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MANUAL

FOR

RIFLE PRACTICE.

INCLUDING A COMPLETE GUIDE TO INSTRUCTION IN THE USE AND CARE OF THE MODERN BREECH-LOADER.

BY

GEO. W. WINGATE.

WITH DIAGRAMS AND ILLUSTRATIONS.

NEW YORK:
W. C. & F. P. CHURCH,
ARMY AND NAVY JOURNAL, 89 PARK ROW.
1872.
EXTRACT from the Minutes of the Meeting of the Board of Directors of "THE NATIONAL RIFLE ASSOCIATION," held at the City of New York, March 5, 1872.

The following notice, offered by GENERAL SHAVER, was passed by a unanimous vote:

Resolved, That the MANUAL OF RIFLE PRACTICE, prepared by CAPT. GEORGE W. WINGATE, and which has been examined and approved by the Major-Generals commanding the First and Second Divisions N. G. S. N. G., be approved and adopted by this Association, and that the Commander-in-Chief be requested, if the same meets his approval, to adopt the same officially for the use of the National Guard.

________________________

GENERAL HEADQUARTERS STATE OF NEW YORK,
ADJUTANT-GENERAL'S OFFICE,
ALBANY, Oct. 4, 1872.

General Orders, No. 18.

"The Manual for Rifle Practice, by Geo. W. Wingate"—except in so far as it conflicts with the "Manual for Loading and Firing the Remington Breech-loading Rifle, New York State Model," prepared by Brevet Major-General James McQuade, Inspector-General (which has already been adopted), is hereby approved and recommended as a suitable guide to instruction in the use and care of the arms now being issued to the National Guard of this State.

By order of the Commander-in-Chief,

FRANKLIN TOWNSEND,
Adjutant-General.

Entered according to Act of Congress, in the year 1872, by

W. C. & F. P. CHURCH,
In the Office of the Librarian of Congress, at Washington, D. C.

\( F \)
PREFACE.

With the introduction of a breech-loading rifle as the arm of the National Guard, the question as to the proper method of instruction in its use has become of the utmost importance. In all European countries marksmanship has been recognized as one of the most important parts of the School of the Soldier, more than doubling the efficiency of the men, by giving them a steadiness and confidence in action not to be obtained by other methods, and particularly by preventing the waste of ammunition so apt to follow from putting a breech-loading arm in the hands of inexperienced troops. So thoroughly is this principle recognized, that the English army regulations assert officially "that a man who cannot shoot is useless, and an incumbrance to the battalion." (Revised Musketry Regulations, p. 7.)
Hitherto it has been generally supposed that skill in marksmanship could only be obtained by a long course of target practice; and this being frequently impracticable, the National Guard have been allowed to remain without instruction in rifle practice, many men serving their entire term of enlistment without firing a shot.

It is now, however, settled that, so far from actual target practice being the only way in which proficiency in marksmanship can be secured, men often shoot worse instead of better, from mere practice; and that, by the system which is described in the following work, it is as easy by drill alone to acquire skill in marksmanship as in the Manual of Arms. Nor could any system be imagined better adapted to the wants of such an organization as the National Guard. Its main principles are easily taught by instruction and example in the drill-room. The "position" and "aiming" drill upon which it is based, can be gone through with in the same manner as any part of the "Manual," and the practice which constitutes perfection
can be even had at home, in aiming at a wafer pasted upon the wall. Only the distance drill and target practice require to be performed out of doors, and a very fair proficiency in the use of the rifle at known distances can be acquired without these practices.

The following suggestions have been compiled at the request of The National Rifle Association, for the purpose of assisting those officers and members of the National Guard who may desire to perfect themselves and the organizations to which they belong, in rifle-practice, and who have not the time to make an elaborate investigation of the subject. The intention, therefore, has been to divest the matter of all unnecessary technicalities, and not only afford a Manual for “aiming drill,” but to point out such details for the regulation of target practice, as the author's experience as an officer in that organization has induced him to consider most advantageous, under the peculiar circumstances in which its members are situated.

Desiring to submit nothing but what has
been thoroughly tested by experience, the author has made extensive use of The Revised Musketery Regulations of the British Army (being what is known as the Hythe system), of the "Exerzir Reglement für die Infanterie der Königlich—Preussischen Armee" (Berlin, 1870), of Major Willard's "Manual of Target Practice" (adopted by the U. S. War Department in 1862), as well as of the French "Instruction provisoire sur le Tir, à l'usage des bataillons de Chasseurs à Pied," together with the valuable suggestions contained in Lieut. Russell's "Hand-book of Rifle Shooting," Busk's "Hand-book for Hythe," and several similar standard works; and is also indebted to Major-General Alexander Shaler, commanding the First Division N. G. S. N. Y., for many valuable suggestions.

NOTE TO THE SECOND EDITION.

The unexpected demand for this work having made a second edition necessary, the author has taken advantage of the occasion to make a few alterations in the text, which have been found by experience to be advisable, the most important being the provision that men practising with breech-loaders shall step to the firing-point by file instead of singly.
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PART I.

INSTRUCTION IN MUSKETRY.

1. Every commanding officer is responsible for the instruction of his command in musketry. He will make himself acquainted with this most important part of a soldier's duty by careful study of the following regulations, by giving personal superintendence to the companies under instruction, and by availing himself of the assistance and information to be derived from the existing works on the subject.

2. He will assemble the officers under his command for theoretical and practical instruction as often as he may judge necessary, and will conduct all correspondence on the subject and be answerable for the correctness of all returns, etc. When unable to attend to these duties in person, they will be discharged by the officer next in rank.

3. Captains and lieutenants are to make
themselves equally conversant with these regulations as with the tactics, are to be present at the musketry drill and practice of their companies, to acquaint themselves with the proficiency of every member thereof in marksman-ship and judging distance, and are to be encouraged to take part in the preliminary drills and individual firing, but their points are not to be included in the "figure of merit." All junior officers are to go through the entire course prescribed for recruits.

4. While the company officers are charged with the instruction of their companies in this branch of their duties, it is the commandant of the regiment who is responsible for the due carrying out of these regulations, and for the due training of both officers and men in their respective duties. It is therefore the express duty of the commanding officer to report to his superior officer all who, by neglecting to attain a thorough knowledge of their duty, disqualify themselves for their position as company officers.

5. The sergeants in every company shall attend with their company when under instruction and assist the instructor in his duties, and are to be especially charged, under the orders of their captain, with the duty of seeing that the men keep up the instruction they have received
in the cleaning and management of their arms.

6. The non-commissioned officers are to be first instructed in the course if practicable, and are to assist in the instruction of the men of their respective companies.

7. Individual instruction being the basis of marksmanship on which the efficiency of the company depends, and first principles having the greatest influence upon individual instruction, classes of recruits should be watched with the greatest care.

8. As many portions of the "position" and "aiming" drill depend upon movements which cannot be readily detected when erroneously performed, instructors will be careful not only to explain clearly every movement, but to make the men understand the reason why such movement is prescribed and the effect of any deviation therefrom. They will use every endeavor to illustrate their instruction by the use of diagrams and models, as well as by personal example. They should keep up the attention of the men by an animated tone, and be careful so to manage the drill as to avoid unnecessarily wearying them.
PART II.

INSTRUCTION OF THE SOLDIER.

9. The instruction in musketry is divided into—

1. Preliminary Drill.
2. Practice.

10. Under the head of Preliminary Drill are comprised the following subjects.

1. Instruction in the care of the rifle.
2. Theoretical principles.
3. Sighting drill.
4. Position drill.
5. Aiming drill.
6. Candle practice.
8. Armory ball practice.
11. Under the head of Practice are comprised the following:
   1. Firing with ball singly.
   2. Firing by file.
   3. Firing by volley.
   4. Firing as skirmishers (or advancing and retreating).

12. As soon as a recruit has learned the "school of the soldier," he will be put through the course of musketry instruction.

13. Special care should be devoted to impressing upon the soldier that not only his military efficiency but his own safety depends upon his being able to use his rifle efficiently, and that no degree of proficiency in the other parts of his drill can, when in service, remedy a want of proficiency in marksman-ship.

14. The instructor should not allow the recruits to be discouraged by any previous ignorance in the use of arms, nor by any imagined unsteadiness of nerves, but should explain to them in the first instance, that any man who has no defect in his sight can by perseverance become a good shot. That so far from incessant practice being necessary, a very fair degree of skill at known distances may be acquired by individual practice when off duty in "position"
and "aiming drill," "snapping caps," &c.,* provided care is taken to strictly follow these regulations in such practice, and keep in mind that any variance from them will establish habits that it will be extremely difficult to cure.

* See diagrams of targets for private practice, Appendix, p. 185.
PART III.

PRELIMINARY DRILL.

ARTICLE I.

CARE OF THE RIFLE.

15. In this exercise the soldier is to be taught the names of the different parts of the rifle, the rules for taking it apart and cleaning it, and how to preserve it from injury.

16. The officers and non-commissioned officers should first be instructed in the course, to qualify them for instructors; after which the company can be divided into as many squads as there are instructors.

17. Each squad should be assembled in its quarters under charge of an officer, if practicable; or, in the absence of an officer, a well-instructed and careful non-commissioned officer, who will require each man to take his rifle apart in the prescribed order—being careful to explain as they progress what is laid down in the instructions below relating to the care and cleaning of arms.
18. The recruit will be first taught to name the parts of the lock and explain how to dismount it, the parts to be named in the order in which they are removed.

19. As the Springfield muzzle-loading rifle is being abandoned, no instructions in regard to it are given. The Remington rifle having been adopted for the use of the National Guard it will be referred to whenever practicable in this work.

20. Where the Remington rifle is used, the men will be required to name the important parts of the lock, and state their use as follows:

1. (A A A.) The Receiver or Breech Frame, which unites the several parts to each other and to the barrel and stock.

2. (B.) The Breech Block, which closes the chamber.

3. (C.) The Hammer, which locks the breech-block and fires the cartridge.

