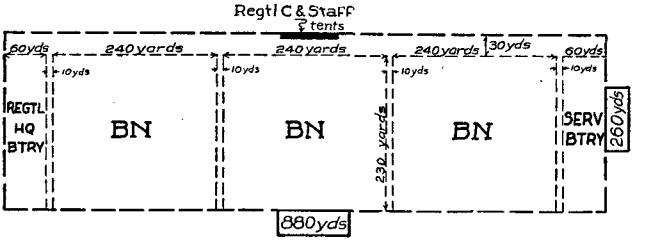


FIGURE 31.—Regimental bivouac, 155-mm. howitzer, tractor-drawn

must be placed as distant as practicable from stores of gasoline and oil.

218. Assignment of areas.—*a.* In accordance with the tactical situation, the commander of a unit assigns bivouac, camp, or billeting areas to the next smaller commands, and the commanders of the latter locate their respective commands to the best advantage in the areas assigned them. The integrity of units should be maintained and the mixing or dispersion of units avoided.

b. In marches in time of peace, and in war when tactical requirements do not forbid, information should be obtained by quartering parties in time to permit the assignment of areas and the location of units and facilities to be published in written orders.

c. In the assignment of billets special care must be taken to avoid the dispersion and mixing of units. Personnel is billeted by section, with its vehicles and animals near by. Assignment should include the designation of assembly points for routine and emergency formations.

d. Motorized units should, when practicable, be assigned locations near the road. The character of the footing should be considered in connection with the type of vehicle to be accommodated; tractors, for example, may often occupy ground too soft for other vehicles, while trucks should not be assigned locations on soft ground or on soil which will become soft due to rain or snow. Vehicles and units should be located with regard to convenience in servicing, and vehicles which will be likely to leave and return frequently should have easy access to the route which they will follow. Heavy vehicles, when the footing is poor, should be placed nearest the road when necessary to park them off the road.

e. Field trains may be assigned locations with their units; service trains usually occupy rear areas. Headquarters of larger units are usually placed as close as possible to the main roads.

219. Making camp.—*a.* In general, the usual procedure in the occupation of a camp by horse-drawn batteries is indicated as follows: Each battery parks without trespassing on the area of another. Horses are unhitched and unharnessed while the cannoneers stretch the picket line, after which the animals are tied on the line. Drivers rub the backs and legs of their animals until dry, then clean bits and bearing surfaces of col-

lars, collar pads, martingales, etc. If the noon grain has been fed on the road, the animals are fed one-third of the hay ration; if grain has not been fed and it is the hour for feeding grain, one-third of the grain ration is fed and one-third of the hay ration is distributed. The battery is formed and shelter tents are pitched. If the noon meal has been eaten on the road, the pitching of tents is followed by stables; otherwise, the noon meal may be served before stables. Sick call is held shortly after making camp. During stables the animals are watered; the remainder of the hay ration is placed on the line during the absence of the animals at water. If the animals are not sufficiently cooled off when stables begin, it may be advisable to groom before watering. During grooming, careful inspection of the animals is made and all sickness, injuries, and needed shoeing is reported. Harness is cleaned and inspected and vehicles examined, cleaned, and lubricated. All animals, vehicles, and equipment are given the necessary care and repairs to fit them for the next major duty. At afternoon stables, held about 4.30 p. m., animals are watered and fed the remaining one-third of the grain ration.

b. The above, with obvious modifications, applies to motorized units.

220. Picket lines.—*a.* In horse-drawn units in bivouac or temporary camp, the animals are tied on picket lines stretched between the vehicles; in general, two lines are provided, one along the line of pieces and one along the line of caissons. The lines are secured to the top of the felloe of one wheel of each of the adjacent carriages. Animals are grouped by teams and sections.

b. When time is available, continued improvement of picket lines is carried out. Durable stands are constructed by providing two longitudinal drainage ditches, 24 feet apart, with the dirt thrown to the center, and crowned with cinders, sand, or crushed rock, well tamped. Wire cable, stretched 5 feet above the ground and fastened to securely embedded posts, is desirable in place of the picket rope. A rock base should be provided for the stand when practicable, and, in sandy soils, feed racks and boxes are constructed. In camps of long duration, shelter should be provided for animals.

c. Animals should be tied on the picket line with halter shanks of just sufficient length to allow them to lie down imme-

diately under the line. Kickers and biters should be tied separately.

d. To prevent exposure to contagion and to avoid dispersion of animals, it is advisable to use picket lines when troops are billeted, except in extremely severe weather or when the use of such lines would unduly expose the command to air observation.

221. Disposition of harness and horse equipment.—For harnessing and unharnessing wheel pairs are tied to the left wheels of limbers, swing pairs to the right wheels of limbers, and lead pairs to the right rear wheels of carriages. Before unharnessing the swing driver places the pole prop under the pole to relieve the automatic pole support of the harness weight; after harnessing he returns the prop to its traveling position. In unharnessing drivers place their saddles astride the limber pole in the order of pairs in teams, wheel-pair saddles next to the footboard, the near saddle of each pair to the rear. Pommels of wheel saddles are to the front, others to the rear. Wheel traces are detached from the collars only and are laid back, with the neck yoke, on the footboard. Each saddle is placed with its attachments over it, the blanket across the saddle, the bridle, collar, and traces (except wheel traces) over the blanket. The horse equipment of the chief of section, and, in horse artillery, those of the gunner and of cannoneers Nos. 1 and 2, are placed on the footboard of the piece limber; those of the caisson corporal and mounted cannoneers Nos. 3, 4, and 5 on the footboard of the caisson body; those of mounted cannoneers Nos. 6 to 9, inclusive, on the footboard of the caisson limber. In a caisson section the horse equipment of the chief of section and of mounted cannoneers with the first caisson are placed on the footboard of the first caisson limber; those of the caisson corporal and of other cannoneers of the section are placed on the footboard of the second caisson limber. The horse equipment of other mounted men is disposed as may be directed by the battery commander. The harness and horse equipment are covered with paulins securely tied in place. The order of harnessing in the field is: Collar, bridle, saddle, traces, couple, yoke. The order of unharnessing is: Unyoke, uncouple, traces off, unsaddle, unbridle, collar off.

222. Tent pitching.—*a.* Field artillery units ordinarily pitch shelter tents in the formations indicated in Figures 26 and 27. At the command of the first sergeant, ***Form for shelter tents,***

the men, carrying their personal equipment, rolls, and saddlebags, fall in with their sections. The formation of the battery is, in general, that of a column of squads facing the kitchen flank of the battery, with increased distances between squads to facilitate pitching camp. Each section is formed, under the direction of its chief of section, into two squads, or two units of approximately equal strength, facing each other, the rear squad facing the kitchen flank of the battery and the section being generally opposite the carriages of the section. Each chief of section takes post on the left flank of his rear squad, being covered in the rear rank. The first sergeant aligns the flanks of the squads nearest the carriages and supervises the spacing of the squads. The first sergeant having paired off the extra men, intervals are taken and tents pitched. (Basic Field Manual, Vol. II.)

b. Tents are usually struck and rolls made without formality. For formal execution, tents are struck in the manner similar to that prescribed in Basic Field Manual, Volume II. After the rolls are made, chiefs of section form their sections in column of squads. Heavy tentage is pitched and struck as provided in Basic Field Manual, Volume II.

223. Breaking camp.—In general the procedure of a horse-drawn battery in breaking camp is as follows:

a. Immediately after reveille and before breakfast the men feed the animals, perform their toilets, strike tents, and make up their rolls. After breakfast the battery is formed and the drivers and individually mounted men report to the picket line for watering, grooming, and harnessing. The cannoneers are detailed to load wagons, police camp, close latrines, strike the officers' tents, and perform the other work that is to be done. When watering facilities are limited it may be necessary to harness some sections while others are watering. Animals are hitched immediately after they have been harnessed and watered. Before the start of the march the camp is thoroughly policed and sanitary precautions taken with respect to latrines, kitchen pits, picket lines, etc.; prior to departure camp should be inspected as regards police, sanitary conditions, and property which may have been inadvertently left behind.

b. The battalion commander prescribes the hour of reveille. When the battalion is a part of a larger command the hour of departure should be designated; if the unit is alone, the start is made as soon as the loading, hitching, and police are com-

pleted. The use of permanently assigned details will decrease the time necessary to break camp.

c. When the temperature is near or below freezing, time is usually saved if hand-cranked motors are started by towing. Some vehicles may be kept warmed up during the night by the guard so as to start easily in the morning, thus being available promptly for towing purposes. The use of hot water in radiators facilitates the starting of cold motors.

d. Time may be saved on the road for motorized units by utilizing personnel in a light motor column for policing camp; the heavy column starts first and is overtaken on the road by the light column.

224. Water supply.—*a.* Immediately upon making camp a guard should be placed over the water supply. If water is obtained from a stream, places should be designated, beginning upstream, for drinking and cooking, for watering animals, for bathing, and for washing clothes, in the order named.

b. The use of water from unauthorized sources should be prohibited. Water that is not known to be pure should be boiled for 20 minutes, allowed to cool, and then aerated by pouring it from one clean container into another; it may be purified by chlorinating it or by filtering through approved apparatus supplied for the purpose.

c. Dipping water from approved receptacles or the use of a common drinking cup should be prohibited.

d. On the march and in camps, the daily requirements of water may be estimated at 6 gallons per man, five gallons per motor vehicle, and 10 gallons per animal. In permanent and semipermanent camps the supply should be sufficient to provide from 25 to 30 gallons per man and 20 to 25 gallons per animal, truck, or tractor.

225. Kitchens.—*a.* Food should be protected from flies, dust, rain, and sun. Facilities must be provided for cleansing and scalding the mess equipment of the men. Kitchens and the ground around them must be kept scrupulously clean.

b. Solid refuse should be burned promptly, either in the kitchen fire or in improvised incinerators. In camps of any duration incinerators should always be constructed if the necessary fuel for their operation can be procured. An incinerator for each kitchen is the most convenient arrangement.

c. In temporary camps, liquid refuse from kitchens should be strained through sacking, or other screening, into seepage pits

dug near the kitchen. The pits should be filled and plainly marked when the camp is abandoned. Liquid which appears on the surface of the ground should be carefully covered with sand or sprinkled with lime.

d. In billets a building is desirable for use as a combined kitchen and mess.

226. Watering and feeding animals (Basic Field Manual, Vol. V).—*a.* At stable call the battery is assembled and absent drivers are replaced by cannoneers. Certain cannoneers are detailed to break open bales of hay, restretch the picket line, fill feed bags, etc. The drivers proceed to the picket line, untie the animals, and form for water. Under the supervision of an officer, the animals are then taken to water. If the watering place is restricted, the animals are watered by section, care being taken not to roil the water by unnecessary movement. While the animals are watering, the cannoneers spread hay on the line. After returning from water the horses are tied on the line and groomed while they are eating hay.

b. Horses should be watered frequently. In hot weather they should be watered two or three hours after the evening feed of grain. In the morning horses, after being fed at reveille, should be watered just prior to harnessing or as soon as possible after starting the march. If a very early start is made, horses normally need not be watered until about two hours on the road. Horses must be watered quietly and without confusion. They should be led, or ridden at a walk, to and from the watering place. Crowding should not be permitted, nor should any horse be hurried or taken from water before he has drunk his fill. The use of the snaffle bridle in watering, especially when horses are ridden out into the water, will facilitate the handling of the animals. They should be trained to drink with the snaffle bit in the mouth.

c. Animals should be fed as follows:

(1) At reveille, one-third of the grain ration; at midday, one-third of the grain ration; at stables, after watering, one-half to two-thirds of the hay ration; about 5 p. m., one-third of the grain ration. The remainder of the hay ration should be fed some time during the day. At the end of a march about one-third of the hay ration may be fed as soon as the animals are unharnessed and while the men are pitching tents. If the unit is remaining in camp, a portion of the hay ration may be fed in

the morning after the animals have been exercised and the remainder at stables.

(2) When animals are fed on the picket line, one man from each section must be on duty to see that the animals of his section do not toss off or tear their feed bags and that each animal gets his grain. When feeding on the march, each man watches his own animal.

(3) In billets, when animals are quartered in separate stables, the rations for them should be distributed to chiefs of section for each feeding. The chief of each section should supervise the filling of feed bags, and the division of hay for the animals of his section at some centrally located place, and should be held responsible for the proper watering and feeding of his animals.

227. Shelter for vehicles.—Except in billets occupied for long periods, no attempt is made to secure shelter for trucks, tractors, caissons, guns, or wagons. Camouflage or the cover of trees is relied upon to prevent observation from the air. It is not essential that vehicles be disposed in regular parks, although such an arrangement is desirable, but it is essential that they be kept in the area assigned to the unit.

228. Field sanitation.—*a.* The purpose of field sanitation is the prevention of sickness by extermination of disease-bearing insects, by preventing their access to infectible objects, and by sterilizing accessible disease germ sources. Sanitary measures include rigid requirements of cleanliness of camp areas and personnel; destruction of flies and mosquitos and their breeding places; protection of food and men from contact with insects by screens and mosquito bars; disinfection of polluted ground, especially in the vicinity of kitchens, latrines, picket lines, and locations previously used for such installations; sanitary disposal of kitchen refuse by incineration or by burial; obtaining and maintaining pure or potable water; inspection for and segregation, or removal, of disease carriers. (Basic Field Manual, Vol. VIII.)

b. Upon making camp, a guard is placed over the authorized designated sources of water supply (par. 224); kitchen and latrine locations are specified; sources of possible infection are determined, corrective measures taken, and, if necessary, sources placed under guard; kitchen pits are dug. The scope of the initial sanitary measures ordered will vary with the length of time that the camp is to be occupied and the sanitary conditions existing at the time of its occupation.

c. Daily routine in a camp occupied for more than one day should include the following: Thorough police of the entire area and burning of refuse; raising of tent walls and airing of bedding and clothing, weather permitting; burning out or other disinfection of latrines; scalding of mess kits; rigid inspection of kitchens and mess equipment, and means of garbage disposal; sick call; disinfection of polluted soil around kitchens, latrines, and picket lines.

d. Before marching, camps should be thoroughly policed, all refuse burned or buried, all trenches or pits filled in and their location marked, and all fires extinguished. An inspection should be made by every organization commander before leaving camp to see that sanitary measures are complete.

e. Special care must be exercised with respect to sanitary conditions when troops are in billets. All billets should be inspected before occupation and after evacuation, and their condition noted and reported upon. Frequent daily inspection by officers should be made of the billets of men and animals.