4. (D.) The Extractor, a flat disk let into an annular groove in the breech-block, having a motion with and independent of the block.*

5. (E F.) The breech-block and hammer-pins, respectively; these pins are held in

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* A full description of the action of this system, together with three illustrative cuts, prepared since these pages were stereotyped, will be found in the Appendix at page 180. The references are to these cuts.
place by a button on the outside of the receiver.

6. (a.) The Trigger.
7. (b.) The Sear.
8. (c.) The Secondary Sear.
9. (e.) The Firing-Pin Retractor.
10. (d.) Projection of Secondary Sear.
11. (f.) The Firing-Pin.
12. (g.) The Main Spring.
14. (i.) Spring, retaining c in recess of breech-block.
15. (k.) Trigger Spring.
16. (l.) Retractor Spring.

17. The Guard is the part to which the trigger, trigger-spring, sear, secondary sear, springs, and main-spring are attached, and is fastened to the breech-block by two side-screws.

18. The button, which partially covers the breech and hammer pins on the outside and secures them in place.

19. The button-screw, which fastens the button to the receiver.

The other parts, not mentioned above, are:

Guard Swivel, Guard Swivel Pin, Sear Spring Screws, Main Spring Screw, Main Spring Stop Pin, Recoil Stud Screw, Recoil Stud Dowel Pin, Tung Screw, Trigger Pin, Trigger Pin Screw.
21. They will then be taught to take apart and assemble the different parts of the piece as follows:

22. TO REMOVE THE BREECH-PIECE AND HAMMER.

1. Loosen the button-screw until the button can be removed from the heads of the breech and hammer-pins.

2. Cock the hammer, push out the breech-pin, take out the breech-piece, let down the hammer as far as it will go (which leaves the main-spring resting upon a stationary pin and obviates the necessity of using a main-spring vice in readjusting the parts.)

3. Remove the hammer-pin and take out the hammer.

23. TO REPLACE THE HAMMER AND BREECH-PIECE.

1. Lay the arm down on the right side, press upon the trigger, at the same time replacing the hammer with the thumb-piece forward and downward, until the hole in the hammer and receiver corresponds.

2. Replace the hammer-pin, cock the hammer, replace the breech-piece, insert breech-pin in receiver and by pressing on the pin, at the same time pressing down the breech-piece and working it back and forth slightly the pin will enter.
3. Adjust the button and tighten the button-screw.

24. TO TAKE THE ENTIRE ARM APART.

1. Take out the extractor-screw, open the breech, remove the extractor, take out the breech-piece and hammer as above described.
2. Remove the wiping-rod by unscrewing the same, remove the bands, separate the tip-stock from the barrel at the muzzle until it is liberated from the stud upon the under side of the barrel, when it may be withdrawn from the receiver, take out the tang-screw, remove the butt-stock.
3. To detach the guard-strap take out the two side-screws, which pass through the guard-strap, always removing the rear screw first.
4. Unscrew the barrel from the receiver, taking care that the extractor has been removed before unscrewing the barrel. This operation, however, should not be done except by an experienced armorer and with proper tools.

25. TO ASSEMBLE THE ARM.

1. Screw the barrel in the receiver until the mark on top of the barrel and receiver correspond.
2. Replace the extractor and screw, place
the forward end of the guard-strap in the receiver, putting in the screw.

3. See that the main-spring is in the centre of the guard-strap.

4. Press the rear end in until the screw will enter.

5. Replace hammer and breech-piece as previously described.

6. Replace butt-stock and tip.

7. In putting on the bands see that the letters upon them are on the same with the bandsprings.

8. Replace the wiping-rod by screwing it in.

26. They will then be instructed in the following rules for cleaning the lock and other parts of the piece:

27. TO CLEAN THE LOCK.

Wipe every part with an oiled rag, and then a dry one; if any part of the interior shows rust, put a drop of oil on the point or end of a piece of soft wood; rub out the rust, clean and wipe the surface dry; then rub every part with a slightly oiled rag.

28. No emery nor powder of any kind should be used, to avoid the danger of removing the case-hardening and thus increasing the liability to rust.

29. In remounting the lock, the threads of
the screws, the pins, and the locking-lever should be oiled before being replaced.

30. Only a small quantity of oil should be used, as too much is likely to clog the parts.

TO CLEAN THE RIFLE.

31. Where the men are provided with the brush issued with the Remington rifles, it should always be used to clean out the barrel, dipping it in hot water or still better in benzine, and afterwards drying and oiling the barrel as hereinafter prescribed. In other cases the following method will be followed.

32. Hold the rifle muzzle-downward at a convenient angle, with the breech-block open, and pour hot water through the barrel so as to loosen the dirt or fouling left by the powder, and being careful to avoid wetting the breech-block or lock.

33. Place a wet rag (woolen if possible) upon the cleaning rod, being careful to see that its head is equally covered all around, press it into the bore first from the muzzle, and (as the ram-rod is shorter from than the barrel) afterwards from the chamber, and rub it up and down until the barrel is clean, being careful not to mar the corners of the chamber by the shoulder of the ramrod.

34. Wipe the barrel well out with a rag or
tow as before until it is perfectly dry, and afterwards with an oiled rag. The men should be cautioned that if the barrel be not perfectly dry, it will rust, no matter how much oil is afterwards applied. For this reason benzine is preferable to water in cleaning, and warm water to cold. After oiling, the rifle should be allowed to stand for a time and then carefully wiped.

35. Wipe the surfaces of the hammer-breech block, firing pin, etc., with a slightly oiled rag.

36. Close the breech-block, let down the hammer, and replace the tompion.

37. No attempt should be made to drag a ramrod out of the barrel by extreme force when it sticks fast, as the bore is almost certain to be injured by so doing. When such a case occurs it should be removed by an armorer.

38. After firing, the bore should always be wiped out as soon as practicable, until both clean and dry, and then rubbed with a rag moistened with oil. If it is found necessary to take out the breech-block and hammer, first turn out the screw which holds the button, cock the hammer and close the breech-block, remove the breech-block pin without battering it, and then remove the breech-block. Afterwards let down the hammer and take out the hammer-pin.
39. In cleaning the barrel, unless the regulation brush can be obtained, a wooden "wiping stick" should be used whenever practicable. A metal rod, unless particular care is taken to see that its head is entirely enveloped in the cleaning rag, is apt to injure the grooves of the rifling.

40. Care should also be taken to prevent water from penetrating between the wood and metal of the piece. This can be guarded against by rubbing in a little bees-wax, and the necessity of taking the barrel from the stock, which is objectionable, may thus be avoided.

41. The lock should be free from rust and dirt, and slightly oiled. Sewing-machine or watchmakers' oil is commonly used upon a rifle. Sweet oil should be rejected, as likely to "gum."

TO CLEAN THE MOUNTINGS.

42. For the mountings, and all iron and steel parts, use a rag moistened with oil of emery, or emery cloth may be used when rust has set it; but care must be used not to rub off the browning or case-hardening by so doing. For brass use rotten-stone moistened with vinegar or

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* The Canadians have found "Rangoon oil" such a valuable preventative of rust as to cause it to be officially recommended and furnished to their militia.
water, and avoid oil or grease. Use a hard brush or a piece of soft pine, cedar, or crocus-cloth. Remove dirt from the screw-holes by screwing a piece of soft wood into them. Wipe clean with a linen rag, and leave the parts slightly oiled. In cleaning the arms, the aim should be to preserve the qualities essential to service, rather than to obtain a bright polish. Burnishing the barrel (or other parts) should be strictly avoided, as it tends to crook the barrel and also to destroy the uniformity of the exterior finish of the arm.

HANDLING THE RIFLE.

43. The instructor should impress upon the men that not only does their efficiency in service depend upon their understanding how their rifles should be kept in order, but that, if ambitious of becoming marksmen, it is essential that they should understand their construction, and see themselves that they are always in a condition to do them justice.

44. He should explain to them that a well-made rifle is a delicately constructed instrument and requires proper attention, and unless it is kept clean, good shooting cannot be expected from it. That the grooves become filled up, and when it is fired, the bullet "leads," its velocity is diminished, and it falls short; that
every man must therefore clean out the barrel of his piece as frequently as possible, and never allow it to be put away dirty, as one night's rusting will do it more harm than a year's use.

45. He should also make the men understand that notwithstanding any care they may exercise in keeping their rifles clean, they will not be accurate unless they are careful in handling them.

46. He should explain that the barrels of military rifles are made as thin as possible to diminish their weight, and consequently, it is easy to indent or mar them, and once this is done, they are useless so far as accuracy is concerned. The men should, therefore, be cautioned that in placing the piece in the gunrack, or in stacking it, it is important that it should be handled gently, and under no circumstances should a man sit on his piece or use it for carrying weights, or for any other purpose than that for which it is intended.

47. The men should be instructed that in ordering arms on parade, the butt should be brought gently to the ground, especially on pavements or hard roads. This will save the mechanism of the lock from shocks, highly injurious to it, from loosening the screws and splitting the woodwork.

48. In stacking arms, care should be taken
not to injure the bayonets by forcibly straining the edges against each other. The stack can be as well secured without such force being used. No cutting, marking, or scraping, in any way, the wood or iron, should be allowed; and no part of the gun should be touched with a file. Take every possible care to prevent water from getting in between the barrel and stock. If any should get there, dismount the gun as soon as possible, clean and oil the parts as in reassembling.

49. The men should be instructed that they must be careful to prevent the foresight from being bent, blunted, or injured in any way.

50. Also, that if any obstruction should find its way into the barrel, either from running the muzzle into the ground or from a wad lodging, it should be removed before the rifle is fired; for if fired with any obstruction of that character, or even with an air-space between the bullet and the powder, the barrel is liable to burst.

51. Too much care cannot be exercised by officers to see that the rifles of their command are properly taken care of. Where an armorer has charge of the pieces, he should be carefully supervised, to see that the locks and internal parts of the rifles are properly cared for, and that the grooves of the barrel are not injured.
by the use of iron rods in cleaning, as the accuracy of many pieces is destroyed by this practice.

52. Where the ordinary Remington rifle is used, the firing-pin is withdrawn by a spring and the piece is loaded at full cock. In the improved model adopted by the State of New York, the firing-pin is withdrawn by a positive motion, and the hammer falls to an assimilated half-cock when the breech-block is closed after loading, thus removing all possibility of premature explosion.

53. The chamber should be kept clean, and great care observed to prevent cartridges fouled with dirt, and particularly sand, from being inserted or discharged in the piece, as the expansion of the shell presses the sand into the metal and mars the surface of the chamber, and thus causes the shells to stick. Care should also be taken in cleaning the chamber for the same reason. The shell of an exploded cartridge should not be allowed to remain in the chamber any length of time for fear it may adhere by corrosion. Great attention should be paid to ammunition, not only to see that it is kept in a clean box and free from dirt and sand, but that it is good; as no marksman can succeed with poor ammunition.
54. To prevent premature discharges and to relieve the firing-pin spring, the piece should be always kept at half-cock.

55. As rust is caused by the combined action of air and moisture, a tight-fitting tompion should be placed in the barrel when put away (care being taken that it be kept out when on the range, to avoid the liability of injuring or possibly bursting the barrel in firing) and a nipple-cover or greased rag be kept on the nipple of all muzzle-loaders, with the hammer down. With breech-loaders a greased wad may be inserted in the chamber to keep the air out of the barrel.

56. Officers will be careful to see that the rifles of their command are kept in a dry room, and on no account against an outside wall, and that they are examined about once a week to see that no rust is formed.
ARTICLE II.

THEORETICAL INSTRUCTION.

57. To become marksmen men must understand the course taken by a bullet when fired from a rifle, and the manner in which that course is controlled by using the sights. This is to be explained orally, the instructor being provided with a blackboard and chalk, and being able to draw the diagrams shown in Plate 3.

58. He should first explain that, if a barrel be held horizontally, a ball fired from it proceeds in a like direction, known as the "line of fire" (A. B., Fig. 1, Plate 3); but that, after it has gone a certain distance, it commences to fall, through gravitation, until it strikes the ground, describing a course (A. C., Fig. 1, Plate 3), like water out of a hose-pipe, the rule being that an object falls to the earth a certain distance in a second, and does this whether it be simply dropped or thrown horizontally. Consequently, the faster a ball is propelled, the further it will go in the time required for it to reach the earth, and therefore the more level its path, or, to use the language more generally employed, the flatter its trajectory.
59. That when the muzzle is raised, the ball describes a higher arc and consequently goes further (Fig. 2, Plate 3), first rising above the line of sight and then falling below it. Therefore, to hit an object at a distance, the "line of fire" must be laid as much above the object, as the ball would pass below it if the barrel were horizontal when fired. That this elevation is obtained by raising the back sight upon which the distances are marked; so that if the marksman be certain of his distance he need not trouble himself about the elevation.*

60. The instructor will then explain that if, in aiming, the back-sight, instead of being held upright, is twisted over to one side, it results in not only making the elevation lower than was intended, but also throws the line of the foresight to one-side; consequently, a ball fired under these circumstances, invariably strikes low and on the side to which the sight is inclined; and of course, the greater the distance, the greater the error.

61. To illustrate this, place a breech-loading rifle, or a rifle-barrel with the breech-pin out, upon the (aiming) sand-bag, turning it so that the sights will be to the right or left; raise the

* The distance the ball will go before striking the earth will be ascertained by the following formula: $h = \frac{1}{2} gt^2$, the velocity being from 13 to 1,600 feet a second, according to the charge.
500 yard sight, and aim at the wall; place a \( \text{wafer} \) at the point the line of sight strikes the wall, then without moving the piece, look through the barrel, and place another wafer where the axis of the barrel prolonged would strike the wall. This will at once show the men the necessity of having the line of sight in the same vertical plane as the axis of the piece.

62. In order to further show the loss in elevation arising from twisting the piece, let a card, marked with a scale corresponding to those upon the back sight, be placed vertically in front of the latter, while the piece is resting on the sand-bag in an inclined position; the men will at once see the amount of elevation lost by any degree of inclination.

63. The men should be taught that the true "point blank" of a piece is when it is so held that the extreme point of the foresight is in line with the bottom of the notch in the back sight, and that in shooting at ranges under 100...
yards, they should aim a little under the object they propose to hit, at the same time drawing a "fine sight" (as explained at Paragraph 82), for the reason that a slight elevation will necessarily be given, if any of the foresight is seen.

64. The instructor should also impress upon the men the necessity of their being correct judges of distance, so as to be able to adjust their back sights to the proper elevation; and explain that, if this is not done, the soldier, no matter how good a shot he may be at a fixed mark, will be unsuccessful in hitting his enemy in the field, which is the object of all his training.

The men must, therefore, be thoroughly trained to judge of distances by the eye alone.

65. To assist in these explanations the following tables are given to show the trajectory of a military rifle when fired at different ranges with the proper elevation:

66. The trajectory in firing at 300 yards is as follows:

<table>
<thead>
<tr>
<th>Horizontal Distance from Muzzle</th>
<th>50 yds.</th>
<th>75 yds.</th>
<th>100 yds.</th>
<th>125 yds.</th>
<th>150 yds.</th>
<th>175 yds.</th>
<th>200 yds.</th>
<th>225 yds.</th>
<th>250 yds.</th>
<th>275 yds.</th>
<th>300 yds.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height of trajectory in inches above line of sight</td>
<td>14.2</td>
<td>21</td>
<td>26.5</td>
<td>33.5</td>
<td>35.5</td>
<td>36</td>
<td>32.5</td>
<td>27</td>
<td>20</td>
<td>11.7</td>
<td>0</td>
</tr>
</tbody>
</table>
67. And the "dangerous space" for an infantry man is as follows—being calculated under the assumption that the gun, when fired, is 56 inches from the ground, that it is aimed at a point 34 inches from the ground, and that the stature of a man is 68 inches.

**DANGEROUS SPACE.*

<table>
<thead>
<tr>
<th>HORIZONTAL DISTANCE</th>
<th>RISING BRANCH OF TRAJECTORY</th>
<th>FALLING BRANCH OF TRAJECTORY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before the object.</td>
<td>Beyond the object.</td>
<td></td>
</tr>
<tr>
<td>200 yds.</td>
<td>75 yds.</td>
<td>125 yds.</td>
<td>262 yds.</td>
</tr>
<tr>
<td>300 &quot;</td>
<td>85 &quot;</td>
<td>82 &quot;</td>
<td>172 &quot;</td>
</tr>
<tr>
<td>500 &quot;</td>
<td>19 &quot;</td>
<td>42 &quot;</td>
<td>55 &quot;</td>
</tr>
<tr>
<td>700 &quot;</td>
<td>10.5 &quot;</td>
<td>26 &quot;</td>
<td>35.5 &quot;</td>
</tr>
<tr>
<td>900 &quot;</td>
<td>7.5 &quot;</td>
<td>10.5 &quot;</td>
<td>22.8 &quot;</td>
</tr>
<tr>
<td>1050 &quot;</td>
<td>4.5 &quot;</td>
<td>8.5 &quot;</td>
<td>11.5 &quot;</td>
</tr>
</tbody>
</table>

68. Thus the dangerous space in firing at a man's waist at 100 yards is 205 yards—the distance the ball would travel before striking the ground. If the enemy were to advance to the muzzle of the rifle or retire to the latter distance, he would still be hit in the body or feet. It will also be seen that in firing at an object with the sight elevated for 700 yards, the bullet after going 10.5 yards rises into the air, and does not descend low enough to hit a man until it reaches the distance of 674 yards, and

* This distance is decidedly greater than with the Springfield or Enfield rifle.
strikes the ground at the distance of 722.8 yards. Consequently it will strike some distance above the mark if it should be 670 yards off, and several feet under it, if it should be distant 725 yards; and the greater the distance the greater the necessity for knowing it accurately.

69. The men should therefore be instructed, when not certain of their distance in the field, to fire under rather than over the correct one, so as to form an opinion of the distance by observing the dust thrown up by the bullets striking the ground. They should also be cautioned that a side wind will carry the bullet in the direction in which it is blowing, while a front wind, by reducing the speed of the bullet, diminishes the range, a rear wind having the contrary effect; that this is to be guarded against by aiming to one side or the other or above or below, but that the allowance necessary to be made can only be ascertained from experience.

70. In firing during a wind, or at an object in motion, the instructor should explain that the best way is to aim in the usual way, and then, without dwelling an instant on the aim, move the rifle laterally in the direction and to the extent required, by simply turning on the hips, the arms and eye being kept perfectly steady.
71. The instructor should also state that when the sun is shining from one side, it lightens up that side of the front sight and the opposite side of the notch of the back sight; and that the marksman, in taking aim, is apt to take these brilliant spots for the real centres of the sights, and consequently to shoot towards the side away from the sun.

72. As some rifles carry higher and some lower than the average, the men must be instructed that this is to be remedied by taking a fine sight (see Paragraph 82) with a piece that carries high, and a coarse sight with one that carries low, as they find by experience that their rifles do not shoot correctly; and that, if the sights should be so placed as to make the piece carry to one side, they must make such allowances as they find are required to make up for it. If in doubt in regard to the accuracy of their rifles, they should be permitted to test them by firing from a fixed rest.

73. The explanations upon these branches of the subject should be made clearly and plainly until thoroughly understood, the men being frequently questioned as the instructor proceeds, as well to secure their attention as to ensure their comprehending his remarks. These explanations should also be repeated at least once
a year, and it should be the endeavor of all instructors to make themselves masters of the subject so as to explain the principles upon which a rifle is constructed and used, to an extent beyond the limits of this work; for which purpose they are referred to the books mentioned in the introduction to this manual, together with the numerous other works existing on the subject of rifle practice.