229. Security.—*a.* In campaign, the general security of the camp is usually provided by outposts and outguards furnished by the other arms. Field artillery must always take the necessary precautions to prevent surprise, especially against air attack, and provide for its own immediate security, even though the security of the camp is the responsibility of another arm. Antiaircraft protection by the machine guns or automatic rifles of the unit must be available at all times.

b. The artillery furnishes its own interior guard, by battalion or regiment. The guard must be adequate to provide sentinels from each battery for its picket lines and parks, to enforce orders with respect to water supply, prisoners, etc., and to guard property.

c. In motorized units the guard has additional duties, including exercising special attention to the discovery and prevention of fires, and, in cold weather, operating certain vehicles during the night in order to facilitate the starting of motors in the morning.

230. Forward and rear echelons.—*a.* In combat it is desirable that the number of men, horses, and vehicles of any unit brought under fire be reduced to the minimum necessary for the efficient service of the pieces. Accordingly it is usual, when the time element warrants, to divide the personnel and activities of field artillery units into forward and rear echelons.

b. Forward echelons comprise such personnel, matériel, and equipment of units as are located at the battery positions and at the observation posts and command posts. The regimental service battery has no forward echelon; this unit is usually stationed at the rear echelon of the regiment.

c. Rear echelons should be sufficiently in rear of the front lines to be beyond the reach of other than long-range guns. At this position will be found all of the personnel, matériel, animals, and administrative and supply services which are not needed at the battery positions, observation posts, and command posts. These echelons should be easy of access for supply, preferably on main roads. The sites selected should have easy access to good water, should provide concealment from air observation, and should be sufficiently large to permit of sufficient dispersion of men, animals, and vehicles to minimize losses in case of air attack. Sites should lend themselves to the construction of shelter for men and animals. Rear echelons should be so located that they can efficiently supply the batteries, provide the maximum care for animals, and facilitate rest, instruction, and training of personnel. They are usually organized by battalion or regiment, seldom by battery or brigade. Frequent inspection by battalion, regimental, and brigade commanders should be made.

d. Since supply to forward units is generally carried out at night, special care must be exercised in the organization of rear echelons to provide for the proper rest for animals and men and to insure that watering, feeding, and grooming are efficiently carried out.

CHAPTER 2

MARCHES

231. Classification.—*a.* Marches may be classified under two general heads—those executed in the actual or assumed presence of the enemy in which tactical considerations govern, and those executed in the absence of the enemy.

b. The battalion is the march unit in horse-drawn and pack artillery; the battery, in motorized artillery.

c. When practicable, motorized artillery units should march in a separate column from other troops.

232. Preparation for a march.—*a.* When a march is contemplated, the division or other appropriate unit commander should issue a warning order and notify subordinates of the

route, length, and duration of the march, and such administrative and supply arrangements as are pertinent. The higher artillery organization commanders should issue schedules showing where the different organizations will camp each night and instructions relative to administration and supply. Based upon these instructions, battery commanders issue the verbal orders and instructions necessary to insure that everything is in readiness in the battery for beginning the march at the time ordered. These instructions cover the subjects of animals, matériel, administration and supply, clothing, tentage, and equipment, including equipment to be turned into the Quartermaster Corps or other supply services.

b. Every effort should be made to keep animals of an organization in condition by routine conditioning. Marches should be prescribed early in a training program. They should be made with full field equipment, under strict march discipline, with campaign conditions simulated when practicable. The distances marched should be increased gradually until the normal daily maximum is reached. (Par. 235.) In war, soft remounts will frequently be furnished; every effort must be made to work and condition these remounts even during the course of active operations.

c. Animals should be carefully inspected before starting a march to see that they are fit for work, and a special effort should be made to spare those not in condition. It will often be possible to vary the loads in such a way as to spare a team, or it may be advantageous to transfer, temporarily, certain pairs or entire teams.

233. Formation of columns.—*a.* When contact with the enemy is probable, the order of march is such as to facilitate development in accordance with the probable plan of action, and the dispositions should be such as to provide for defense against air attack. The field artillery brigade pertaining to an infantry division will seldom march as a unit, but will be broken up into regiments and battalions, depending upon tactical considerations and the column grouping of the division. When a division is marching in two or more columns a portion of the artillery brigade may be attached to each column, and the commander of each artillery unit so attached should march with the column commander. Frequently batteries or battalions of horse-drawn artillery are attached to advance guards, flank guards, or rear guards. Combat trains, except those

pertaining to units in the advance, flank, or rear guards, are grouped and marched in rear of the combat troops of the main body. Field trains are grouped under the commander of trains with the other field trains of the column to which they pertain, and are marched near the tail of the column.

b. Due to the relatively great length of motorized artillery units and to the different rates of speed of the different vehicles in the units, brigades of motorized artillery are, for march purposes, broken up into regiments and the regiments marched on separate roads in one or more columns, dependent on the speed of the various elements. The assignment of roads is a duty of higher authority.

c. As the economical running speeds of the different types of vehicles composing a tractor-drawn unit vary greatly, it is advisable for march purposes to divide the unit into a heavy motor column and a tractor column. In addition, a light motor column may be formed when desirable. Tractor-drawn and portée artillery do not ordinarily march in the same column on account of the difference in speed between the tractors and trucks.

234. Starting a march.—In general, when tactical or other paramount considerations do not require a different hour, the march should start about an hour after daylight. The hour designated should permit proper performance of premarch duties. Starting a march in darkness is preferable to ending it in darkness.

235. Rates and distances.—*a.* The rate of march of artillery, when marching in a mixed column, is governed by that of the troops with which it is marching.

b. Rates of march vary, depending upon the type of road, grades, and climatic conditions. Marching alone, the following are average rates and distances:

	Hourly (miles per hour, including halts)	Daily (miles)
Light artillery:		
a. Horse-drawn	3 - 4	15–25
b. Horse artillery	3½- 5½	25–30
Pack artillery	3 - 3½	15–25
Portée artillery	5 -10	40–80
Tractor artillery	3 - 4½	25–35

c. When animals of a unit are not in condition, the first two or three days of an extended march should be comparatively short, the first day's march not exceeding 7 to 8 miles, the second 10 to 12 miles, and the third 14 to 16 miles.

d. The maintenance of a good average rate throughout the entire march is to be desired. In horse-drawn artillery the walk should be alternated with the trot under favorable road conditions for periods of 15 or 20 minutes to maintain alertness and provide relaxation from walk fatigue.

236. Gaits and speeds.—*a. General.*—(1) In relatively long artillery columns, such as the regiment and brigade, if the road is assigned to the artillery alone and tactical considerations permit, the battery may be designated as the march unit when the column is moving over difficult terrain. In such cases each march unit maintains a gait that will keep it within the prescribed distance of the unit in front.

(2) Elements such as carriages or pack animals, which fall out of column for any reason, regain their proper positions in the column at the next succeeding halt or halts; horse-drawn units regain position at the trot if the condition of the animals, distance, and road conditions permit, and motorized units and pack animals at their normal speed or gait.

(3) When a distance much greater than the normal is to be marched, it is accomplished by marching a greater number of hours per day than is normal, and not by marching faster or omitting halts. The night halt in forced marches may be a short bivouac of four to six hours.

b. Horse-drawn artillery.—No gait should be maintained without a break, as men or horses become wearied. Trot periods should not exceed 20 minutes. In relatively long columns successive march units should effect the change in gait on the same ground unless the terrain presents flat stretches at least twice the length of a 2-battalion column. Once or twice during each daily march, when the roads are good and the unit is at a walk, the drivers and individually mounted men should be required to dismount and walk. The loss in draft efficiency, however, due to the fact that the drivers are dismounted, more than offsets the advantage gained by relieving the near horse of the driver's weight. The main purpose of dismounting is to rest the drivers. Wheel drivers must be mounted when descending hills.

c. Motorized artillery.—(1) The speed of a tractor-drawn organization is governed by the speed of the leading vehicle, which moves at a pace regulated by that of the slowest moving vehicle in the organization. The march unit commander must control the speed of the leading vehicle to conform to the possibilities of the slowest vehicle in the unit.

(2) Distance between tractors is measured from the rear of the tractor load to the radiator of the tractor immediately behind. The following distances should be maintained:

(*a*) Outside of towns, at average speed, between trucks, 20 yards; between tractors, 5 yards.

(*b*) Between vehicles passing through towns, 5 yards.

(*c*) Between vehicles halted, 2 yards.

(3) After ascending or descending a slope, leading vehicles should slow down or stop to allow the rear vehicles to close up to proper distances. Sufficient distance at the top or bottom of the slope should be left for all vehicles of the command before the leading vehicle is halted.

237. Conduct of the march.—*a.* Field artillery habitually marches in section column and at route order. Elements of march units should be rotated daily in the leading position. If, while marching, an obstacle is encountered by any subdivision, its chief, without waiting for orders, takes appropriate action for negotiating or avoiding the obstacle. (Pars. 143, 144, 145, and 146.)

b. When a carriage falls out of column for adjustment or repair it is drawn well off the road to the right, if possible, and when again ready to resume the march, it takes the first convenient place in column, regaining its proper place at the first or succeeding halts, the necessary space being left in the column for that purpose.

c. If the strength of bridges en route has not been previously determined, they should be carefully inspected before a crossing is attempted. Unless there is an ample margin of safety, the distances between carriages are increased so that not more than one carriage will be on any single span at one time. To reduce the strain on bridges, all carriages should be kept moving, and in tractor-drawn units the tractors may be uncoupled and crossed separately, the loads being drawn across by towing or by the use of a winch. Similarly, in horse-drawn units the teams may be unhitched and crossed separately, the carriages being crossed by hand or long tow rope. Should any bridge or

culvert be weakened or destroyed by the passage of an artillery unit, the necessary repair is a function of that unit, unless other troops have been detailed for that duty. (See ch. 10, Basic Field Manual, Vol. VIII.)

d. Fords should be carefully inspected before their passage by field artillery troops. The route should be carefully marked and cannoneers should be stationed at critical points to render such assistance as may be necessary.

e. Railroad crossings should be guarded by markers. A marker is detailed by each battery commander in turn as his unit approaches the crossing and remains on duty until his unit clears the crossing. The guidon or a bugler is usually selected for this duty.

f. In heavy artillery units it is often necessary to employ tandem or triple draft in order to accomplish the passage of bad hills or particularly difficult pieces of road.

g. When the routes of two columns cross causing interference, the one halts which is so directed in orders, is off its route, is on a less urgent mission, or is under the junior commander.

238. Towns.—Cordial relations should be established with the authorities of municipalities to be passed through. Arrangements should be made as to streets, water, and utilities; pertinent ordinances should be noted and scrupulously observed. When feasible, columns use side streets, avoid congested districts, and march well closed up. Police escort should be requested, especially for motor columns passing through large cities.

239. March discipline.—*a.* Constant and thorough supervision by officers and noncommissioned officers is essential to good march discipline. They ride where they can best supervise the march of the units they command, being careful, however, to avoid delaying traffic on the road when riding or driving on the left flank of the column.

b. On level ground cannoneers ride on the carriages, both in horse-drawn and tractor-drawn units; at times they may be required to walk, in which case they keep to the right of the column or in the intervals between sections and to the right of the left line of wheels. Under no circumstances should dismounted men march between the front and rear wheels of a limbered carriage. Cannoneers should be required to remain with their sections. A driver on foot marches beside his near horse.

c. Straggling, falling out of column, lounging in the saddle or on the carriages, and failure to keep to the right of the road are evidences of poor march discipline, and all officers and noncommissioned officers should be constantly on the alert to prevent the occurrence of these faults.

d. Artillery always marches well to the right of the road. On 2-way roads the left side of the center line must be kept clear. At halts artillery pulls well off the road to the right.

e. When marching on paved roads all wheels should habitually be kept on the pavement in order to preserve even and uniform draft.

f. Under no circumstances should any man leave the column unless authorized. If the absence is to be for some time, he must be given a pass showing his name, grade, organization, and the reason why he is permitted to be absent from his command. If sick, he should wait by the roadside for the arrival of the surgeon or ambulance.

g. Canteens should be filled the evening before the starting of a march; they are not refilled on the march except from authorized sources.

h. When a cooked meal or a lunch is carried, it should not be eaten until the prescribed time.

240. Halts.—*a. General.*—(1) The time and length of halts should be made known in advance, in order that full advantage of the time may be taken for adjustments and repairs and for care of animals and motors.

(2) When marching with troops of other arms or as part of a large unit, the time and duration of halts are dependent upon so many varying conditions that it is not always possible to give the desired advance information. In such cases organization commanders exercise their judgment in determining what adjustments and repairs may be made without delaying the column.

(3) For field artillery marching alone normal halts are as follows:

(*a*) For horse-drawn, horse and pack artillery:	
First hour	10 to 15 minutes.
Each successive hour	5 to 10 minutes.
(*b*) For motorized artillery:	
First hour	20 to 30 minutes.
Every two or three hours thereafter (for reservicing)	10 to 15 minutes.

(4) In very hot weather, on bad roads or in hilly country, halt periods should be longer and more frequent.

(5) Judgment should be exercised in selecting the place for the first halt; it should not be made in a village or other place where the objects of the halt would be defeated, and in no event should a halt be made in an exposed location when in the presence of the enemy. During halts, repairs and adjustments to motors should be made, harness and saddles adjusted, and men permitted to attend to the calls of nature.

(6) In making relatively long marches, either as to distance or time, a midday halt of from 30 minutes to 1 hour is made to permit the animals and personnel to rest and eat, and to make a thorough inspection of all animals and vehicles. Unnecessarily long halts on the road should be avoided, as both men and animals rest better in camp.

b. Horse-drawn units.—(1) All officers and men of horse-drawn units must be made to realize that the hourly halts are primarily for the purpose of caring for the animals.

(2) Any injuries caused by harness or saddlery must be discovered and reported at once and adjustments made to prevent further injury.

(3) During long, hard pulls organizations should be halted long enough to permit animals to blow.

(4) During the regular halts, drivers, assisted by such cannoneers as may be necessary, perform the following duties:

(*a*) Lower limber props.

(*b*) Raise the collars and collar pads.

(*c*) Examine the necks and shoulders.

(*d*) Wipe the sweat from the bearing surfaces of the collars and collar pads with a cloth and see that these bearing surfaces are clean and smooth.

(*e*) Examine the adjustment of the harness and packs, making any necessary changes.

(*f*) Look over the animals to determine their condition and locate abrasions; examine their feet to locate stones and loose shoes.

(*g*) Wipe out the animals' nostrils with a moist sponge.

(*h*) Remove mud from the bearing surface of the harness, particularly the martingales.

(*i*) When the draft has been such as to cause steady and constant pressure against the shoulders, stimulate circulation by

hand rubbing, being careful upon finishing to leave the hair smooth and flat.