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**ARTICLE III**

**SIGHTING DRILL.**

74. In this exercise, the men are to be instructed how to properly adjust the sights of their rifles in aiming.

75. For this purpose a bag of sand is to be placed on a rest, either a table or a tripod composed of three stakes tied near the top, and so as to be 4½ feet from the ground.

76. The men are to be formed in single rank, in squads not to exceed ten men in each, each man having his own rifle.

77. The instructor will then flatten the sandbag with the back of his hand, and lay a rifle on it aimed at some small object (as a wafer
on the wall) at as great a distance as the drill-room will permit, and explain to the men the following simple rules:

78. That the sights should not incline to the right or left.

79. That the line of sight should be taken along the centre of the notch of the back sight and the top of the fore sight, which should cover the middle of the mark aimed at.

80. That the eye should be fixed on the mark, and not on the fore sight. Particular attention should be paid to this rule, as beginners are apt to fix the eye on the fore sight and not on the mark, which prevents the latter from being distinctly seen, and greatly increases the difficulty in aiming.

81. The instructor should also explain the different kinds of sights, viz.:

FINE SIGHT.

82. When the point of the forward sight is just seen through the notch of the breech sight, the effect of which is to shoot low.

FULL SIGHT.

83. When the whole of the wedge-shaped portion of the front sight is displayed through the notch on the
breech sight, the effect of which is to shoot high.

**HALF SIGHT.**

84. When but half the fore sight is seen, which is the kind of sight that should generally be adopted by beginners.

85. It should be impressed upon the men that the wedge-shaped part of the front sight is all that should appear through the breech sight, and that beginners are much more apt to show too much of this than too little, and consequently, generally shoot too high.

86. When the foregoing rules have been clearly explained, and the men have been questioned in regard to them, the instructor should direct each man in succession to adjust his rifle upon the bag to the proper aim at the mark, and then to step aside.

87. He will then examine it, and, if he discovers any defect, call up another man, who is to look along the sights, and explain the error. The instructor will then explain what the consequence would have been, if actually firing at an object, and cause the man to aim again.

88. In addition to practicing this exercise in the drill-room, it should also be performed in the field, at different distances, so as to perfect
the men in the use of their sights and in aiming; for the difficulty of correctly aligning the foresight increases with the distance. There should be not less than six drills in this exercise for recruits, of half an hour each—the first at 100 or 150 yards, the second at 200, 250, and 300 yards—each successive drill being at increased distances, the last being at 800, 850, and 900 yards. In the annual course for drilled soldiers there should be four drills of one hour each, at such distances as may be prescribed by the instructor.

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ARTICLE IV.

POSITION DRILL.

89. Position and aiming drill are but modifications of the same exercise, the former being intended to exercise the muscles and teach the proper method of holding the piece; and the latter, in addition to exercising the muscles, being designed to teach steadiness and that uniform, instantaneous action of hand and eye which constitutes marksmanship.

90. Before entering upon this drill, the instructor should explain to the men that the
reason why long practice is usually required to constitute a marksman, when nothing but experience is relied upon, is that, in firing, the smoke and flash of the explosion prevent any movement of the piece from being observed; so that the learner, seeing simply that he has missed his mark, without understanding how he came to do so, is only able to ascertain and correct his faults (if he ever does), by degrees, and after a great waste of ammunition. That the system of position and aiming drill proceeds upon a different principle, the men, before being permitted to fire their pieces, being taught to assume a position which, although somewhat stiff, and different from that to which they may have been accustomed in using a heavy sporting rifle, has been found by experience best calculated to ensure steadiness, and guard against the sharp recoil* resulting from the explosion of the heavy charge used in light military rifles; and being also instructed to avoid all errors in holding their pieces. By then going through all the motions of aiming and firing with empty pieces, as if they were loaded, they are enabled to see for themselves

* The Remington rifle, weighing nine pounds, loaded with 70 grains of powder and a ball weighing 450 grains, is found, on being tested by a spiral spring applied to the butt, to recoil with the force of 95 pounds.
if they are pulling their sights off the target when firing, and thus have a greater experience in handling their rifles, than they would obtain by firing with ball, by being enabled, through noticing the movement of the sights, at once to discern and correct errors which otherwise they would have found out only by accident.

91. These drills will be conducted in the company quarters or drill-room. For this purpose a series of black bull's-eyes, the size of a silver quarter-dollar, on a white centre about an inch and a half in diameter, should be painted upon the armory wall (red and white notarial seals form a good substitute). They should be elevated three feet from the floor, and a similar distance apart.

92. When the drill is by gas-light, these bull's-eyes should be placed so as to afford a good light, not only upon the targets, but at the firing point, so that the men can see both their sights without being dazzled. The lights at the firing point had better be behind than in front of the men, and those over the targets be shaded if possible.

93. No piece should be allowed to have a trigger pull of less than six pounds.

94. The men should be divided into squads of not more than twelve to each instructor. Each squad should be formed in single rank,
one pace apart, and be placed at first about twenty feet from the marks to be aimed at (the distance being gradually increased, according to the light and the size of the room), and "dressed" so that each man shall be opposite a target. It will be found that this practice is calculated to strengthen the sight, and after a time the men will easily discern the sights at double the distance.

95. The practice should habitually be executed in marching order, and with fixed bayonets when standing, and unfixed bayonets when kneeling. The men will not be permitted to shoot from the shoulder during these exercises.

96. The squad having been formed as above directed, with their pieces at a "carry," the instructor having first cautioned the men not to cock their pieces, will command:

1. Squad, as skirmishers. 2. Ready.

(One time and two motions.)

97. (First motion.) Raise the piece slightly with the right hand, making a half face to the right on the left heel; carry the right foot from twelve to eighteen inches to the rear (according to the size of the man), bringing the left shoulder well to the front, the left breast over the left foot, the feet at right angles, the right heel a little to the right of the
prolongation of the left, the toes and knees slightly turned inward, and the latter not only pressed inward, but backward, with a slight tension of the calves, so as to secure a firm hold for the feet (every part of which should be placed on the ground), the body equally and firmly balanced upon both feet and carried naturally upon the hips, without drawing in the stomach, raising the breast, or bending the small of the back;* grasp the piece with the left hand at the lower band and detach it slightly from the shoulder, the head not inclined, but perfectly perpendicular, both eyes open and directed steadily at the mark.

98. (Second motion.) Bring down the piece with both hands, the muzzle the height of the eye, the left hand grasping the piece behind the lower band (or at its balancing point), the thumb extended along the stock, the barrel resting in the palm of the hand, the left elbow against the body, the small of the stock two inches below the right breast, the butt below the right elbow. The right hand will grasp the small of the stock, the fingers behind the guard, the thumb bent obliquely forward over the small of the stock, so that, if possible, it shall rest upon the end point of the middle

* This is a point upon which particular stress is laid in the Prussian regulations.

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finger, both hands holding the rifle firmly, but not so tightly as to impart motion to it from the pulsation of the body, the whole position being as easy and natural as possible.

99. The instructor will then command:

1. Position Drill, by motion. 2. One; 3. Two; 4. Three.

(One time and three motions.)

100. At the command One, each man will throw his piece quickly forward to the full extension of his left arm, both arms moving close to the body, the elbows downward. The barrel will be held nearly horizontal, the muzzle slightly depressed, the top of the heel-plate to be on a line with the top part of the shoulder, the trigger finger to be placed inside the guard.

101. At the command Two, the piece will be pressed smartly with both hands against the hollow of the shoulder, which must neither be allowed to give way nor pressed forward or raised to meet it; the left elbow at the same time being brought as far under the rifle as is possible without assuming an unnatural position, the right elbow slightly advanced, being nearly square with the right shoulder. The centre (or rather the upper than lower) part of the butt to be pressed firmly against the shoulder with the left hand without touch-
ing the collar-bone, the top of the butt being as nearly as possible with the top of the shoulder. The forefinger will be placed around the trigger like a hook, but without pressing it. The head and body will be kept perfectly perpendicular the whole time, no attempt being made to look through the sights.

102. At the command Three, the piece will be brought smartly to the position of "Ready," the position of the feet and body remaining unchanged, the forefinger being slipped behind the guard.

103. Whenever the instructor wishes to suspend the exercise, he will command:


(One time and one motion.)

At the second command, throw up the piece briskly with the left hand, the right grasping it as in Carry arms; at the same time face to the front and bring the right heel on a line with the left; drop the left hand by the side.

104. The instructor will cause these movements to be practiced kneeling. For this purpose he will cause the squad to be formed as directed in paragraphs 94 to 96, and (having cautioned the men not to cock their pieces), will command:
1. **Squad, as skirmishers, kneeling.** 2. **Ready.**

 *(One time and two motions.)*

105. At the first command each man will bring the left toe square to the front, and plant the right foot so that the toe shall be about twelve inches to the rear and twelve inches to the left of the left heel, the feet at right angles. In case the formation is in double ranks, the rear rank men will only carry the right toe six inches to the left.

106. At the second command each man will kneel on his right knee, bending the left, the left toe to the front, the leg straight, the right foot nearly perpendicular, the weight of the body resting firmly on the right heel; at the same time he will drop the muzzle of his piece and support it with the left hand as above prescribed, the arm resting on the left thigh, the right hand at the small of the stock.

107. The instructor will then command:

1. **Position drill, by motion.** 2. **One.** 3. **Two.**

   4. **Three.**

   *(One time and three motions.)*

These movements will be performed as above described, except that at the command **Two**, the left elbow, supporting the rifle, will be rested upon the left knee, the elbow a little in front of the knee-cap.
108. When performing the exercise kneeling, to cause the men to resume their position in the ranks, the instructor will command:

1. **Carry.** 2. **Arms.**

*(One time and three motions.)*

109. *(First motion.)* Throw up the piece with the left hand, which will be slipped to the height of the shoulder, the right grasping it as in *Carry arms*, the butt in rear of the right thigh.

110. *(Second motion.)* Rise on both feet, at the same time facing to the front and bringing the right heel by the side of the left, lower the piece to the extent of the right arm, and press it against the shoulder as in *Carry arms*.

111. *(Third motion.)* Drop the left hand quickly by the side.

112. When the squad are familiar with the movements, and have become accustomed to the prescribed positions, they will be exercised without the motions, both standing and kneeling. For this purpose, the instructor having caused them to come to a "ready," as above prescribed, will command:

1. **Position drill.** 2. **One.**

*(One time and three motions.)*

113. At the second command the squad will proceed with the motions consecutively, observing a pause between each.
114. The instructor will habitually cause the "back sight" of the pieces to be kept upright during the "position drill," so as to observe that the pieces are not twisted to the right or left in aiming. He will also see that the men place the butts of their pieces properly and firmly against the shoulder—a habit which is indispensable to prevent the jar of the recoil; also that they hold their heads up, without attempting to aim. For this purpose, he will frequently pass down the front and rear of the line, correcting the position of each man.

115. Whenever he observes a defect upon the part of any man, he will command, "As you were," and cause him to go through the motions several times in succession to correct the defect.

116. This practice being designed to accustom the soldier to handle his rifle expertly—to strengthen his left arm so as to give him perfect command over his piece with his left hand—and to habituate him to raise it to the shoulder in the direction the eyes are fixed upon without moving the body, is to be continued until these points are accomplished. No defect, however trivial, is to be overlooked, and the instructor is to be careful to explain all errors and the bad effects which would result from them in firing with ball.
117. In performing these exercises kneeling, the men should be provided with knee-caps to protect the uniform.

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ARTICLE V.

AIMING DRILL.

118. The squad having been sufficiently instructed in the position drill, will be exercised in aiming. For this purpose, the instructor having formed them as before, with their pieces at a "carry," will command:

1. Squad, as skirmishers (standing or kneeling).
2. Ready.

(One time and three motions.)

119. (First two motions.) Assume the position of ready, standing or kneeling, as may be directed, as described in Paragraphs 97 or 105.

(Third motion.) Cock the piece with the thumb and seize it with the right hand at the small of the stock, as directed in Paragraph 98, without deranging the position of the butt.

The instructor will then command:

1. Aiming drill, by motion. 2. One. 3. Two.

(One time and four motions.)
120. At the second command, the squad will execute the first two motions of the position drill, except that now the head is bent slightly forward and to the right, without straining the neck, the left eye closed, and the right directed through the notch of the back sight, to a point about a foot underneath the bull's-eye, and the point of the foresight aligned on that spot.

121. At the command Two, the forefinger will be inserted into the trigger-guard and bent until the middle* of the forefinger rests upon the curve of the trigger. A moderately deep inhalation will now be drawn and the lungs kept inflated, the breathing being entirely restrained until the trigger is pulled. Each man will then, without further command, raise the muzzle with a steady, deliberate, perpendicular motion with the left hand only, and without moving the back till the extreme point of the foresight covers the centre of the object and is perfectly in line with it and with the notch of the back sight. At the precise instant when each man feels that the line is true, and without the delay of a second, he must pinch or press the trigger steadily and without jerk, carefully, at the same time retaining the rifle in its position, keeping

* The "end joint" in the Prussian regulations; but this does not give the requisite power as well as that given in the text, which is that directed in the English and French systems.
his eye still directed upon the bull's-eye, and observing what movement, if any, he has imparted to the piece by the pull of the trigger. The rifle will then be brought to a "ready" without further command.

122. Aiming drill, kneeling, will be performed in the same manner from the kneeling position.

123. The instructor will observe during these drills that the sights of each piece are always kept in an upright position, that the rifle is held steadily in the hollow of the shoulder, that the middle of the forefinger is on the trigger, that no jerk accompanies the pull of the trigger—the forefinger deriving no aid from the hand or arm—and that the fall of the hammer produces no deflection of the muzzle. He will instruct the men that the piece is to be controlled by the left arm alone, and without movement of the small of the back or backward motion of the body. Also that in aiming the right eye must be brought directly at a level with the two sights and glanced through them at the target; and that if it be intently fixed upon this, the muzzle sight will cover it almost without an effort, while if an attempt be made in the ordinary way to look from the muzzle sight to the object, it will not be so readily seen, and the difficulty of aiming will be greatly enhanced. He will also notice care-
fully those men who have a tendency to wink the right eye as the hammer descends, and see that they overcome it by practice before proceeding further.

124. He will cause this drill to be often practiced with the rear sight elevated, and will frequently pass down the line, correcting each man individually; and while seeing that the men do not let the piece "hang" too long when the proper sight is once obtained, will take care that they do not fire so quickly as to overshoot.

125. The instructor should impress upon his squad that, by close attention to their sights, they can tell if they lose their aim in pulling the trigger much better than if they were firing with ball cartridge, as the ball will be sure to go wherever the sights are ranged when the trigger is pressed, while in actual firing the flash and smoke prevent their knowing anything more than can be ascertained from seeing where their ball has struck. That this is, in fact (in addition to the acquiring of steadiness of motion and firmness of position), the main secret of aiming drill.

126. The position in ranks will be resumed as described in Paragraphs 103 or 108, except that at the first command, the piece will be brought to half-cock. This rule is habitual for all cases where the piece has been previously cocked.
127. The squad being well grounded in the foregoing practice will be exercised without the motions with their sights at different elevations. For this purpose the instructor will command:

1. Squad, as skirmishers, standing (or kneeling).
2. At 300 (or 500) yards. 3. Ready.

(One time and four motions.)

128. The First and Second motions will be performed as above described.

129. (Third motion.) Hold the piece firmly with the left hand, and with the right regulate the sight for the distance required.*

130. (Fourth motion.) Cock the piece and seize it at the small of the stock.

131. The instructor will then command:


(One time and four motions.)

132. At the last command each man will go through the different movements as above prescribed, performing the motions regularly (without hurry) in his own time, and returning to the "ready."

AIMING DRILL—LYING.

133. After the men have been practiced in

*This is done by the Prussians when at an "aim."
the foregoing exercises, they will be instructed in aiming lying.

134. For this purpose the instructor will cause the squad to be formed as above prescribed, and will then command:

1. Squad, as skirmishers, lying. 2. Ready.

(One time and four motions.)

135. (First motion.) Turn the piece with the right hand until the trigger-guard is to the right, loosen the grasp of the right hand, and drop the barrel smartly forward; grasp it with the left hand at the lower band; reseize it with the right below the back sight, drop the left hand by the side and straighten the right arm, the piece being horizontal, the trigger-guard to the right.

136. (Second motion.) Kneel on both knees, placing the hands on the ground on each side of the knees, instantly extending the legs to the rear, and lowering the body to the ground.

137. (Third motion.) Turn upon the left side and rest upon the left elbow, carry the piece forward and seize it with the left hand at the swell near the lower band, the toe of the butt on the ground, the thumb of the right hand on the hammer.

138. (Fourth motion.) Cock the piece and
reseize it with the right hand at the small of the stock, as previously prescribed.

139. The instructor will then command:


140. Turn a little to the left, so as to bring the body flat on the ground, curve the body very slightly to the left and the legs rather more so, raise the piece and press it firmly against the shoulder with both hands, the elbows on the ground, the left elbow nearly under the rifle, and the right rather close to the body than otherwise, the head elevated as high as convenient; and in this position aim and fire as prescribed in Paragraph 121, and return to the position of "ready."

141. The instructor will caution the men that the object of curving the body and legs to the left, is to prevent the recoil from forcing the piece against the collar-bone, and that as this recoil is felt more in this position than in any other, they should be careful to hold their rifle firmly and easily against the shoulder.

To continue the exercise the instructor will command:

1. Squad. 2. Ready.

(One time and two motions.)

142. (First motion.) Turn upon the left side,
resting upon the left elbow, bring down and carry back the piece, seizing it with the left hand at the upper band, the right thumb on the hammer.

143. (Second motion.) Cock and seize the piece with the right hand as previously prescribed.

144. To cause the men to resume their position in the ranks, the instructor will command:


(One time and three motions.)

145. (First motion.) Grasp the piece with the right hand at the lower band, turn to the left upon the belly and place the piece on the ground along the right side; place both hands flat on the ground opposite the waist.

146. (Second motion.) Rise upon the hands and instantly bringing the feet between them, straighten the body, bring the piece to the right shoulder, as in Carry arms from an order.

147. (Third motion.) Drop the left hand by the side.

148. As the position of the skirmisher lying affords the greatest safety to the men while enabling them to obtain a greater certainty in firing, they should be cautioned to adopt it in actual combat whenever practicable, when acting as skirmishers.

149. After practicing the preceding drills,
the instructor should cause the squad, after snapping the hammer and returning to the position of "ready," to go through the motions of loading before again aiming.

150. Inasmuch as correct aiming becomes impossible after the left arms of the men have become too tired to hold the piece steadily, the instructor, during the position and aiming drill, will allow them to carry their pieces when at a "ready," in an unconstrained position, without paying particular regard to the tactical position. For the same purpose he will also allow short rests from time to time, and occasionally bring the men to "attention," and exercise them in the manual or in marching.

151. He also will not insist upon the different motions being performed with the cadence required for the other parts of the manual of arms, but use them more to secure a thorough performance of his instructions, than mere mechanical uniformity.

152. Every man in these drills is to judge himself when he shall pull his trigger, and all undue precipitancy should be discouraged.

153. Although some of the prescribed motions may seem unnecessary or monotonous to the men, they must be executed precisely as directed, special care being taken to detect and correct the variations from the prescribed
motions. Steadiness of position, and particularly of the eye, head, and shoulders, cannot be too strongly insisted upon. The piece should be thrown forward smartly, yet without jerk, and always raised with a steady, perpendicular motion, the trigger being gently pressed the instant the sights are in line with the mark. If this upward motion be regular, there will be no side vibration; but if the sights are allowed to "hang" on the mark, the shooting is sure to be wide. Particular care must be taken that the barrel be not raised too rapidly. Beginners almost invariably shoot too high and to the right, from raising the rifle too precipitously, and pulling too hard on the trigger. As military rifles (particularly with the regulation charge) always shoot high, this fault should be carefully guarded against, the men being instructed to keep the eye steadily fixed upon the mark, not only before but after firing, so that they may themselves observe if the fall of the hammer deflects the muzzle, and thus guard against a repetition of the error.