(5) Drivers must remain constantly with their pairs. If for any reason a driver must leave his pair, a cannoneer should be substituted to remain with the pair during the driver's absence.

c. Motorized artillery (par. 124 *c*).—(1) Most of the motor troubles occurring in a day's march are experienced during the first hour; therefore a thorough inspection of motors, with appropriate repairs and adjustments, should be made at the first halt.

(2) During halts, especially the first, the lubrication of all vehicles must be carefully checked.

(3) Whenever a halt longer than a minute is made, motors are stopped and all personnel clear the road by moving to the right flank of the column.

241. Care of animals.—*a. Prevention of sore necks.*—(1) Care should be exercised to prevent sore necks. With the breast harness, as issued, the effect of placing a team in draft is to cause a pressure varying from 40 to 160 pounds to be transmitted to the neck of each wheel horse. In order to take this pressure from the wheel horses' necks, the traces should be supported by hold-up straps fastened to the stirrup staples of the saddles. The straps should be so adjusted that the traces in front of the hold-up straps will be in a horizontal plane when the team is in draft. The bearing surface of the saddle being large, the additional pressure resulting from the use of hold-up straps, varying from 60 to 200 pounds, will seldom cause trouble to the back. Hold-up straps are not needed on lead or swing animals.

(2) When a horse develops a sore neck and must be kept in draft, the neck strap and collar pad should be removed and the collar body supported by a double or forked strap with the double ends buckled in the buckles by which the neck strap is fastened to the collar; the single end is fastened by a snap to the front halter square of the quarter straps.

(3) Proper adjustment of the pole-support spring will result in obviating pressure on the wheelers' necks due to the weight and vertical whip of the pole. When necessary, the neck-yoke strap may be replaced by a quarter strap connecting the loop on the collar body with the ring at the end of the neck yoke. The adjustment of this strap should be such as to take care of

the horizontal swing of the pole. The employment of zinc collar pads also protects the neck. Collar pads must be kept clean. Good draft is essential to the prevention of sore necks.

b. Feeding.—On marches, both in time of peace and in time of war when possible, feeding should be at regular hours. Animals held to a long march without their midday feed become tired and irritable; therefore, grain should be carried for the animals and fed promptly at the noon hour, even though the destination be relatively near. In peace there is usually no sufficient reason why regularity of feeding should be interrupted. In war, feeding a little at every opportunity should be practiced; thus at no time is the horse's stomach overloaded and at no time is it entirely empty.

c. Watering.—(1) It is of the utmost importance that animals be properly watered on a march. After a hard march, animals should not be fed immediately, as they will not eat until partially rested, nor should they be allowed to drink their fill of cold water.

(2) An officer must be detailed to oversee the watering of the command, and each organization will be brought to the watering place and the animals watered under his supervision.

(3) In cold weather many animals refuse to drink early in the morning, but will drink after being on the road a few hours; therefore if a good place to water exists about one or two hours out, it is better for the animals to water there than before starting.

242. Night marches.—In campaign, night marches may be necessary as a means of concealment, or merely incidental to forced marches, or may be made, as in peace time, to avoid the heat of the day. Plans must be carefully prepared and clearly communicated in advance to the troops. Routes and camp sites are reconnoitered and unmistakably marked in advance. Discipline is scrupulously enforced. Personnel is kept awake while marching and not left behind after halts. Every precaution is taken to obviate uncertainty or loss of way, to maintain contact, and to provide concealment, especially from air observation. Smoking is controlled, lights are sparingly used and kept shaded from the air. The rate of march should not exceed 6 miles per hour for trucks and 3 miles per hour for tractors or mixed columns. Distances in general are reduced. Distinctive painting or marking on the rear of vehicles will help a driver in rear to see the vehicle ahead.

Disposition of individual equipment.—When taken into the field, articles are disposed as indicated in appropriate columns.

	Officers and warrant officers		Enlisted personnel		
	Horse, horse-drawn, pack artillery	Motorized artillery	Individually mounted	*Drivers, mounted units*	Other enlisted men
1	2	3	4	5	6
Bag, barrack	Bedding roll	*Bedding roll*	Field train	Field train	Field train.
Bag, cantle	Officer's saddle, offside	None	None	None	None.
Bag, feed	1 on pommel, 1 on blanket roll	None	On blanket roll	On off saddle	None.
Bag, grain	In feed bag	None	In feed bag	In feed bag	None.
Bag, musette	None	Slung, right shoulder to left side	None	None	None.
Bar, mosquito	Bedding roll	Bedding roll	Blanket roll	Blanket roll	Blanket roll.
Basin, and bucket, folding	Bedding roll	Bedding roll	None	None	None.
Bedding roll	Field train	*Field train*	None	None	None.
Belt, cartridge, pistol	Worn by warrant officer	Worn by warrant officer	Worn	Worn	Worn.
Belt, officer's	Worn straps crossed in rear	Worn straps crossed in rear	None	None	None.
Belt, waist	Worn	Worn	Worn	Worn	None.
Blanket roll	On saddle, officer's led horse	In officer's car	On saddle	On off saddle	Worn.
Blanket, bed	1 in blanket roll; 1 in bedding roll	1 in blanket roll; 1 in bedding roll	In blanket roll	In blanket roll	On artillery carriage, trailer, vehicle.
Blanket, saddle	1 on each horse	None	On mount	1 on each horse	In blanket roll.
Bolo	None	*None*	Worn, left side, belt (pack artillery)	Worn, left side, belt (pack artillery)	None.
Boots, pairs	1 worn; 1 in bedding roll	1 worn; 1 in bedding roll	None	None	Worn, left side, belt (pack artillery).
Breeches, pairs	1 worn; 1 in bedding roll	1 worn; 1 in bedding roll	1 worn; 1 in blanket roll	1 worn; 1 in blanket roll	None.
Bugle	None	None	Slung, left shoulder to right side	None	1 worn; 1 in blanket roll.
Canteen and cup	Near cantle ring, officer's saddle	In rear of left hip, when attached to belt	*Near cantle ring, saddle*	Near cantle ring, saddle off horse	Slung, left shoulder to right side.
Case, dispatch	Slung, left shoulder to right side	Slung, left shoulder to right side	Slung, left shoulder to right side	None	Worn, rear left hip.
Coat, service	Worn or in bedding roll	Worn or in bedding roll	Worn, or in barrack bag	Worn or in barrack bag	Slung, left shoulder to right side.
Drawers, pairs	1 worn; 1 in cantle bag; 2 *in bedding roll*	1 worn; 1 in musette bag; 2 in bedding roll	1 worn; 1 in off pocket, saddlebags	1 worn; 1 in off pocket, saddlebags	Worn or in barrack bag.
Fatigue clothes	None	None	None	None	1 worn; 1 in haversack.
Flash light	Off pommel pocket	Musette bag	Off pocket, saddlebags	None	Barrack bag *or worn.*
Glasses, field	As in note 3, or on belt	As in note 3, or on belt	Note 3	None	Haversack.
Gloves, any type	Cantle bag, or worn	Musette bag, of worn	*Near pocket, saddlebags or worn*	Near pocket, saddlebags or worn	Note 3.
Handkerchiefs	1 in pocket, uniform; 1 in cantle bag; 4 in bedding roll.	1 in pocket, uniform; 1 in musette bag; 4 in bedding roll.	1 in pocket, uniform; 1 in off pocket, saddlebags.	1 in pocket, uniform; 1 in off pocket, saddlebags.	Haversack or worn. 1 in pocket, uniform; 1 in haversack.
Hat, service	Worn *or on cantle bag*	**Worn or on musette bag**	Worn or on off pocket, saddlebags	Worn or on off pocket, saddlebags	Worn or on haversack.
Haversack	None	None	None	None	*By suspenders to belt.*
Head net, mosquito	Bedding roll	**Bedding roll**	Blanket roll	Blanket roll	Blanket roll.
Helmet, steel	Worn or on cantle bag	Worn **or on** musette bag	Worn or on off pocket, saddlebags	Worn or on off pocket, saddlebags	Worn or on haversack.
Holster, pistol	On belt at right hip	On belt at right hip	On belt at right hip	On belt at right hip	On belt at right hip.
Horseshoes (2 per animal; 1 fore, 1 hind (fitted))	Near pommel pocket or near patch pocket 2	None	Near patch pocket	Near patch pocket	None.
Housewife	Cantle bag	Musette bag	Off pocket, saddlebags	Off pocket, saddlebags	Haversack.
Kit, flag	*None*	None	Slung, left shoulder to right side	None	Slung, left shoulder to right side.
Kit, grooming (brush, currycomb, cloth, sponge)	Near pommel pocket	None	Off patch pocket	Off patch pocket	None.
Kit, mess (knife, fork, spoon, inside meat can)	Off pommel pocket	Musette bag	Near pocket, saddlebags	Near pocket, saddlebags	Haversack pouch.
Laces, extra, pairs	Cantle bag; bedding roll	Musette bag; bedding roll	Off pocket, saddlebags	Off pocket, saddlebags	Haversack.
Leggins, pairs	Worn or bedding roll	Worn or bedding roll	Worn	Worn	Worn.
Mask, gas (note 1)	In carrier or worn	In carrier or worn	In carrier or worn	In carrier or worn	In carrier or worn.
Nails, horseshoe (8 per horseshoe)	Near pommel pocket; near patch pocket	None	Near patch pocket	Near patch pocket	None.
Overcoat (worn, or carried as *indicated*)	*On cantle of* officer's saddle or bedding roll	Officer's car or bedding roll	Pommel of saddle	Pommel, saddle, off horse	On haversack.
Pistol	In holster	In holster	In holster or pistol chest	In holster or pistol chest	In holster or pistol chest.
Pocket, double, for pistol magazine	Left front belt	Left front belt	Left front belt	Left front belt	Left front belt.
Pockets, pommel, pair	Pommel, officer's saddle	None	None	None	None.
Pouch, first-aid	Left rear of belt	*Right rear of belt (note 5)*	Left rear of belt	Left rear belt	Right rear of belt (note 5).
Raincoat (slicker)	Same as for overcoat	Same as for overcoat	Same as for overcoat	Same as for overcoat	Same as for overcoat.
Rations, reserve, unconsumed part of one (note 4)	Off pommel pocket	Musette bag	Near pocket, saddlebags	Near pocket, saddlebags	Haversack.
Saddle, McClellan	Led horse	None	On mount	On each horse (part of harness)	None.
Saddle, officer's	On mount	None	None	None	None.
Saddlebags, pair	Cantle of McClellan saddle	None	On cantle or saddle	On cantle of saddle of off horse	None.
Set, toilet (note 2)	In cantle bag	In musette bag	In off pocket, saddlebags	In off pocket, saddlebags	Haversack.
Shirt, flannel	1 worn; 1 in bedding roll	1 worn; 1 in bedding roll	Worn	Worn	Worn.
Shoes, pair	1 worn; 1 in bedding roll	1 worn; 1 in bedding roll	1 worn; 1 in blanket roll	1 worn; 1 in blanket roll	1 worn; 1 in blanket roll.
Socks, light wool, pairs	1 worn; 1 in cantle bag; others in bedding roll	1 worn; 1 in musette bag; others in bedding roll	1 worn; 1 off pocket, saddlebags	1 worn; 1 off pocket, saddlebags	1 worn; 1 in haversack.
Surcingle (*on flap of pocket, saddlebags*)	1 in near pommel pocket; 1 on off flap	None	On flap, off pocket, saddlebags	On flap, each pocket, saddlebags	None.
Tags, identification, with tape	Around neck under shirt	Around neck under shirt	Around neck under shirt	*Around neck under shirt*	Around neck under shirt.
Tents, shelter half, pole and pins	In blanket roll	In blanket roll	In blanket roll	In blanket roll	In blanket roll.
Towel	1 in cantle bag; 2 in bedding roll	1 in musette bag; 2 in bedding roll	In off pocket, saddlebags	In off pocket, saddlebags	In haversack.
Undershirt	1 worn; 1 in cantle bag; 2 in bedding roll	1 worn; 1 in musette bag; 2 in bedding roll	1 worn; 1 in off pocket, saddlebags	1 worn; 1 in off pocket, saddlebags	1 worn; 1 in haversack.
Whistle (chain hooked left shoulder loop buttonhole)	In left pocket, shirt or coat	In left pocket, shirt or coat	In left pocket, shirt or coat	None	In left pocket, shirt or coat.

NOTES

1. The carrier is *worn suspended* over the other equipment as ordered at the time; contains tube of antidim. Carrier for animals is secured under jaw to halter.
2. The toilet set includes: Hairbrush (except for enlisted personnel); shaving brush and soap; razor; toothbrush, paste or powder; soap; comb; mirror; all wrapped in a towel.
3. Slung from right shoulder to left side.
4. A second reserve ration, *if carried, is distributed between both pockets of the* saddlebags to equalize weights.
5. Carried as indicated, when canteen is to be carried attached to left side of belt.

CHAPTER 3

FIELD EQUIPMENT

243. Allowances and disposition.—*a. Allowances.*—Tables of Basic Allowances prescribe allowances and constitute the bases for requisitions and issues.

b. Disposition.—The following table sets forth the disposition on the march of essential articles of field equipment.

244. Assembling and packing.—*a. Pistol belt.*—The belt having been assembled, articles of equipment attached to belt eyelets are worn in positions indicated in the above table.

b. Magazines and holsters.—The magazines are carried in the magazine pockets with base plates up, pocket flaps snapped. The holster for the Very pistol is worn on the belt in rear of the automatic pistol holster.

c. Canteen.—The canteen, with cup attached, is carried in the cover, concave surface toward the body, cover flaps fastened.

d. First-aid pouch and packet.—The pouch is attached to the belt back of the right hip in rear of pistol holster when the canteen cover is attached to the belt as prescribed for dismounted troops. The packet is carried in the pouch with ring down and toward the body, pouch flap fastened.

e. The haversack.—The haversack and pistol belt are assembled by inserting the hook of the rear suspender in the rear center eyelet of the belt, the left suspender hook in the second eyelet from the "loop" buckle, right suspender hook in the second eyelet from the "tongue" buckle, points of suspender hooks outward. To pack the haversack, spread out the haversack flaps and place in order from bottom to top, rations, toilet articles, and clothing. These contents are secured by folding first the inner flap and then the side flaps, and tightly buckling the binding straps. Fold down the outer flap and secure it with the straps provided, then insert the mess kit in the haversack pouch and buckle the flap strap. The assembled belt and haversack are put on by slipping the arms through the suspender loops. The length of the suspenders should be such as to permit the belt to rest over the hip bones and the top of the haversack to be on line with the top of the shoulders.

f. The overcoat and raincoat.—(1) *Long roll.*—The garments are rolled separately but alike. To make the long roll, fold the garment at its rear center seam or line, outside out and

collar extended, and roll tightly from the fold. The length of the roll is that of the garment. The roll is secured to the limber or caisson chest by the straps provided, or to the pommel of the saddle for mounted men. (See *l* below.)