154. These drills are the most important part of rifle-practice, and the most minute attention must be given throughout to every man's position, particularly to see that the sights are upright; that the rifle is pressed firmly to the shoulder with the left hand; that
the trigger is pressed steadily without the slightest motion of the hand or arm while the muzzle of the rifle is being raised and until the hammer falls; and that the eye is fixed upon the mark during and after snapping. The instructor is to scrutinize each man in succession during the time the squad is practicing, pointing out and correcting any errors he may discover. He should also occasionally place himself in front of each man, and cause him to aim at his eye with a view to ascertain if he obtains the alignment quickly and readily, and does not lose his aim in pressing the trigger.

155. The minimum number of position and aiming drills is 16 for recruits and 8 for the annual course, each to be of half an hour.

Should any recruit after having been put through a lesson once, or having been exercised through the whole course, be found unfit to practice with ball, he will be sent back to another squad to commence again.

156. Commanding officers are to make arrangement for the position and aiming drill—of which there cannot be too much if well executed—being frequently carried on by every company, under the close personal supervision of the officers, assisted by the regimental instructor, and a return required of the number of times it is performed.
157. They should also encourage the men to engage in these practices at other times than when under drill, but cautioning them against ever bringing a rifle to an "aim," unless they have first selected some object to sight it at. (See Appendix.)

158. To load with cartridge, the instructor will command:

1. **Load in three times.**  2. **Load.**

(*One time and three motions.*)

(*First motion.*) As in Paragraph 97.

159. (*Second motion.*) As in Paragraph 98, except that the thumb of the right hand will be placed on the hammer, the fingers underneath the guard.

160. (*Third motion.*) Cock the piece. Place the thumb of the right hand on the thumb-piece and open the breech-block (if there be an empty shell in the chamber it will be removed by the extractor), and carry the hand to the cartridge-box.

Handle CARTRIDGE.

(*One time and one motion.*)

161. (*First motion.*) Place the cartridge in the chamber with the thumb and two fingers; close the breech-block with the thumb (when the hammer will fall to simulated half-cock)
and seize the piece at the small of the stock with the right hand, as in Paragraph 98.

162. Should there be any difficulty in closing the breech-block, it is probable that the rim of the cartridge is too thick; it should be withdrawn and another tried.

*CARRY ARMS.*

163. As in Paragraphs 103 or 108.

164. When the men have been thoroughly practiced in the loadings by motion, the instructor will command:


165. At the second command the squad will load with the greatest promptitude and precision, without slurring over, or omitting any of the motions.

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**ARTICLE VI.**

**CANDLE PRACTICE.**

166. As soon as the men are sufficiently instructed to understand the proper method of aiming, they should test the improvement they have made by firing at candles. The explosion of an army cap will extinguish a candle at
a distance of three feet from the muzzle, if a correct aim be taken at the upper part of the wick, and a very satisfactory idea can therefore be obtained of the shooting of the squad by practising at one. For this purpose a series of candles should be placed in a socket opposite to each bull's-eye used for aiming drills, and the men drawn up in front of them in single rank, as above prescribed, and dressed so that the muzzles of their pieces when at an "aim" will be three feet from the lights.

167. If the room is exposed to draughts of air, the candles should be placed in a small box with the front and top out, and with a hook on the back to fasten against the wall. This arrangement will also prove convenient both in protecting the wall and in handling the candles.

The sergeants should be provided with means to promptly relight extinguished candles.

168. After every discharge each man who has extinguished his candle should come to a "support," and his name be checked by the commanding officer in a list provided for that purpose (Form I), each candle extinguished counting one, and a miss, zero; the aggregate score of each man being announced at the close of the firing. Not more than ten shots should be allowed at each drill—seven standing and three kneeling.
169. If the firing at these candles or with ball cartridge is not practiced immediately after an extended "position" or "aiming drill" or marching in "double time," it will be much more accurate.

170. In cases where several squads are drilling simultaneously, and it is an object to avoid the time and labor of cleaning all their pieces, a certain number may be devoted to that purpose, each squad stacking them after completing their exercise. It is preferable, however, for each man to use his own piece exclusively.

171. When the men are armed with breechloaders, cartridges containing nothing but fulminate, or which can be reloaded with the Berdan cap, must be obtained for this practice.

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ARTICLE VII.

BLANK FIRING.

172. Before the men are permitted to fire with ball, they should be practiced to fire blank cartridges with the view to give them steadiness, and accustom them to the recoil which follows the explosion of the powder.
10 rounds to be fired singly, \( \text{Standing} \)
10 rounds in file firing,
10 rounds singly, \( \text{Kneeling} \)
10 rounds in volleys,
10 rounds singly—\( \text{Lying} \).

173. The position of the body, arms, and hands, the manner of pressing the trigger and holding the head, in taking aim, should be duly watched in this exercise, in order to discern and correct those errors which are fatal to good shooting, but which cannot be so successfully corrected when firing with ball.

174. The instructor will be careful to explain that the recoil caused by the explosion of the powder is to be guarded against by pressing the butt firmly into the hollow of the shoulder. This is of great importance, as the more confidently a man "stands up to his rifle," the less likelihood there will be of random shooting, and the better the results of the firing.

175. The instructor will also make the men understand that the centre, not the toe of the butt, is to be pressed against the shoulder, as the direction of the recoil is downward, and its consequent tendency to throw the muzzle up.
ARMORY TARGET PRACTICE.

ARTICLE VIII.

ARMORY TARGET PRACTICE.

176. Firing with ball in armories is not desirable as a general thing, the conditions as to light and distance being so different from actual field practice as to render the latter far preferable. In addition, the smoke and noise in such a confined space are objectionable, and, although these can be overcome by diminishing the charge of powder used, the practice is not a good one, as it accustoms the men to a different condition of affairs from what occurs in firing in the field, which should always be with the full regulation charge.

177. Nevertheless, as many regiments of the National Guard are unable, during their drill season, to practice in any other way, and have armories of a sufficient size to afford a range of 150 feet (which, by gaslight, is equivalent to a longer range in the day-time), the following instructions have been prepared as a guide. At the same time, whenever a suitable range is available, ball practice in armories should be abandoned.

178. The best kind of target for this practice is undoubtedly an iron plate; but this, if made thick enough not to become indented, is heavy,
cumbersome, and more than all, expensive, requiring a special foundation, and to be bolted into the wall. A target almost as good, and much lighter and cheaper, can be made of pieces of joists a foot long and about four inches square, laid one upon the other, the ends resting against the wall, and held in place by an iron band encircling them, fastened by screws at the corners; the whole target presenting the appearance of a section of Nicolson pavement. Bullets striking this bury themselves in the grain of the wood without splitting it, and there is hardly any limit to the quantity that can be shot into it without injury. The target for an armory should be about eight feet high by six wide. If made of wood, the ends should be dressed to a smooth face and colored white. On this should be painted a target three feet high by two feet wide, having a black bull's-eye six inches wide by a foot high, and a centre one foot wide by two feet high, marked by a black line half an inch wide surrounding it, (being half the size of a third class target.*) The target should be well lit up, and some lights placed a little in rear of the firing point—but the fewer between that and the target the less the men will be dazzled. If the range

* See description of targets, p. 117.
is so long that a bullet hole cannot be plainly seen from the firing point, accommodations and a proper protection must be provided for a marker in the vicinity of the target.

179. To prevent stray shots, a shield may be provided about the size of the target, and having an aperture in the centre a foot by eighteen inches wide. This should be placed between the target and the firing point, at such a distance from the latter that the man standing there will see almost all the target through the hole in the centre. If necessary, a side shield can also be prepared. The thickness of these must depend upon the charges to be used. With the regulation charges, the centre shield should be of tough wood at least two inches thick, plated with sheet-iron on the side toward the target, so that a stray ball will be arrested there, after passing through the wood, without glancing. The side shield need not be so thick, nor will it require plating. If the room will admit, these can be hinged from the ceiling and arranged with a pulley to be lifted out of the way when not in use. If this is impracticable, they can stand on a bottom piece provided with rollers, and be run up against the wall when not wanted. As, however, the men firing should be confined to those who have attained some proficiency in aiming drill, and are under the
supervision of a careful officer, there will be but little occasion for their use.

180. In cases where the objection to the use of the full charge of powder are greater than its advantages, as above given, the quantity usual in loading a Colt's revolver (belt size) will carry a ball 150 feet point-blank, and avoid both the smoke and noise arising from the use of a full charge, which in a confined room is a great object. With a breech-loader, the usual charge must be used, unless special cartridges can be procured.

181. Target firing in the armory should be limited to such men as have extinguished five out of ten candles at a previous drill, whose names should be handed in to the adjutant. If possible, the firing should only take place on a night when there is no drilling going on. This list will be handed by the adjutant to the instructor detailed to command the practice squad, who should make up a roll of the men as they report and fall in. He should then (where muzzle-loaders with less than the usual charge are used) detail two careful men to load the pieces (of which not more than half a dozen will be required), and a non-commissioned officer to cap them and hand them to the men as required, and will take his place on the right of the firing party. If the usual cartridge is
used, the men will load, but not cap. Each man as his name is called will step to the firing point, take a piece from the sergeant (which will be given him always with the muzzle up and at half-cock), come to a "ready," and "aim," and "fire," without further orders. As soon as he has fired he will step back, hand his piece to one of the loaders, and resume his position two paces in rear of his previous position in the ranks. The instructor will record the shot at the same time calling off the name of the next man on the roll, who will step to the firing point, "fire," and fall back as before. When all have fired, they will be marched forward to the first position.