(2) *Short roll.*—First form the overcoat into a rectangle approximately 42 inches by 52 inches. This is accomplished by spreading out the overcoat, inside up, sleeves turned wrong side out and extended parallel toward the bottom of the coat, collar spread out, slack gathered at the center seam and folded down on one side of the coat, front edges turned in toward the seam for about 12 inches. Next turn the tail back for about 9 inches to form a binding pocket and turn the collar side down for about 15 inches. The coat is then rolled tightly and smoothly from the collar side into the pocket. In a similar manner, the raincoat is formed into a rectangle about 9 by 11 inches, rolled and bound. The outside of each garment is outside when rolled.

g. Helmet.—When not worn, the helmet, in the case of mounted enlisted men, is attached to the off saddle pocket by securing the chin strap under the three flap straps of the saddle pocket; for other enlisted men the helmet is secured across the top of the haversack pouch.

h. Surcingle.—The surcingle is folded to a length equal to the width of the flap of a saddle-bag pocket, and is secured, buckle down, to the flap above the loops of the flap straps. The outer flap straps are passed through the surcingle folds, the center flap strap over the folds; flap straps are then run through their loops and buckled.

i. Grain and feed bags.—The filled grain bag, mouth securely closed by the string provided, is inserted mouth downward into the feed bag. A neat roll of the feed bag is then made by folding the unfilled portion against the filled portion and securely binding the roll with the feed-bag straps. A driver's two bags are secured end to end by binding their open ends together with their straps. Feed bags are secured to saddles as explained in *l* below.

j. The long blanket roll.—The shelter half is spread out with button side down, triangular portion to the front. Fold over the triangular portion, then fold the button edge under to a width of 8 inches. Fold the bed blanket once across its length and lay it on the shelter half, folded edge parallel to and one inch from the fold of the button edge of the shelter half. Using

the extended shelter half pole as a measure, place it on the blanket parallel to the button edge, centered over the middle line of the shelter half, and fold the shelter half and blanket over the ends of the pole. The pole is then removed and folded. Take position opposite to and facing the button edge fold of the shelter half. Lay the folded pole and pins, pole to the left, on the blanket, parallel and next to the bottom edge of the shelter half. The clothing and the mosquito bar having been evenly placed on the blanket, fold over the bottom edge of the shelter half with the blanket to secure the pole and the pins, and roll the whole tightly and evenly toward the button edge; the fold which was turned under is now brought back over the roll to bind it. The roll is then bound in three places, using the shelter-tent rope, approximately 12 inches from each end and at the center. The blanket roll should be about 44 inches long.

k. The short blanket roll.—(1) Lay the shelter half on the ground and fold over the triangular part.

(2) Hold the blanket up by two corners, the shorter edges vertical; bring the two corners together, thus folding the blanket in the middle; take the folded corner between the thumb and forefinger of the right hand, thumb pointing to the left; slip the left hand down the folded edge two-thirds of its length and seize it with the thumb and second finger; raise the hands to the height of the shoulder, the blanket extending between them; bring the hands together, the double fold falling outward; pass the folded corner from the right hand into the left hand, between the thumb and forefinger; slip the second finger of the right hand between the folds, seize the double folded corner; turn the left (disengaged) corner in, and seize it with the thumb and forefinger of the right hand, the second finger of the right hand stretching and evening the folds. The blanket is now folded in six thicknesses.

(3) Lay the folded blanket on the shelter half so that one of its shorter sides will be about 9 inches (12 for two blankets, 15 for three blankets) from the edge of the shelter half farthest from the triangular part. Place the underclothing on the blanket. Across the other short side of the blanket place the shelter-tent pole and pins.

(4) Fold over the sides and ends of the shelter half which lie outside of the blanket. Commencing at the end where the pole and pins are placed, roll the pack, using the hands and

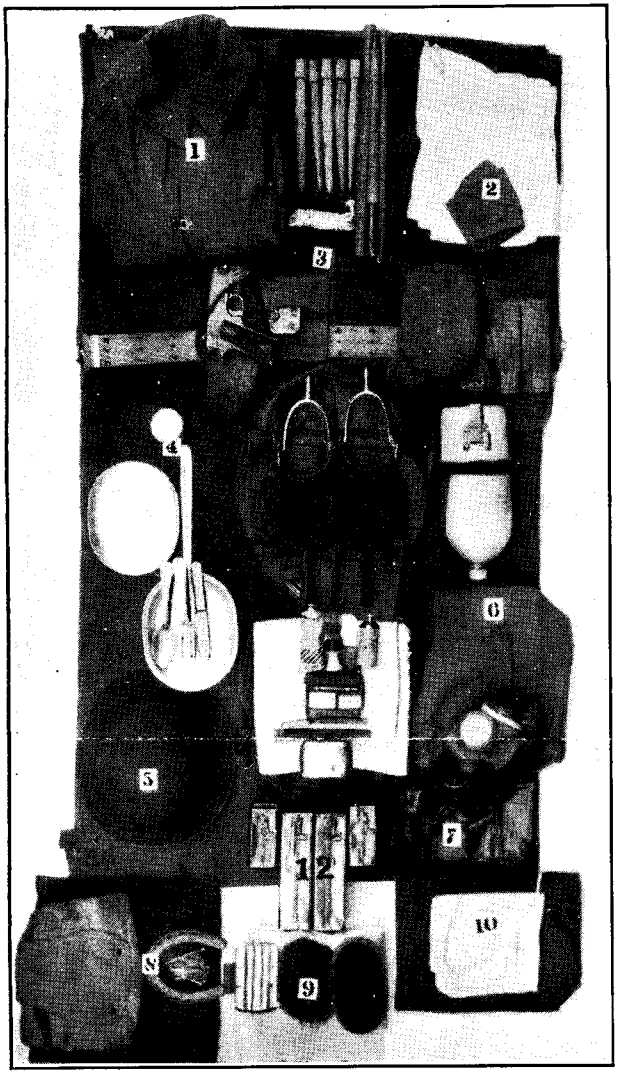
knees to insure the roll being made as tight as possible. Just before the roll is completed slightly open out the pocket formed by the 8-inch fold of the shelter half, and then draw the pocket over the roll, and bind it with the rope. Care should be taken to draw the canvas over the ends of the roll, so as to prevent rain and dust from entering the inner portion of the roll. The roll thus formed should be about 22 inches long.

(5) The roll is secured to the limber or caisson chest by means of the straps provided for the purpose. The rolls carried on any one limber chest are evenly disposed on either side of the door lock.

(6) Short rolls are used by motorized units.

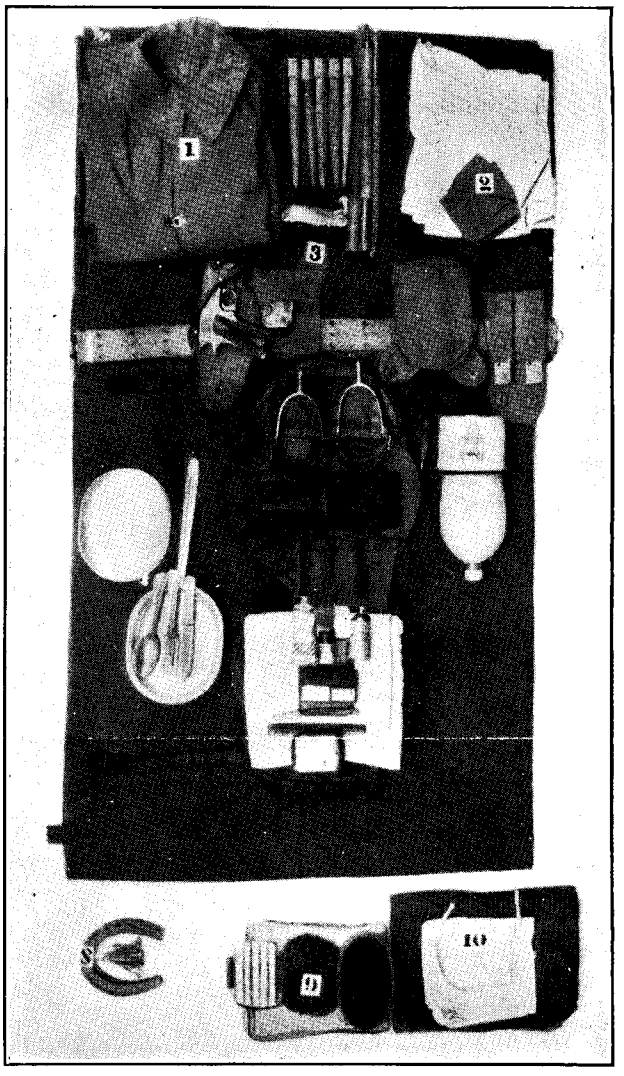
l. Securing rolls to saddles.—(1) *Drivers.*—The center of the long roll is laid across the buckle end of the cantle strap, the free end of the strap extended to the rear; the feed bags are symmetrically hung across the saddle seat in front of and against the roll. The free end of the cantle strap is carried forward over the roll and a tight turn taken completely around the junction of the bags. With the buckle end of the strap held up between the bags and the roll, the free end of the strap is passed under the roll and then carried forward over the roll, where it is buckled. Bags and roll are thus snugly bound together and tightly secured to the cantle. Each 60-inch coat strap is secured by its keeper to the ring of a saddle-bag pocket side strap above the strap, the ring not being twisted. The free end of each coat strap is passed forward under the adjacent quarter strap. A tight turn is taken with the coat strap completely around the feed bag, held close to the quarter strap; then a complete turn with the coat strap is taken tightly around the blanket roll about 6 inches from the end, the blanket roll and bag being drawn close together. The free end of the coat strap is then drawn forward tautly under the roll, up between the roll and the bag, and over the standing strap down to the buckle, where it is drawn tight and fastened. The standing part of the turns on the roll must be successively higher; the feed bag and the end of the roll must be close together. The open edge of the blanket roll is down.

(2) *Individually mounted men.*—The center of the long roll, with the roll slightly in front of the cantle, is secured by two tight turns of the center cantle strap, drawn taut and buckled. The roll is then turned to the rear of the cantle, open edge



1. War

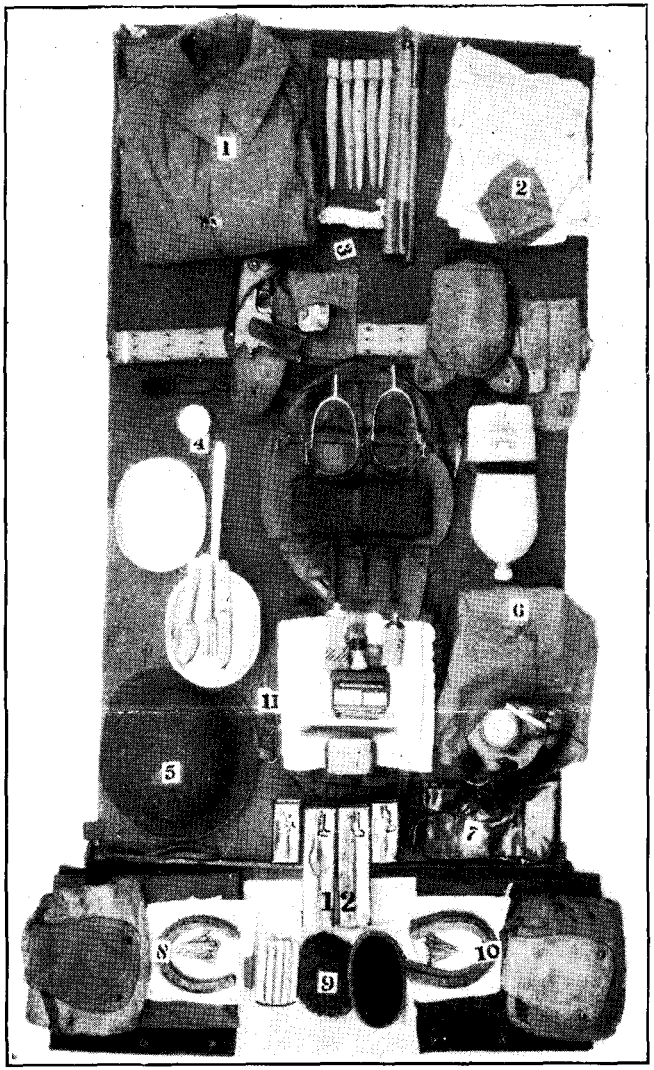
1. Raincoat (overcoat).
2. Undershirt, drawers, socks, handkerchief.
3. Blanket.
4. Dubbin.
5. Helmet.
6. Gas mask (carrier).
7. Gloves, protecting.
8. Horse mask, horseshoes, nails.
9. Grooming kit.
10. Feed bag, grain bag.
12. Cans, containing reserve rations.



2. Peace

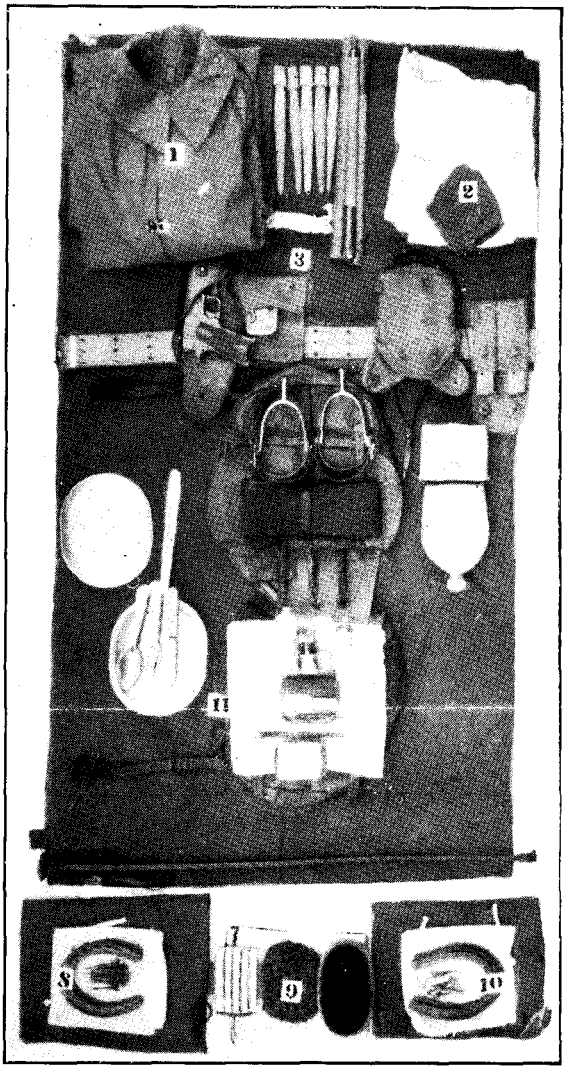
1. Raincoat (overcoat).
2. Undershirt, drawers, socks, handkerchief.
3. Blanket.
8. Horseshoes, nails.
9. Grooming kit.
10. Feed bag, grain bag.

FIGURE 32.—Equipment of individually mounted man



1. War

1. Raincoat (overcoat).
2. Undershirt, drawers, socks, handkerchief.
3. Blanket.
4. Dubbin.
5. Helmet.
6. Gas mask (carrier).
7. Gloves, protecting.
8. Horse mask, horseshoes, nails.
9. Grooming kit.
10. Feed bag, grain bag.
11. Surcingle, under the towel.
12. Cans, containing reserve rations.



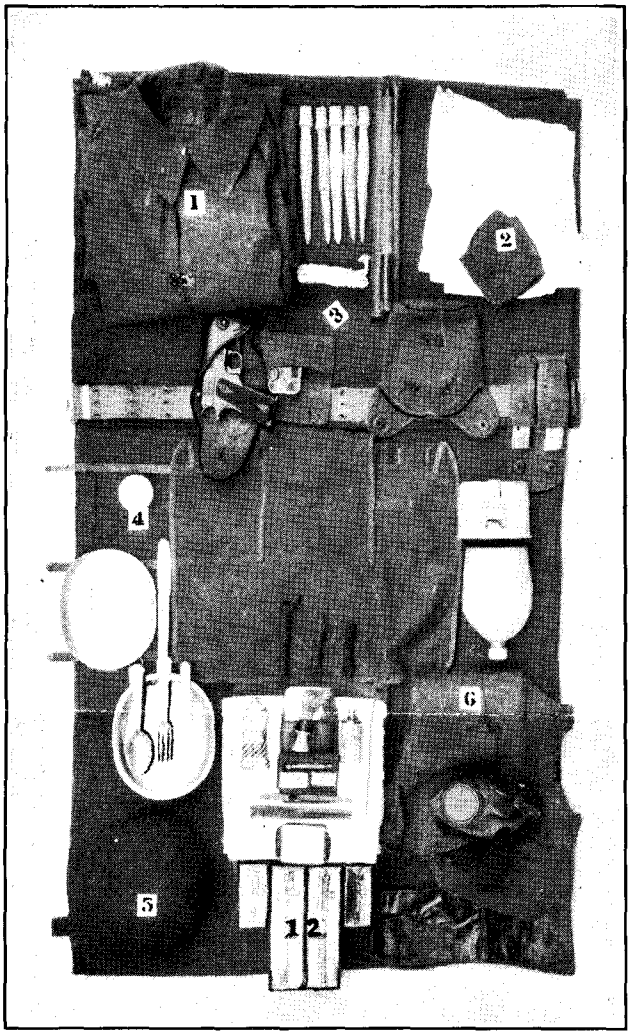
2. Peace

1. Raincoat (overcoat).
2. Undershirt, drawers, socks, handkerchief.
3. Blanket.

8, 10. Horseshoes, nails, feed and grain bags.

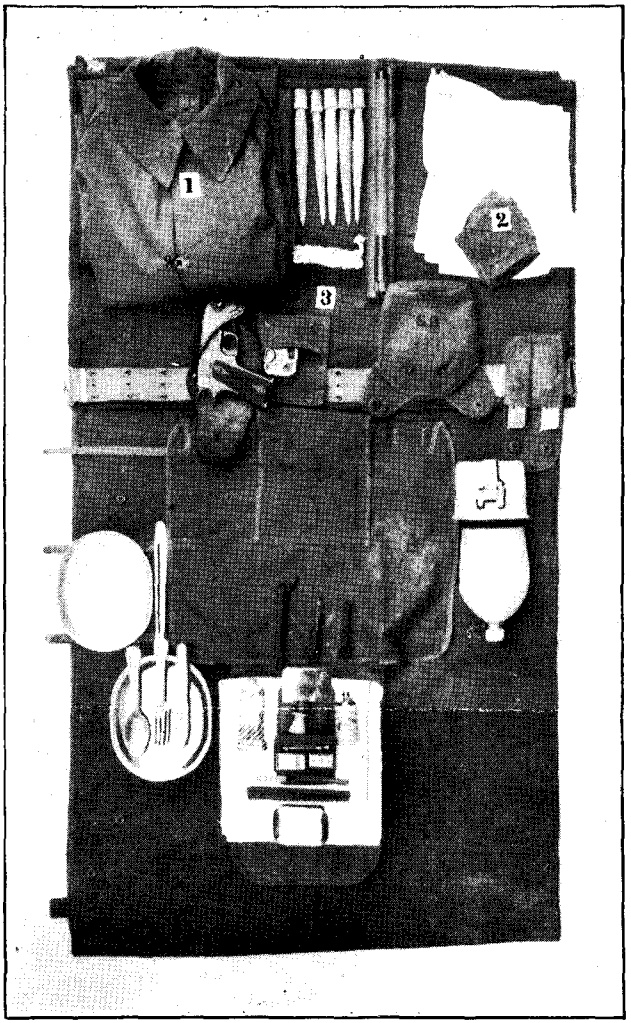
9. Grooming kit.
11. Surcingle, under towel.

FIGURE 33.—Equipment of mounted driver



1. War

1. Raincoat (overcoat).
2. Undershirt, drawers, socks, handkerchief.
3. Blanket.
4. Dubbin.
5. Helmet.
6. Gas mask (carrier).
12. Cans, containing reserve rations.



2. Peace

1. Raincoat (overcoat).
2. Undershirt, drawers, socks, handkerchief.
3. Blanket

FIGURE 34.—Equipment of enlisted men other than mounted

several turns of the 60-inch coat strap, the free end being down, but in such manner as to avoid touching rider or horse. Each end of the roll is drawn well forward and secured by passed under the last loop and then buckled. The 60-inch coat straps are attached to the saddle bags and quarter straps, as prescribed for the driver's roll. The feed bag is placed symmetrically on top of the roll. The bag and roll are secured together tightly by the side cantle straps, if issued, otherwise by the feed-bag straps. Straps and pack must be so adjusted as to cause no discomfort to the rider or the horse.

(3) *Overcoat and raincoat.*—The overcoat and raincoat long rolls are secured together on the pommel of the saddle of the individually mounted man by the three pommel straps provided. A driver's overcoat and raincoat long rolls are secured immediately behind the pommel of the off horse's saddle by the two pommel straps provided. In each case collars are to the left, the overcoat beneath the raincoat. Pommel straps are so adjusted that the buckles do not touch the animal and, for individually mounted men, are of no discomfort in riding.

245. Display of equipment for inspection.—Figures 32, 33, and 34 show, displayed for inspection, the war and peace equipment of individually mounted enlisted men, of mounted drivers, and of enlisted men other than mounted men, respectively.

CHAPTER 4

MOVEMENTS BY RAIL, WATER, AND TRUCK

246. Movements by rail.—*a. Basic principles.*—Principles pertaining to the composition of railway trains, time of travel, transportation groupings, assignments, order of entrainment, responsibilities of commanding officers and transportation officials, movement orders and entraining tables, and regulations governing the loading, transportation, and unloading of animals are prescribed in Basic Field Manual, Volumes V and VIII, and Staff Officers' Field Manual. The application of these principles to the division artillery is set forth in this manual. Standard trains of the types shown in the following tables are prescribed for the theater of operations.

Rail transportation, brigade and light regiment units, division artillery

(2 type A railroad trains, each consisting of 9 flat cars, 23 box cars, 1 passenger coach, 1 caboose (train crew only).)

Train No. 1 carries Brig Hq and Hq Btry (less Det), and the Hq, Hq Btry, Band, Serv Btry (less Dets), and Med attached (less Dets) of one light regiment.

LOAD PER FLAT CAR

1	Truck, 3-ton [a], truck, ¾-ton [a].
1	Car, omnibus [a], car, passenger, medium [a].
1	2 tractors [a], car, passenger, light [a].
1	Car, omnibus [b], car, passenger, light [b], mwsc [b]x.
1	Truck, ¾-ton [c], car, passenger, light [a], mwsc [b].
1	2 wagons, mountain [b], 1 wagon, mountain [d].
1	4 wagons, escort [c], 1 truck, light repair [a].
1	4 wagons, escort [c], 1 cart, ration and water [c].
1	3 wagons, escort [c], 1 cart, ration and water [b].

LOAD PER BOX CAR USED FOR VEHICLES

1	1 spring wagon [d], 2 reels and carts [a].
1	2 reels and carts [b], 1 mwsc [d], 2 mwsc [a].
1	1 wagon, escort [d], 1 kitchen, rolling [b].
1	1 wagon, escort [c], 1 kitchen, rolling [c].

Other loads—

	Brig Hq, Hq Btry	Light regiment			Box cars
		Hq, Hq Btry, Band	Serv Btry	Med Atchd	
Officers and warrant officers (in passenger coach)	7	12	3	3	
Enlisted personnel [e]	37	86	44	20	5
Animals	0	81	78	40	11
Rations, kitchen, baggage, forage					3

Train No. 2 carries a Det. of Brig Hq and Hq Btry, and the Hq, Hq Btry, Band Serv Btry (less Dets), and Med attached (less Dets) of one light regiment.

LOAD PER FLAT CAR

1	Truck, 3-ton [a], truck, ¾-ton [a].
1	Truck, 3-ton [a], car, passenger, light [a], mwsc [a]x.
1	Car, omnibus [a], car, passenger, light [a], mwsc [a].
1	Car, omnibus [b], car, passenger, light [b], mwsc [b].
1	Truck, ¾ ton [c], car, passenger, light [a], mwsc [b].
1	2 wagons, mountain [b], 1 wagon, mountain [d].
1	4 wagons, escort [c], 1 wagon, spring [d].
1	3 wagons, escort [c], 1 cart, ration and water [c].
1	3 wagons, escort [e], 1 cart, ration and water [b].

(See notes, p. 145.)

Rail transportation, brigade and light regiment units, division artillery—Continued

LOAD PER BOX CAR USED FOR VEHICLES

1	1 wagon, escort [d], 1 trailer, kitchen [a], 1 trailer, water [a].
1	2 reels and carts [b], 1 mwsc [d].
1	Wagon, escort [c], 1 kitchen, rolling [b].
1	Wagon, escort [c], 1 kitchen, rolling [c].

Other loads—

	Brig Hq, Hq Btry	Light regiment			Box cars
		Hq, Hq Btry, Band	Serv Btry	Med Atchd	
Officers and warrant officers (in passenger coach)	6	12	3	3	
Enlisted personnel *	37	86	44	20	5
Animals	0	81	78	40	11
Rations, kitchen, baggage, forage					3

[a] To Brig Hq, Hq Btry.
[b] To Regtl Hq, Hq Btry.
[c] To Regtl Serv Btry.
[d] To Med attached.
* Personnel in excess of accomodations of 5 box cars (180) ride in kitchen, forage, and vehicle cars.
(x) Motor cycle with side car.
Serv Btry vehicles disassembled as necessary.
Mwsc=Motor cycle with side car.

Rail transportation, a battalion of light division artillery

(3 type A railroad trains; each of a passenger coach, 23 box cars, 9 flat cars, 1 caboose (for train crew only) [a])

(*a*) *Matériel and vehicles*—

Number of flats per railroad train			Load on each flat car, and organization [b]
1st Tn	2d Tn	3d Tn	
3	3	3	1 gun, 2 caissons, 3 limbers (gun btry).
1	1	1	1 gun; 1 B & S wagon, 2 limbers, 1 btry reel (gun btry).
1	1	1	1 cart, r & w; 1 kitchen, rolling; 1 wagon, mountain; 1 btry reel (gun btry).
1	1		3 escort wagons (Serv Btry).
		1	3 escort wagons (Serv Btry); 1 limber (C Tn).
1			2 wagons, mountain (Hq Btry); 1 wagon, mountain (Med).
	1		1 cart, r & w, 1 kitchen, rolling (Hq Btry); 1 escort wagon; 1 mwsc [c] (Serv Btry).
		2	4 caissons, 4 limbers (C Tn).
1			1 escort wagon (Serv Btry); 2 reels and carts, 2 mwsc [c], (Hq Btry).
1	1		3 caissons, 4 limbers (C Tn).
	1		4 caissons, 2 limbers, 2 mwsc [c], (C Tn).
		1	B & S wagon, kitchen, rolling, wagon, mountain, cart, r & w (C Tn).

(See notes, p. 146.)

Rail transportation, a battalion of light division artillery—Con.

(*b*) *Personnel and animals*—

	Train No. 1			Train No. 2			Train No. 3		
	O	EM [d]	Animals	O	EM [d]	Animals	O	EM [d]	Animals
Bn Hq and Hq Btry	3	57	63	7	31	50			
Gun Btry	4	148	138	4	148	138	4	148	138
Combat train	0	24	28	1	43	44	2	81	93
Bn Sec Serv Btry	0	9	17	0	11	18	1	8	15
Med attached	1	7	6	1	4	2	1	5	6
Total	8	245	252	13	237	252	8	242	252

[a] Per train: 6 box cars for 216 enlisted, 14 box cars for 252 animals, 3 box cars for kitchen, rations, forage, baggage, and equipment; 1 passenger coach for officers and certain enlisted men.

[b] Service battery and combat train loads are knocked down as may be necessary.

[c] Mwsc=Motor cycle with side car.

[d] Excess of enlisted over 216 travel in passenger coach, forage, baggage, kitchen and flat cars.

Rail transportation, one regiment, 155-mm. howitzers

(One type B railroad train consisting of 1 passenger coach, 11 box and 17 flat cars, 1 caboose (for train crew))

NUMBER OF FLAT CARS AND LOADS PER FLAT CAR PER RAILROAD TRAIN

Each How Btry with det of Serv Btry [c]		Each Bn Hq, Hq Btry with dets of C Tn, Med [c]	
1	1 car, rec; 1 car, 5 passenger.	2	1 car, rec; 1 truck, ¾-ton.
4	1 tractor; 1 howitzer; 1 caisson.	1	1 tractor; reel and cart.
2	2 tractors; 2 caissons.	1	1 truck, 3 to 5 ton; 1 trailer, kitchen.
1	1 tractor; reel and cart.	1	1 truck, 3 to 5 ton; 1 trailer, water.
1	1 tractor; 1 trailer, MG.	2	1 car, 5-pass; 1 truck, 3 to 5 ton (C Tn).
4	1 truck, 3 to 5 ton; 1 tractor; 1 caisson.	4	1 mwsc [c]; 1 truck, 3 to 5 ton (C Tn).
1	1 trailer, kitchen; 1 truck, 3 to 5 ton, 1 mwsc [a] [b] (Serv Btry).	5	1 truck, 3 to 5 ton (C Tn).
1	1 trailer, water; 1 truck, 3 to 5 ton (Serv Btry).	1	1 ambulance, 1 truck, ¾-ton (Med).
1	1 truck, light repair; 1 truck, 3 to 5 ton (Serv Btry).		
1	1 truck, ¾-ton; 2 mwsc [a].		