182. If breech-loaders are used, each man will "load" on arriving at the firing point, but no one is to be permitted to have a loaded and capped piece except the man at that point. This rule is universal, both in the armory and in field practice. A bull's-eye counts 4; centre, 3; outer, 2. Bullet holes in the target should either be painted over or covered with a white paper seal as fast as required to prevent confusion. This practice is a good preparation for field firing, in making both officers and men familiar with the details required to secure safety, together with rapidity and precision of firing.
183. Before firing, the squad should go through the aiming drill, as skirmishers, standing (Paragraph 118), several times. This rule is general in all cases of practice with ball cartridge.

ARTICLE IX.

JUDGING DISTANCE DRILL.

184. In this drill the men are taught to note the size and appearance an enemy will present at different distances.

In target practice, the distance is measured, but in action, the distance being unknown, it becomes necessary that it should be quickly and accurately estimated, for (as explained in Paragraph 67) no accuracy can be attained in firing at more than 200 yards unless the proper elevation is given.

185. Commanding officers will therefore see that, in all cases where circumstances admit, not only the men but the officers under their command, are exercised according to the following rules, and they will impress upon the latter that they should be able to correct any error in estimation which may be made by
their men, in order to enable them to conduct and regulate their fire in presence of an enemy.

186. When regiments are stationed in cities, where no facilities for this purpose can be obtained, commanding officers should encourage their subordinates to practice themselves in estimating distances in every way in their power, and should also take advantage of all excursions for target practice to instruct them in this particular.

187. The method of instruction will be as follows: The instructor will cause the company to be assembled fully equipped, as for drill, and divided at least into three squads, or as many as there are company officers present. Each officer is provided with a cord, upon which the distances will be marked in divisions of five yards.

188. The instructor will measure on the ground a right line, which will be marked off into distances—0, 50, 100, 150, 200, 250, and 300 yards, marking these distances, as measured, with a stake, stone, or line, on the ground. He will now direct each man of his squad to pace off the measured distance of 100 yards, cautioning them to be careful and preserve their natural gait without attempting to increase or diminish the length of their step, and to count the number of steps they take in pass-
ing over the distance of 100 yards. This is to be repeated at least three times by each soldier, who reports each time the number of steps taken by him in passing over 100 yards. The ratio which this step bears to a yard having thus become known, the instructor will inform each soldier the number of steps it will be necessary for him to take to pass over 10 yards. The soldier now knowing the number of steps he must take to pass over 10 and 100 yards, it will be easy for him to measure any distance with sufficient accuracy for all practical purposes when firing.

189. To estimate a distance greater than 100 yards, in steps, the soldier, having started from the point of departure, will count the number of steps he should take to pass over 100 yards; extending, as a tally, at the moment of arrival, the thumb of his right hand, the other fingers closed; he will then recommence his count, extending the first finger of his right hand when he has counted the number of steps necessary to make a second 100 yards, and so on, until he arrives at a point less than 100 yards from the point up to which he is to measure. When the soldier finds himself less than 100 yards from the object, he will count by tens, saying, "ten yards," when he has counted the number of steps necessary for him to pass over the dis-
tance of 10 yards, 20 or 30, and so on, until he arrives very near the object, when he will increase the length of his step, counting each step a yard; and by adding these to the tens, he will then only have to count as hundreds the number of fingers he has raised, to know the whole distance expressed in yards.

190. The men having thus learned to "pace off" correctly, will be practiced in judging distances.

191. For this purpose the instructor will form his squad at one of the extremities of the line, which has been measured in such a way that the line measured shall be perpendicular to the front of the squad. He will then place a man at the distances of 50, 100, 150, 200, 250, and 300 yards, facing the squad, and at an "in place, rest." The men selected should be as near the same height as practicable, and should be posted eleven paces to the right (or left, as directed) of each other, and should maintain an erect position unless otherwise directed.

192. The instructor should then call the attention of the squad to the state of the sun, the atmosphere, and the back-ground, so that they may be accustomed to the changes made in the appearance of the several objects under altered circumstances.

193. He will now direct the attention of the
squad to the different parts of dress, arms, equipment, and figure of the men on the line—such as can be easily distinguished and recognized at 50 yards, and such as cannot be readily recognized at this distance.* He questions each man of his squad on these points, not expecting all to answer alike, since the eyesight of men will generally differ.

194. The instructor will now call the attention of the men to the soldier placed at 100 yards distant, and cause them to make similar observations upon this man as those already prescribed for the soldier at 50 yards, and will again question the men.

195. He will be careful to point out to them the difference that exists between those two distances, as illustrated by the difference in the appearance of the same objects at these distances, and will direct the squad to notice that men appear smaller the further they are off, although in reality they are nearly the same height.

196. The men stationed at the different points will be frequently replaced by others, who have made their observations, for which reason the squad should consist of at least double the number of men employed as markers.

* See remarks on page 189. Appendix.
197. Should the party be very large, markers may be thrown out in opposite directions, so as to afford a view of the markers in two aspects.

198. When the men of the squad have made a sufficient number of observations upon the six distances above indicated, and when these observations are well impressed on their memories, the instructor will cause the squad to estimate intermediate distances between 50 and 300 yards.

199. For this purpose he will cause the markers to be called in and march his squad to a different part of the ground from that in which the distances were measured in the first place. He will then send out one man, directing him to halt at a given signal. The instant this man steps off, the squad is faced about, in order that the men may not count the steps taken. When the man proceeds a sufficient distance, he will be halted, facing toward the squad. The squad will now be faced to the front. The men will estimate the distance which separates them from the soldier. The instructor cautions the squad to recollect the observations made by them upon the men placed at the measured distances. He will then place himself a short distance from the squad, and call each man to him in turn, and question him as to the dis-
tance, noting down his answer, which must be
given in divisions of five yards, and in a low
tone of voice, so as not to influence the judg-
ment of others.

200. When the party is large, it will be di-
vided into squads, and the answers of the men
of each squad will be received and recorded
by the assistant instructors.

201. No talking will be allowed while the
answers are being given, and every man will
adjust the sight of his rifle for the distance esti-
imated. When all the men have given their
answers, they will be read over to them by the
instructor, who will then cause the distance to
be measured, and, at the same time, stepped
off by the men, placing himself in the centre to
count the steps. Each man having then stated
the distance as paced by him, the instructor will
insert the same by the side of the distance as
estimated, and will announce the real distance.

202. The instructor now points out to the
men what errors, if any were committed, in esti-
mating the distance. In order to do this more
distinctly, he may send a man to the point from
which the squad started, pointing out all errors
by observations on this man.

203. The instructor will repeat this exercise
as often as in his judgment is necessary, but at
not less than four drills, taking care each time to
choose a different distance, but always between the limits above indicated.

204. When the instructor judges that the men of his squad—who should, if possible, be the same during these exercises—have acquired a sufficient accuracy in estimating distances comprised between 50 and 300 yards, he will proceed to estimate distances comprised between 300 and 600 yards.

205. To accomplish this, he will cause to be measured a distance of 600 yards, and mark upon the right line, so measured, distances of 300, 350, 400, 450, 500, 550, and 600 yards.

206. He will then direct two or more men to place themselves at every fifty yards, from 350 to 600 yards, as above explained, and will cause his squad to remark upon the appearance presented by these markers, as above prescribed for distances under 300 yards.

207. In estimating distances over 300 yards, the observations should be upon groups of men which should number at least eight, and be placed in single rank.

208. For this exercise the stadometer* should be used. If there be none, a cord should be provided of the length required, divided into divisions of five yards, with the distance of each

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*See Paragraph 229.
division from the end so marked as to be distinguished on a close inspection.

Having caused this cord to be stretched in any distance that is deemed desirable, the instructor should send forward a group of markers under charge of a non-commissioned officer, who should be ordered to halt on arriving at a specified distance marked on the cord, which distance should be a division of five yards. Where the party is large, half of it may be thus sent out. On arriving at the specified point, the markers will be halted and faced, as above directed, being kept ten paces from the cord. Each officer and man in both parties will then be required to estimate the distance by their respective commanders, as above prescribed, which will be recorded and read over to them, after which the correct distance will be announced and recorded. No alteration of any answer is to be made after the correct distance is announced, and special care is to be taken that the men do not hear each other's estimates.

209. Where no cord is used, the party of markers will be halted by its commander at any distance between 300 and 600 yards; and, after the men of both parties have estimated the distance, it will either be measured by a cord and the distance announced by the drum
or bugle (a roll or long note standing for each hundred, and a tap or short note for ten), or the two squads will advance together, counting the paces, which added together will give the result. The latter is to be preferred, as saving time and walking.

210. In each practice the men are to be exercised at six different stations, which are to be alternated in such a manner as to preclude any clue to the actual distance being gained.

211. Every judging distance drill should consist of observations made upon men at known distances, and of three answers given on men placed at unknown distances immediately afterwards.

212. Estimating distances should take place under different conditions of the atmosphere—cloudy, foggy, etc.,—and, if the locality permits, squads should be drilled on ground the outline of which is diversified by hills, ravines, etc.

213. At the conclusion of each drill, the number of points obtained by each man is to be announced to the class and recorded, and the register signed by the officer keeping it and instructor. No erasure is to be made in the register, and all corrections are to be initiated by the officer making them. A neglect of this will invalidate the register.

214. Instruction will be given, if possible,
so as not to interfere with other parts of the soldier's drill. It will always, however, precede ball-practice, and be carried on during this practice, so that when one squad is occupied in firing at the target, the remaining squads will be exercised in estimating distances.

215. The preliminary course for recruits in this exercise will consist of eight drills,* four at known and unknown distances up to 300 yards, and four from 300 to 600 yards, the time being discretionary with the instructor.

216. After completing this practice, both recruits and drilled soldiers will be exercised in the annual course of judging distance for classification.

217. This course consists of three periods, each consisting of two practices, or twelve answers, which is to be annually performed by every command to keep the men in practice.

218. All will commence in the third class, and estimate as far as 300 yards, the value in answers being—within 5 yards, 3 points,

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  10  "  2  "
  15  "  1  "
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All those who make 14 points will pass into the second class.