OTHER CARS, NUMBER AND LOADS, PER RAILROAD TRAIN

	How Btry	Serv Btry	Total	Box cars	Hq, Hq Btry	C Tn	Med	Total	Box cars
Officers in passenger coach per train	4	1	5		8	1	1	10	
Enlisted	140	11	151	5	65	35	10	110	4
Kitchen; equip				4					3
Empty				2					4

Rail transportation, one regiment, 155-mm. howitzers—Continued

(One type B train for C Tn (less detachments) [c])

Flat cars and load per car		Other requirements
1	1 truck, 3 to 5 ton; 1 car, 5 passenger.	For the 2 officers, 80 enlisted men, the kitchen, rations, baggage and equipment, 1 passenger coach, and 4 box cars are required.
2	1 truck, 3 to 5 ton; 1 mwsc [a].	
1	1 truck, 3 to 5 ton; 1 trailer, kitchen.	
1	1 truck, 3 to 5 ton; 1 trailer, water.	
1	1 truck, 3 to 5 ton; 1 truck, light repair.	
11	1 truck, 3 to 5 ton.	

(One type B train for Regtl Hq, Hq Btry, Band, Serv Btry (less detachments) and Med attached)

Flat cars and load per car		Flat cars and load per car	
2	1 car, rec; 1 truck, ¾-ton.	1	1 car, rec; 1 truck, ¾-ton (Serv).
1	1 tractor, reel, cart; 1 mwsc [a] (Med).	1	1 truck, ¾-ton (Med); 2 mwsc [a].
2	1 car, 5-passenger; 1 truck, 3 to 5 ton (Serv).	1	1 truck, 3 to 5 ton; 1 car, 5 passenger.
1	1 truck, 3 to 5 ton, 1 car, 5 passenger (Serv).	1	1 truck, 3 to 5 ton (Serv); 1 car, 5 passenger (Med).
1	1 truck, 3 to 5 ton, 1 trailer, kitchen, 1 mwsc [a] (Serv).	1	1 truck, 3 to 5 ton: 1 trailer, kitchen.
1	1 truck, 3 to 5 ton; 1 truck, light repair (Serv).	1	1 truck, 3 to 5 ton (Serv); 1 truck, light repair.
1	1 truck, 3 to 5 ton; 1 trailer, water (Serv).	1	1 truck, 3 to 5 ton; 1 trailer, water.
1	1 truck, 3 to 5 ton (Serv); 2 mwsc. [a]		

(For officers, warrant officer, enlisted men, the kitchen, rations, baggage and equipment are required 1 passenger coach and 8 box cars)

	Regtl Hq, Hq Btry, Band	Serv Btry	Med attached
Officers and warrant officers (chaplain included)	14	2	3
Enlisted personnel	113	39	10

13 railroad trains per regiment (1 per How Btry, 1 per Bn Hq, Hq Btry, and dets, 1 per C Tn (less dets), 1 for Regtl Hq, Hq Btry, Band, Serv Btry (less dets), Med attached.

[a] Mwsc=Motorcycle with side car.
[b] With only 1 How Btry per battalion.
[c] If capacity of each box car permits transport of heavy trucks, 3 type B trains would be adequate for the transport of a battalion.

Rail transportation, ammunition train, division artillery

(3 type B railroad trains, each of 17 flats, 11 box, 1 passenger coach, 1 caboose (train crew only))

Train No. 1, flat cars and load per flat car		Train No. 2, flat cars and load per flat car		Train No. 3, flat cars and load per flat car	
10	1 truck, 3-ton, 1 escort wagon, 1 mwsc.	2	1 truck, 3-ton, 1 escort wagon, 1 mwsc.	3	1 truck, 3-ton, 1 escort wagon, 1 mwsc.
1	1 truck, 3-ton, 1 truck, light repair.	10	1 truck, 3-ton, 1 escort wagon.	3	1 truck, 3-ton, 1 escort wagon.
2	1 truck, 3-ton, 1 car, motor, light.	1	1 truck, 3-ton, 1 car, motor, light.	1	1 truck, 3-ton, 1 truck, light repair.
2	1 truck, 3-ton, 1 trailer, kitchen.	1	1 truck, 3-ton, 1 ambulance.	10	2 trucks, 3-ton (knocked down as necessary).
2	1 truck, 3-ton, 1 trailer, water.	1	1 truck, 3-ton, 1 truck, ¾-ton.		
		1	1 truck, 3-ton, 1 trailer, kitchen.		
		1	1 truck, 3-ton, 1 trailer, water.		

Vehicles knocked down as required	Train No. 1				Train No. 2					Train No. 3		
	Am Tn Hq	Btry A (truck)	Btry C (wagon)	Box cars	Btry A (truck)	Btry B (truck)	Btry C (wagon)	Med attd	Box cars	Btry B (truck)	Btry C (wagon)	Box cars
Officers (in passenger coach)	3	2	1		1	1	1	1		2	1	
Enlisted men	56	82	39	5	36	12	46	9	4	106	31	4
Animals			54	3			54		3		39	3
Kitchen, baggage, forage				3					4			3
Ambulance								1				
Cars, motor, light	1	1				1						
Kitchen, rolling											1	1
Motor cycles, with side car	5	4	1			2				3		
Trucks, 3-ton	3	14			15	2				27		
Trucks, ¾-ton								1				
Trucks, light repair		1								1		
Trailer, kitchen	1	1				1						
Trailer, water	1	1				1						
Wagons, escort			10				12				6	

b. Warning order.—Troops should be advised of pending rail movements 48 hours in advance, to provide time for turning in property, securing clearances, and completing other essential preparations. The commanding officer of troops should notify the transportation service of the number and class of personnel, animals, vehicles, baggage, and equipment that are to be moved by rail, and of the forage, rations, and other supplies required.

c. Transportation groupings.—Except for the ammunition train, the basic units for railway transportation of the division artillery are the gun or howitzer battery and the regimental headquarters battery. Unit railway-train accommodations in excess of a battery's requirements are filled by detachments from other division artillery units and medical troops; such detachments should be adequate for the handling of the impedimenta and animals accompanying them. This rule also applies to subdivisions of a gun or howitzer battery detached by reason of being in excess of train accommodations. (See tables in *a* above.)

d. Organization.—Entrainment should be such as will expedite detrainment and tactical employment. To this end, for example, a piece and its caissons, carriages with their tractor, a reel and cart, etc., should be grouped on the same flat car; animals of a section should be together; personnel should be grouped by sections. Commanding officers of transportation groupings submit to their superiors for appropriate action plans for entrainment and detrainment. Plans vary with the variation in loading facilities, number of entraining points, types of matériel, tractive power, and railway cars. The plan outlined in the following table exemplifies an entrainment organization appropriate for division light artillery.

Organization for entraining one-third of a battalion of division light artillery

BATTERY COMMANDER

	Group I (vehicles)	Group II (animals)
In charge	1 officer	1 officer.
Assistants	Chief mechanic	Stable sergeant.
Property security	Detachment of the guard	Detachment of the guard.
Loading detail	Carpenter; detail of enlisted personnel, not mounted.	Horseshoers; stable orderlies; mounted enlisted; teamsters.

Organization for entraining one-third of a battalion of division light artillery—Continued

BATTERY COMMANDER—Continued

	Group III (baggage)	Group IV (personnel)
In charge	1 officer	1 officer.
Assistants	Supply and mess sergeants	First sergeant.
Property security	Detachment of the guard	Guard (less detachments).
Loading detail	Cooks; saddler; other mechanics; detail of other enlisted not mounted; personnel released from Groups I and II.	Battery clerks; personnel not required by other groups; personnel released from Group III.

e. Entrainment.—(1) The organization in the table in *d* above functions in the following manner: The unit and detachments from other organizations that are to travel in the same train are inspected and, when found to be ready to entrain, are marched, Group III detached, to the vehicle cars. Group III is dispatched to the entraining point independently, where the preparation of the kitchen car and the loading of rations, forage, and baggage are methodically and promptly accomplished.

(2) Overcoats, raincoats, canteens, saddle bags (grain bags inside), saddle pockets, haversacks, musette bags, side arms, and special individual equipment are taken into personnel cars by individuals. Blanket rolls, bedding rolls, and carriage accessories are loaded with other baggage. If troops are transported in box cars they retain their blanket rolls. Harness, saddlery, watering buckets, and feed bags are loaded in the forage car. Until required for loading, the foregoing articles are piled on the ground and left under guard.

(3) At the vehicle cars nonmounted men pack unsecured accessories in paulins, remove personal equipment, and pass watering buckets to drivers. Vehicles are spotted at the loading ramps by teams as called for, teams being unhitched and moved to the harness car in turn. Vehicles are pushed aboard and securely chocked in place by Group I personnel. Its task completed, this personnel, carrying its equipment and carriage accessories, is reported to the Group III officer, who causes it to load its blanket rolls and carriage accessories, and then releases it with its individual equipment to the Group IV officer.

(4) Mounted men remove their equipment from the saddles and pack the harness and saddlery in sacks at the harness car. Leaving these articles and the watering buckets in piles, the

mounted men lead their animals by team or section to the horse cars. The Group II officer releases the personnel of his group, after loading the animals, to Group III for the loading of saddlery, harness, watering buckets, feed bags, forage, and other impedimenta; it is then released, with individual equipment, to Group IV.

(5) The Group III officer releases cargo vehicles to Group I for loading, after the discharge of their last cargo, including accessories and teamsters' blanket rolls.

(6) The Group IV officer segregates personnel in detachments, each equal in number to the accommodations of the assigned car; each detachment consists of as many whole sections as practicable under the command of the senior chief of section. Detachments are loaded simultaneously shortly before the train departs.

(7) Railway cars are inspected by the battery commander and the group leaders sufficiently in advance of the arrival of the command so that the cars found unsuitable may be made ready for use before the hour of entraining.

f. Detrainment.—Personnel vacates cars; horse equipment, bedding rolls, accessories are unloaded; animals are detrained in the reverse order of loading; teams are harnessed, and mounted equipment packed; teams are then moved to the vehicle cars. Vehicles are unchocked and unloaded in the reverse order of loading, and teams hitched. Cargo vehicles as hitched are moved to Group III cars and loaded. A place of assembly is selected near detraining points at such distance away as will obviate congestion. Each vehicle and artillery carriage is moved to the assembly point as soon as loaded and equipped. When the command is detrained and assembled, report is made to proper authority.

g. Other requirements.—(1) The manhandling of carriages should be avoided by the use of teams or tractors. At least two ramps should be available for loading vehicles and two for loading horses. Sleeping cars should be provided for journeys in excess of 48 hours. Box cars, when used for personnel and animals, must be modified to provide for ventilation.

(2) Flat cars should not be less than 38 feet long. Box cars not smaller than the type used commercially for automobile shipments are desirable for motorized artillery. Disassembling for loading is limited, if possible, to vehicles and carriages of trains and service batteries. Troops provide in advance the ma-

terial required for securing vehicles, artillery carriages, and matériel to railroad cars. The chocking and lashing of rubber-tired vehicles and carriages must be sufficient to offset excess movement during train travel due to the resiliency of the rubber tires. Drop-end gondolas provide the security desired.

(3) Entrainment and detrainment constitute a part of artillery training.

h. Other than type trains.—Nontype trains may be employed outside of the theater of operations and will generally be used in time of peace. Sizes of cars required and compositions of trains may be determined from the table below in conjunction with "Railway Equipment Register," a monthly publication, obtainable through post quartermasters. From the information thus obtainable appropriate loadings may be arranged prior to arrival of trains.

Railway car space requirements; dimensions artillery vehicles

(Dimensions, artillery vehicles; last dimension is the height)

Car, touring; Dodge	5′9″ x 14′2″ x 6′1″.
Car, sedan, Chevrolet	5′5″ x 12′8″ x 6′2″.
Car, reconnaissance, White	5′10″ x 18′6″ x 7′8″.
Motor cycle with side car	6′8″ x 7′6″ x 3′9″.
Truck, cargo, Militor, A body	5′9″ x 18′9″ x 10′2″.
Truck, cargo, Militor, B body	7′2″ x 18′11″ x 9′11″.
Truck, cargo, F. W. D., A body	5′9″ x 18′ x 9′8″.
Truck, cargo, F. W. D., B body	7′2″ x 18′11″ x 9′10″.
Truck, F. W. D.: ammunition body	6′10″ x 17′9″ x 6′.
Truck, Liberty, gasoline	8′ x 24′ x 8′.
Truck, ¾-ton, AA body	5′8″ x 17′1″ x 8′.
Truck, light repair	5′5″ x 13′2″ x 6′10″.
Truck, radio, White	7′ x 21′ x 9′.
Ambulance	6′2″ x 16′5″ x 8′.
Trailer, kitchen	6′7″ x 5′ x 15′4″.
Trailer, water	5′9″ x 13′5″ x 5′10″.
Trailer, machine gun	7′ x 14′ x 9′.
Trailer, 3-inch field gun with long load 240 mm. howitzer	7′8″ x 19′ x 5′6″.
Trailer, reel M1909, M1	6′7″ x 11′ x 5′5″.
Cart, instrument, for reel	6′5″ x 10′10″ x 6′2″.
Tractor, 5-ton	6′ x 11′ x 6′.
Tractor, 10-ton	7′6″ x 14′10″ x 8′.
Caisson, 155-mm. howitzer, with pole	7′ x 9′ x 6′.
Caisson, 155-mm. howitzer, without pole	7′ x 5′ x 6′.
155-mm. howitzer, limbered	7′ x 26′ x 7′.
155-mm. gun, limbered	9′ x 29′ x 6′6″.
240-mm. howitzer on transport wagon, limbered	6′10″ x 27′2″ x 6′4″.
240-mm. howitzer cradle, on transport wagon, limbered	6′10″ x 23′ x 5′10″.
240-mm. howitzer top carriage, on transport wagon, limbered	6′10″ x 24′ x 8′11″.
240-mm. howitzer platform, on transport wagon, limbered	9′2″ x 25′2″ x 6′10″.

247. Movements by water.—*a. Regulations governing.*—Army Regulations prescribe the rules governing embarkation, preliminary preparations, routine duties on board ship, debarkation, and the secrecy to be observed with respect to oversea movements.

b. Embarkation characteristics.—Field Artillery will be embarked so as to expedite its tactical employment when such is expected upon debarkation. The battalion ordinarily constitutes the embarkation unit; in any event a gun or howitzer battery will be accompanied on the same transport by its impedimenta, and by animals when feasible. Pieces, ammunition, ammunition vehicles, supplies, and tractors will be stowed on board in the reverse order of debarkation, thus conforming to the sequence of tactical requirements. When tactical deployment upon debarkation is not contemplated, embarkation may be such as will assure economical ship loading; to this end personnel is not necessarily accompanied by its animals or impedimenta.

c. Motorized artillery.—Motorized artillery, as compared with horse-drawn artillery, is more suitable for unit loading, more economical in space, and more readily put ashore.

d. Animals.—Depending upon available facilities, animals may be embarked by being led up gangplanks or by being hoisted aboard. Animals may be similarly debarked or they may be required to swim ashore; as many as practicable should be led from small boats while swimming.

e. Debarkation functions.—In landings on hostile shores, the debarkation of artillery impedimenta and animals on the beach is the function of field artillery personnel; the operation of all ship appliances, including small boats and launches, is the duty of ship personnel. Coordinated plans for the employment of personnel will be prepared by the commanders concerned.

f. Training.—In addition to instruction in embarkation and debarkation, other phases of training to be stressed while at sea include physical exercises; transport regulations; instruction in the characteristics of the hostile people, their armed forces, and country; instruction in the capabilities and operation of the battery's matériel; simulated fire control and adjustment; drill with antiaircraft weapons; the care of animals on shipboard.

g. Cargo space.—To aid in preparing reports as to cargo space required, the rule that a cubic foot of cargo is equivalent to 0.025 ship ton should be applied; for example, allowing 300 cubic feet for an animal of average size and applying the rule indicates that 7.5 ship tons are required per animal.

248. Movements by truck.—*a. Basic principles.*—This paragraph covers the application to the Field Artillery of the prin-

ciples prescribed in other regulations governing the movement of troops of all arms by motor transport.

b. Transport characteristics.—Motor transport constitutes a troop carrier analogous to a railway train. Motor transport is not under the command of commanders of troops transported. Motor transport operates on a prescribed schedule along prescribed routes which the commanders of troops transported will not alter except in grave tactical necessity. Motor transport personnel has no function with respect to troops and cargo transported other than that of transport and assistance in entrucking and detrucking.

c. Field artillery elements transported.—Field Artillery normally moves by its organic traction instead of motor transport. When motor transport is necessary it is usually used for light or horse artillery only. All elements of the light and horse artillery, except trucks and passenger cars, and in certain situations animals, may be moved by motor transport. The decision as to what elements shall move by motor transport rests with the officer ordering the movement. Carriages will not be towed at rapid rates, nor for long distances, unless especially designed for such movements.

d. Cargo requirements.—(1) A 3-ton truck is adequate for a light piece and caisson, or two caissons, or a caisson and limber, or three horses with equipment and harness, or a 3-ton tractor; a 5-ton truck can carry a 5-ton tractor or a 155-mm. howitzer and limber, or its two caissons. Animals should be transported with their heads to the front.

(2) Tractors are accompanied by the driver and assistant driver; three horses, by four men; caisson loads, by eight men; piece loads, by four men. This personnel with its equipment is in addition to motor-truck personnel.

e. Entrucking and detrucking.—Ramps and extension pieces for animal trucks are provided by the motor transport command. Prior to the arrival of the convoy, matériel and animals to be entrucked should be formed at entrucking points with intervals appropriate for expeditious entrucking. Batteries should be at one side of the traffic route, carriages unlimbered, horses unhitched and unharnessed. Loading begins promptly and proceeds simultaneously for all trucks. A Field Artillery officer should accompany parties dispatched in advance to select detrucking points. Their location should be such as will avoid

the artillery's having to cross the main traffic route after detrucking. Upon being unloaded, matériel and animals are moved off the road, animals harnessed and watered, and then hitched. Carriages are limbered, equipment secured, and the battery closed up and moved to its destination. Detrucking points should provide room for the foregoing operations. In tractor-drawn artillery, tractors should be used for pushing carriages into trucks and pulling them therefrom. Ramps must be strong enough for this purpose. Training programs should prescribe practice in entrucking and detrucking, simulated if trucks are not available.

f. Coordination.—The Field Artillery commander, when called upon, recommends to his commanding officer entrucking and detrucking points, and submits a table regulating entrucking and enumerating the elements of his command to be transported by trucks, the number of trucks required, the allocation of units to entrucking points, the hour each element begins entrucking, the destination of the initial point on the traffic route, and the hour at which each element will clear the initial point.

PART FIVE

CEREMONIES

CHAPTER 1

MOUNTED CEREMONIES

249. General.—*a.* At formations for ceremonies in which field artillery organizations of different types take part, the organizations are formed in order from right to left in line, and from head to rear in column, as follows: Horse artillery; horse-drawn artillery; pack artillery; portée artillery; tractor-drawn artillery; light, medium, heavy.

b. At ceremonies the pieces are in front unless the formation is in double section.

c. Enlisted men mounted on chests fold their arms while at the halt and walk; at the trot and gallop they hold to the side rails or straps. Those in motor vehicles fold their arms if seated, otherwise they hold on.

d. Horse-drawn artillery passes in review at a walk and at faster gaits when ordered. When passing at gaits other than

the walk, no salutes are made except by the commander of the troops when he leaves the reviewing officer.

e. Officers in motor vehicles salute with the hand.

f. The reviewing officer returns the salute of the commanding officer of the troops and the salutes of subordinate commanding officers down to include battalion commanders; those who accompany the reviewing officer do not salute.

g. When accompanying reviewing or inspecting officers, commanders of troops take posts on the right.

250. Reviews. — *a. Battalion.* — (1) The battalion being formed, the battalion commander faces to the front, his staff taking post to his rear. In tractor-drawn battalions, the battalion commander and his staff are dismounted, their vehicles being formed to their left rear. The reviewing officer moves a few yards toward the battalion commander and halts; the latter turns about, commands: 1. ***Present,*** 2. ***SABERS,*** and again turns about and salutes the reviewing officer.

(2) The reviewing officer returns the salute; the battalion commander turns about, commands: 1. ***Carry,*** 2. ***SABER,*** and again turns to the front.

(3) The reviewing officer approaches to within about 6 yards of the battalion commander; the latter salutes, returns saber, joins the reviewing officer, takes post on his right, and accompanies him around the battalion.

(4) In motorized battalions, the battalion commander may remain in place or he may mount in his car to accompany the reviewing officer, as the latter may direct. The reviewing officer proceeds to the right of the band, passes along the front to the left of the line, and returns to the right, passing in rear of the line. The reviewing officer and those accompanying him salute the standard when passing in front of it.

(5) While the reviewing officer is passing around the battalion the band plays, ceasing when he leaves the right to return to his post.

(6) Having returned to the right of the line, the battalion commander salutes, halts, and, when the reviewing officer and staff have left, moves directly to his post in front of the battalion, faces it, draws saber, and commands: 1. ***By the right flank,*** 2. ***MARCH,*** 3. ***Battalion,*** 4. ***HALT.*** The command ***Halt*** is given as soon as the carriages have completed the turn. The band takes post 36 yards in front of the leading battery.

(7) The column being formed, the battalion commander commands: 1. ***Pass in review,*** 2. ***Forward,*** 3. ***MARCH,*** 4. ***GUIDE RIGHT.*** At the command ***March*** the column marches off, the band playing. In motorized battalions the battalion commander and his staff mount after the commands for passing in review are given. Without command from the battalion commander the column changes direction at the points indicated, so as to pass in review in column of batteries at full distances with guide to the right. The battalion commander takes his post 30 yards in front of the band, immediately after the second change in direction. The band, having passed the reviewing officer, turns to the left out of the column, takes post in front of and facing the reviewing officer, and remains there until the review terminates.

(8) When the battalion commander is 6 yards from the reviewing officer he and his staff salute, turning the head and eyes sharply to the right. When the battalion commander has passed 6 yards beyond the reviewing officer the battalion commander and his staff resume the carry or drop the hand, turning the head and eyes to the front.

(9) The other officers, noncommissioned staff officers, the drum major, and noncommissioned officers commanding platoons salute as prescribed for the battalion commander.

(10) The reviewing officer returns the salute of the battalion commander only and salutes the standard.

(11) The battalion commander, after saluting, takes post on the right of the reviewing officer, and the staff on the right of the reviewing officer's staff. In motorized units the battalion commander and his staff dismount and sabers are not drawn; in other units the battalion commander and his staff dismount if the reviewing officer is dismounted, and in this event sabers are returned. The battalion commander remains with the reviewing officer until the rear of the battalion has passed, then, without changing position, salutes with the hand if sabers have been returned, otherwise with the saber, and, accompanied by his staff, rejoins the battalion. The band ceases to play when the battalion has completed its first change of direction after passing the reviewing officer.

(12) When sufficient space is available, the leading battery executes by the right flank after passing at least 100 yards beyond the reviewing officer and then proceeds by appropriate changes in direction to the ground originally occupied, increas-

ing the gait as necessary to prevent blocking batteries in rear. The other batteries execute the same movements successively on the same ground. When space is restricted, the battalion commander gives the necessary orders for the changes of direction after passing the reviewing officer.

(13) For motorized and pack artillery battalions the review terminates when the rear element has passed the reviewing officer; the band then ceases to play and rejoins the battalion or is dismissed. In horse and horse-drawn battalions, when the battalion arrives in column on the ground originally occupied, the battalion commander, if so directed, gives commands for passing in review at an increased gait.

(14) The above is the normal method of passing in review, but the battalion may pass in column of batteries at closed interval, in double section column or flank column, or in any suitable formation the reviewing officer may direct.

b. Regimental.—(1) The regiment may be formed in line with full or closed intervals, in line of masses, or in such other formation as may be prescribed.

(2) When the formation is in line with full intervals, the review is conducted in a manner similar to that prescribed for the battalion.

(3) In riding around the regiment, the reviewing officer passes in rear of the line of battalion commanders to the left of the line and returns in rear of the line of carriages to the right.

(4) At the second change of direction when passing in review each battalion commander takes post 30 yards in front of the leading battery commander. When closed in mass this distance is suitably reduced.

(5) When in any other formation the review is conducted according to the same principles, each battery being placed in march in time to follow the preceding one at the proper distance.

c. Brigade.—(1) The brigade is formed and prepared for review as explained for the regiment. The brigade commander and staff take post 30 yards in front of the line of regimental commanders when in line; 30 yards in front of the leading regimental commander when in column.

(2) The review is conducted according to the principles laid down for regimental review, the brigade commander taking post

30 yards in front of the leading regimental commander when about 100 yards from the reviewing officer.

251. Inspections.—The inspections herein prescribed partake in part of the nature of ceremonies. Such inspections do not in any sense replace the detailed inspections which organization and other commanders should make of materiel and equipment. If the battery commander (in horse-drawn units) dismounts to make the inspection, the chiefs of platoon and section immediately dismount and turn over their horses.

a. Gun or howitzer battery (fig. 35).—(1) The battery being in double section line, the battery commander commands: 1. ***Prepare for inspection,*** 2. ***ACTION FRONT.***

(*a*) At the second command, the first and second platoons are unlimbered or uncoupled and prepared for firing. The instruments and equipment of the detail are displayed for inspection. The chief of the third platoon (5th and maintenance sections) moves his platoon to the rear by a left about, and, after gaining sufficient distance, executes a second left about and forms the platoon in double section line abreast of the limbers or tractors of the piece sections. The horsed elements and led horses, or motor vehicles and carriages, of the detail form on this same line, in rear of the instruments.

(*b*) The chiefs of the first and second platoons take post opposite the center of their platoons, 4 yards in front of the line of muzzles. The chief of the detail (reconnaissance officer if present) takes post on this line, opposite the center of the detail. The chief of the third platoon takes post opposite the center of the platoon, 4 yards in front of the line of lead drivers.

(*c*) In a mounted detail, the vehicle drivers, the signal corporal with the reels, and the chief of section (instrument sergeant) remain mounted. All others form in double rank behind the displayed instruments and equipment except three orderlies holding the led horses and two linemen remaining with the reels. In a motorized detail the formation is in general similar.

(*d*) Batteries of heavy artillery are not ordinarily uncoupled and prepared for action at formal inspections. The command ***Action front*** is omitted.

(*e*) In batteries of 155-mm. howitzers, at the command ***Prepare for inspection,*** sections move out, incline to the right, execute a left about, and halt so that the muzzles of the pieces are on the line formerly occupied by the fronts of the tractors.

The battery commander then commands: ***ACTION REAR,*** at which command elements are posted as indicated above.

(2) All the carriages being in position, the battery commander commands: 1. ***Right,*** 2. ***DRESS,*** verifies the alignment of the officers and the two ranks of carriages, commands: ***FRONT,*** and posts himself, when not acting as inspector, opposite the center of the battery and 8 yards in front of the line of muzzles.

(3) In motorized batteries all officers and enlisted men mounted in motor vehicles dismount and stand opposite their seats 2 feet outside the wheels and on the side on which they were seated. Where three men are on one seat, the center man takes post 2 feet in rear of the man who was seated on his right. In horse-drawn batteries the guidon is 4 yards from the right flank of the line of limbers abreast of the lead drivers, the buglers on the right of the guidon, all three boot to boot. In motorized batteries the guidon and buglers are similarly posted with respect to the line of tractors. The chiefs of section cause all limber, caisson, wagon, and toll chests to be opened for inspection and tool kits to be displayed. In light and medium artillery gunners' tool kits are opened and laid out on the trails of the pieces.

(4) When acting as inspector, the battery commander inspects the reconnaissance officer and chiefs of platoon from right to left, and then the first sergeant; he then moves to the right flank of the limbers, where he returns saber and inspects the guidon and buglers. Followed by a bugler (in horse-drawn units), he then moves to the right flank of the battery, where, in case he desires to inspect dismounted, he dismounts and turns over his horse. He then inspects the detail and sections in order from right to left. The detail is inspected in the order: Chief of section, instruments and equipment, horsed elements, or motor vehicles. Each piece section is inspected in the order: Chief of section, piece and caisson, limbers or tractors. The fifth and maintenance sections are then inspected, commencing in each case with the chief of section. The above procedure may be varied at the discretion of the inspecting officer. When the battery commander commences the inspection of the right platoon, the chiefs of the other platoons cause their platoons to stand at ease, calling them to attention as the battery commander approaches. Each chief of platoon accom-

panies the battery commander during the inspection of his platoon. As soon as a platoon is inspected, its commander causes it to take the march order and then to stand at ease. The platoon commander faces his platoon while it is at ease.

(5) The inspection being completed, the battery commander causes the battery to limber, mounts the cannoneers, and commands: 1. ***Form double section line,*** 2. ***MARCH.*** Horse-drawn batteries are limbered front and rear, and the first and second platoons form double section line as prescribed in paragraph 218. Tractor-drawn batteries are limbered rear, and, after limbering, each piece section, at the command of its chief, inclines to the right, executes a left about, and is established on line with the front of the piece tractor where the muzzle of the piece had been. The chiefs of the other platoons (horse drawn or tractor drawn) move their platoons in double section up on the line.

(6) Should the inspector be other than the battery commander, the latter, having prepared his battery for inspection and taken his post, salutes when the inspector arrives in front of him. The inspector returns the salute and inspects the battery commander. The latter, having been inspected, returns saber and accompanies the inspector during the inspection of the battery.

b. Headquarters battery, service battery, combat train.—The inspection is conducted in general as described above for a gun or howitzer battery. Headquarters batteries and horse-drawn combat trains are formed in double section line, headquarters instruments and equipment being displayed 13 yards to the right of the line. Service batteries and motorized combat trains form in line. The command ***Action front*** is omitted.

c. Battalion.—(1) The battalion being in column of batteries in double section line, on the approach of the inspector the battalion commander commands: ***PREPARE FOR INSPECTION.***

(2) The batteries are prepared for inspection as prescribed above.

(3) The buglers join their batteries. The drum major conducts the band, if there be one, to the rear of the column, passing by the right flank, and places it, facing to the front, so as to be 36 yards in rear of the last battery and opens ranks.

(4) The standard moves to the front and takes post 6 yards in rear of the center of the line of the noncommissioned staff.

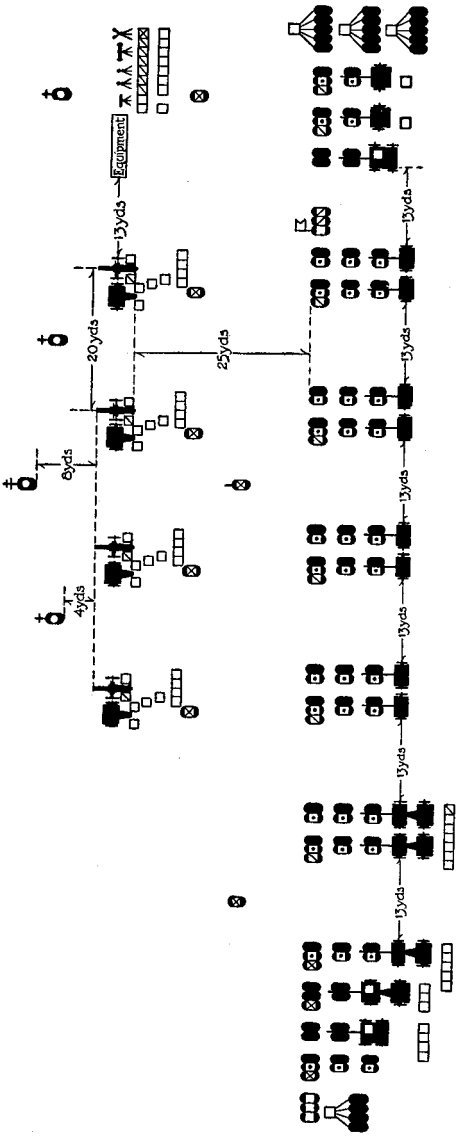


FIGURE 35.—Battery inspection, mounted, 75-mm. gun, horse-drawn

(5) The inspector inspects the battalion commander and, accompanied by the latter, inspects the staff. The battalion commander and his staff, as soon as inspected, return saber, and accompany the inspector.

(6) The inspector, commencing at the head of the column, inspects the standard, the batteries in their order in column, and the band. The standard may be dismissed as soon as inspected.

(7) The battery commander of each battery not undergoing inspection dismounts drivers and brings the men to rest. As the inspector approaches the battery, the battery commander brings it to attention and mounts the drivers. As soon as he himself has been inspected, he returns saber and accompanies the inspector. The inspector proceeds as in battery inspection. At its completion, the battery commander limbers, forms double section line to the front, dismounts drivers, and brings the battery to rest.

(8) Upon intimation from the inspector, the battalion commander may direct that each battery in turn be dismissed as soon as inspected.

(9) The band plays during the inspection.

(10) The battalion may be inspected in line, the inspection being conducted according to the same principles as when formed in column. The battalion commander and his staff are inspected at their posts in front of the center of the line; the band, which remains at its post on the right, is next inspected; then the batteries and the standard in their order from right to left.

(11) If the battalion commander is the inspector, the inspection is conducted according to the same principles.

d. Regimental.—Regimental inspection is conducted in a manner similar to that prescribed for a battalion. When the regiment is formed in column, the regimental commander and his staff take post 30 yards in front of the band. The regiment may be inspected in line, the inspection being conducted according to the same principles as when formed in column.

252. Escorts.—*a. Escort of the standard.*—(1) When a new national or regimental standard, or both, are issued to a regiment, they are received with the ceremony of escort of the standard.

(2) If only the regimental standard is received, the national standard does not attend the ceremony. If both standards are received, both standard bearers attend the ceremony and receive the standards. If only the national standard is received,

the regimental standard remains with the guard of the standard at its post with the regiment.

(3) The ceremony is executed mounted by the light and medium field artillery only, and is conducted in a manner similar to that prescribed in Basic Field Manual, Volume II, with the following modifications:

(*a*) ***Present saber*** and ***Carry saber*** are substituted where appropriate for ***Present arms*** and ***Order arms.***

(*b*) The escort marches in flank column, the standard bearers (or bearer) at the center of the column.

(*c*) When halted facing the entrance to the regimental commander's office or quarters the escort is formed in line, the standard bearers midway between the two center sections on a line with the muzzles. The senior lieutenant, the standard bearers, and a sergeant designated by the commander of the escort dismount, their horses being held by a bugler, and receive the standards. They then mount and form facing the center of the escort, the bugler returning to his post. The battery commander commands: 1. ***Present,*** 2. ***SABER.*** The officers of the escort present saber, the regimental standard, if present, and the guidon salute, the buglers sounding *To the standard.*

(*d*) In a motorized battery all officers and men are dismounted after the battery has been formed facing the regimental commander's office or quarters. They are mounted after the buglers have sounded *To the standard.* After the escort has been marched back to the regiment and has been halted in line, opposite the center of the regiment, they are again dismounted.

(*e*) The lead drivers of the escort, when halted facing the regiment, will be 90 yards in front of the line of batteries.

b. Escort of honor.—(1) Complete instructions on the strength and composition of escorts of honor are contained in AR 600–30.

(2) The procedure corresponds to that prescribed in Basic Field Manual, Volume II.

(3) The escort habitually forms in line. It marches in an appropriate formation.

c. Funeral escort.—This ceremony is conducted in a manner similar to that prescribed in Basic Field Manual, Volume II, with the following modifications:

(1) ***Present saber*** and ***Carry saber*** are substituted where appropriate for ***Present arms*** and ***Order arms.*** When the commander of the escort is not armed with a saber, the escort will be brought to attention and the commander of the escort will salute with the hand, wherever it is prescribed that arms will be presented.

(2) When the escort is formed opposite the point at which the casket is received, cannoneers remain mounted.

(3) The escort marches in flank or section column. When the distance to the place of interment or other designated repository is considerable, the escort may march at ease and at a rapid rate until it approaches the burial ground or other place designated for the reception of the remains. The band will not play while marching at ease.

(4) Arriving at the grave, the escort will be formed *in battery* with the center opposite the grave and the gun squads formed in rear of their pieces. During the reading of the services dismounted members of the escort execute parade rest and stand with heads bowed.

(5) After the casket is lowered into the grave and the funeral services are completed, the commander of the escort will bring his command to attention, post the cannoneers, and fire three salvos with blank cartridges. In each salvo pieces will be fired simultaneously.

(6) When it is impracticable for the carriages to approach the grave, or temporary repository, they will be left outside the inclosure. If salvos are to be fired by the artillery, the order in battery will be formed outside the inclosure, sufficient personnel being left therewith to execute the fire. If the escort consists of artillery only, the command will be dismounted and, except the personnel left with the pieces and limbers, will be formed in column of squads and will execute the remainder of the ceremony as prescribed for the funeral escort, dismounted.

(7) At the funeral of a person entitled to the honor a salute corresponding to the grade of the deceased will be fired, in addition to three salvos of artillery or three volleys of musketry.

253. The guidon.—The manual of the guidon, mounted, is prescribed in Basic Field Manual, Volume II.

CHAPTER 2

DISMOUNTED CEREMONIES

254. General rules.—*a.* In pack, horse, and horse-drawn artillery the battery is normally the largest unit that is inspected dismounted. Other types of field artillery may be inspected dismounted by battalion. Dismounted inspections by regiment are exceptional.

b. Reviews for pack, horse, and horse-drawn field artillery are habitually mounted. In dismounted ceremonies, field officers and their staffs may be mounted.

c. At ceremonies, at the command: 1. ***Present,*** 2. ***SABER,*** personnel armed with the pistol execute 1. ***Hand,*** 2. ***SALUTE,*** and come to attention at the command: 1. ***Carry,*** 2. ***SABER.***

d. The manual of the guidon, dismounted, is prescribed in Basic Field Manual, Volume II.

e. In ceremonies executed as prescribed in Basic Field Manual, Volume II, the commands 1. ***Present (carry),*** 2. ***SABER,*** are appropriately substituted for similar commands therein prescribed.

f. When accompanying reviewing or inspecting officers, commanders of troops take posts on the right.

255. Inspections.—*a. Battery.*—(1) Batteries may be inspected in line either in normal formation or in march formation. Unless the inspection is prior to or part of a ceremony, or unless otherwise directed, the normal formation will be employed.

(2) When the battery commander draws saber, lieutenants draw saber.

(3) The command is: 1. ***Open ranks,*** 2. ***MARCH,*** 3. ***Front,*** 4. ***PREPARE FOR INSPECTION.*** At the command ***March,*** ranks are opened. After the command ***Front*** has been executed, the battery commander commands: ***PREPARE FOR INSPECTION.*** At this command lieutenants execute carry saber. The battery commander then returns saber; inspects the chiefs of platoon, the chiefs of section, the front rank, the rear rank, and the file closers, beginning at the right of each rank and returning by the left and rear. Each enlisted man, as the battery commander approaches, executes inspection pistol, and when he has passed executes return pistol. During the inspection of the ranks, the chiefs of platoon face about and stand at ease, or

they may be directed to accompany the battery commander or to assist in the inspection. The battery commander may direct that sections other than that being inspected stand at ease. Upon completion of the inspection, the chiefs of platoon face to the front and resume the attention; the battery commander resumes his post in front of and facing the battery and commands: 1. ***Close ranks,*** 2. ***MARCH.*** At the command ***March,*** ranks are closed.

(4) Should the inspector be other than the battery commander, the latter causes ranks to be opened and takes post in front of the center of the battery. When the inspector approaches, the battery commander faces about, commands: 1. ***Battery,*** 2. ***ATTENTION,*** 3. ***PREPARE FOR INSPECTION,*** faces to the front and salutes. As soon as he has been inspected he returns saber and accompanies the inspector during the inspection of the battery.

b. Battalion.—(1) The battalion may be inspected in line, in line of close columns, or in column of batteries.

(2) The battalion being in the desired formation, the battalion commander commands: ***PREPARE FOR INSPECTION.*** At this command, battery and other appropriate unit commanders give the commands for opening ranks. When the battalion is in column the standard bearer and guard proceed to the head of the column and take position three paces in rear of the noncommissioned staff.

(3) The battalion commander then commands: ***REST,*** returns saber and inspects his staff, the standard bearer, and guard. When the battalion commander approaches the staff, the officers, without command, come to attention and execute carry saber. When they have been inspected they return saber and accompany the battalion commander. As he approaches the standard, the standard bearer brings the guard to attention and commands: ***PREPARE FOR INSPECTION.*** The standard and guard may be dismissed as soon as inspected.

(4) The battalion commander then inspects the band and the batteries in order.

(5) When the inspection of the band has been completed it may be dismissed or be required to play during the inspection, as the battalion commander may direct.

(6) As the battalion commander approaches each battery, its battery commander commands: 1. ***Battery,*** 2. ***ATTENTION,*** 3.

PREPARE FOR INSPECTION, faces to the front and salutes. Having been inspected, he returns saber and accompanies the battalion commander during the inspection of the battery.

(7) At the completion of the inspection of each battery the battalion commander may direct its dismissal.

(8) If the inspecting officer be other than the battalion commander, the latter prepares the battalion for inspection as prescribed above. Upon the approach of the inspecting officer the battalion commander brings the battalion to attention, faces to the front, and salutes. The inspecting officer inspects the battalion commander, who then commands: ***REST,*** returns saber, and accompanies the inspecting officer. The inspection then proceeds as hereinbefore prescribed.

c. Regimental.—Should a regimental inspection, dismounted, be held, the procedure will conform to that prescribed for the battalion.

256. Escorts.—*a. Escort of the standard.*—(1) This ceremony is executed, with obvious modifications, in a manner similar to that prescribed for the escort of the color in Basic Field Manual, Volume II.

(2) The escort marches in column of sections, the standard bearers (or bearer) taking position between the second and third sections of the battery.

(3) An adaptation of this ceremony is appropriate for the formal presentation of the recruits of a regiment to their standard and should be held at least once a year. The regiment being formed, the regimental commander faces to the front and the standards take post three paces in front of and facing him. Upon signal from the adjutant, the recruits of each battery, who are posted on the left of their respective batteries, are marched to the front and center by noncommissioned officers designated for this purpose, and formed in line midway between the regimental commander and the line of battalion commanders. The noncommissioned officers, after halting and aligning their detachments, take post in the line of file closers of their detachments. The national and regimental standards being posted in front of the regimental commander, honors are then rendered as prescribed in the ceremony of escort of the standard. On the conclusion of the salute to the standard, the regimental commander faces about and addresses the recruits in remarks appropriate to the occasion, after which, upon orders, the detachments are marched to their batteries.

b. Funeral escort.—The procedure corresponds to that prescribed for the funeral escort mounted, with the following modifications:

(1) The escort, when halted at the grave, church, or other designated repository is formed in line. When marching, it is formed in column of sections or squads.

(2) Three volleys of blank cartridges are fired over the grave. If pieces are not available and if no portion of the escort is armed with rifles, the firing of the volleys is omitted.

257. Other ceremonies.—Guard mounting, formal or informal, reviews, and parades are executed as prescribed in Basic Field Manual, Volume II, except that in reviews and parades the march past may be in column of batteries or column of sections, and units larger than battalions are usually formed in line of close columns.

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* See also Volume II.

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