219. The second class will estimate distances

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* See remarks, Appendix, p. 189.
between 300 and 600 yards, the value of the answers being—within 20 yards, 2 points,
   " 30 " 1 point,
when all making 14 points will pass into the first class.

220. The first class will estimate between 600 and 900 yards, the value of the answers being,
within 30 yards, 2 points,
   " 40 " 1 point,
when the man making the greatest number of points, will be the "best judge of distance."

221. After each classification, those who do not succeed in securing sufficient points, will again go through with the exercise of their class until the prescribed drills are completed; and if they succeed, on such renewed attempt, in making the necessary points, will be promoted accordingly.

222. All regimental officers are to be exercised through a course of judging distance drill, and are to practice annually with their companies; and the names of the three best judges of distance, with the points they obtained respectively, are to be inserted in the annual musketry practice return.
PART IV.

ARTICLE I.

INSTRUMENTS FOR ESTIMATING DISTANCE.

223. For estimating distance, the stadia and stadometer are used.

224. The former is a piece of copper or other material, with an isosceles triangle cut out of it. The upper and lower sides are graduated, and a slide works from left to right. The base of the opening is perpendicular to the sides of the instrument, and represents the apparent height of a man at a given distance, when the instrument is held horizontally at a certain distance from the eye.

225. In the opening, the base, when held vertically and at a distance, say 26 inches, from the eye, represents the apparent height of a foot-soldier with his cap on, at say 150 yards.

226. In order that the instrument shall always be used at the same distance from the eye, a string or chain is attached to the slide. The graduation of the sides of the instrument is
made by observation or by calculation, assuming the average height of an infantry soldier to be a certain number of inches.

227. To use the instrument, hold the knot at the end of the string, or the ball of the chain, between the teeth, stretch the string or chain by extending the arm, keeping the base of the opening vertical; pass the instrument from right to left across the field of sight, and move the slide until the figure estimated at is contained within the remaining space, and read off the distance marked on the scale.

228. This, however, like various other ingenious instruments for measuring distances, has not been found to meet the practical requirements of the service; and it is generally admitted that numerous trials and prolonged observations in the appreciation of distances, can alone form the habit or coup d'œil which enables the soldier to estimate distances with sufficient accuracy.

229. The stadometer is based upon the mathematical proposition that, in similar triangles similar sides are proportional. It is intended for the drill-ground, to save measuring in estimating distances; and as its results are certain, is a valuable instrument. It consists of a bar 5 feet 2 inches long, marked with an index having a sliding sight and a cross-head at one
end extending at right angles to its length, and is supported at a convenient height by legs at each end. Two foresights, one at two inches and the other at four, are placed on the head.

230. In using this instrument, the sight on the index bar is aligned upon the desired point. A flag is then placed at 40 yards at right angles from that point (the angle being obtained by the use of a cross staff having two sets of sights), and the sliding sight on the index bar slipped down until the foresight on the head is aligned on the flag; when the scale will show the distance, as every four inches represents 40 yards.

231. To measure over 600 yards, the inner foresight on the head is used, and the distance on the scale doubled, as at that angle every 2 inches would represent 40 yards.
PART V.

ARTICLE I.

TARGET PRACTICE IN THE FIELD.

232. Target practice affords proof of the attention bestowed upon the preliminary drills; the more carefully the latter have been performed, the better will be the results of the former.

233. The full course of this practice is—

1. Firing singly, - - 60 rounds.
2. Volley firing, - - 10 "
3. File firing, - - 10 "
4. Skirmishing (or firing at unknown distances), - 10 "

234. In addition, squad or individual practice should be encouraged as much as possible.

235. Firing at all distances up to 300 yards is to be performed standing;* beyond this, kneeling or (in the first class only), lying, if

* This is for purposes of instruction. In matches the rules of the National Rifle Association (see Appendix) govern the position.
FIRING SINGLY.

preferred. Firing from the left shoulder is not allowed, except in case of defective vision of the right eye, and not then in the volley firing.

To secure uniformity, the targets shall always be of the regulation size.*

236. In all these practices, each soldier shall load and fire his own piece, using the full charge of powder.

237. In all firings in ranks, the front rank will be made frequently to change positions with the rear rank, and, before firing with ball, the men will be briefly practised in simulated firings, when the hammer will be allowed to fall as in aiming drill.

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ARTICLE II.

FIRING SINGLY.

238. In this branch of individual firing, the recruits, during the first firing, are to fire five rounds at every 50 yards, from 50 to 200 yards inclusive, at a third-class target;† and after having passed through the course, so as to be known as "drilled soldiers," are to fire annually

* See description of targets, page 117.
† ld., page 117.
a like number at every 50 yards from 150 to 300 yards, that being the commencement of the "annual course."

239. When the squad or company has performed this "period," the points obtained by each man at the several distances will be added together, and a classification made. Those who have made thirty points are then formed into a second class, and those who have not are to fire again in the third class.

240. In the second period, the third class will practice as before. The second class will fire at a second class target; the recruits, at every 50 yards from 250 to 400 yards, and the drilled soldiers from 400 to 600 yards, five rounds being fired at each distance.

241. A second classification will then be made, and those who have made thirty points will be promoted, those of the second class into the first, and those of the third into the second, the others to remain in the second and third classes respectively.

242. In the third period, the second and third classes will practice as before. The first class will fire at a first-class target; the recruits at every 50 yards, from 450 to 600 yards; and the drilled soldiers, from 650 to 800 yards—five rounds being fired at each distance. A final classification will then be made in each class,
and all who have made thirty points in the first class will be designated as "marksman," and those who have made a like number in the second and third classes, will be promoted as above prescribed.

243. A list of each company, arranged in classes, will be kept in its quarters until new lists are formed at the next annual course.

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ARTICLE III.

VOLLEY FIRING.

244. In this practice, ten rounds of ball ammunition are to be expended by the recruit, and once a year by the drilled soldiers of every company at 400 yards, both ranks kneeling.

245. It should be observed, however, that this is but an occasional practice in the course of instruction, and one of the last taken. While valuable to accustom the men to delivering an effective volley, it does not assist learners in marksmanship, and should be avoided, except with those who have passed through the course.

246. The targets used for this as well as for "file firing" practice, are composed of six targets placed close together, across the centre of
which is to be colored a black mark two feet deep. This constitutes the "bull's-eye," the "centre" being the space one foot above and below the bull's-eye, and the "outer" the remainder of the target.

247. The strength of the firing squad in this and the following exercise, should not exceed twenty, nor be less than five men.

248. In the volley firing, if a man's rifle misses fire, he is not to fire at the target singly. Every miss-fire in a volley is to be counted as a round expended. No man is to be withdrawn from the practice after having commenced it; and whatever may be the result of the fire in each volley, the average to determine the result of the practice is to be ascertained by dividing the number of points (obtained by the hits on the target) by the number of men in the squad.

249. In the "volley" and "skirmishing" practicing, care is to be taken that the men of the third class who have not fired beyond 300 yards, adjust their sights to the proper elevation.

250. In this and all other firing in ranks, the men will be made to take the positions laid down in the "School of a Soldier," as applicable to those different firings. They will also be accustomed to regulate the sights in ranks, putting in practice as much as possible, when
firing in ranks, what has been prescribed for individual firing.

251. The proper execution of "volley" firings, depends in a great degree upon the commands of the officer. If he does not allow a sufficient interval between the commands "Aim" and "Fire," the men will not have time to aim and to obey the command properly, the trigger will be pulled too suddenly. The result will be, that much of the efficacy of the fire will be lost, and a simultaneous fire, upon which a great deal depends, will not be obtained; for experience and reasoning demonstrate the fact, everything else being equal, that platoon-firing is more effective in proportion as it is executed together.

252. When the officer leaves a suitable interval between the commands "Aim" and "Fire," the men have time to adjust the piece to the shoulder, to place the finger in front of the trigger, and to exercise a slight pressure on the trigger when awaiting the command "Fire." They are then ready to fire the moment the command is given, thus obtaining a simultaneous and effective fire.

253. But, if the officer superintending the firing should be careful to leave a sufficient interval between the commands "Aim" and "Fire," he should no less avoid the other extreme. If he keeps the men aiming too long, they will...
become fatigued, will lose their aim, and will not be able to obey the command when given.

254. It is only by commanding, and seeing platoon and company firing executed with ball-cartridge, and judging of its effects by the number of balls put into the target, that officers can appreciate the influence of a command properly given, and acquire the habit of thus giving their commands.

255. When firing by file or by volley the officers will indicate in their command the distance which separates the company from the object to be fired at, as soldiers in ranks are necessarily more or less constrained in their movements, and being occupied, moreover, in loading their pieces, may not be able to judge correctly the distance which separates them from the enemy.

256. The most suitable moment to indicate the distance, will be immediately before the command "Aim" is given, as the men will then be in a position to regulate the sights. To direct the fire of a company upon an enemy, for example, at 400 yards, the officer will command:

1. Fire by company. 2. Company. 3. Ready.
ARTICLE IV.

FILE FIRING.

257. The object of this exercise is to accustom the men to such use of their arms as would be required in the ranks in actual combat, and to combine rapidity with accuracy—the latter, however, never being sacrificed for the former.

258. The firing in this drill is at 300 yards, and the men are not to be allowed (after they have been well drilled in the preliminary course) to elevate the back sights of their pieces, but are required to estimate the necessary elevation, the aim being taken through the flanges.

259. This firing will be conducted according to the tactics in all respects.

260. Ten rounds should be fired in this practice as rapidly as consistent with accuracy, and at least once a year, provided the men have attained any proficiency in firing singly.

261. The time required to perform it should be reckoned from the command, "Commence firing," and should be noted on the face of the return.*

262. In this practice, the distance will be

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* With practice, 12 to 13 rounds a minute can be fired with the Remington rifle, loading from the cartridge-box.
announced immediately before the command "Commence firing," and after the command "Ready."

263. When firing in the open field, at ranges beyond 300 yards, and at all distances where firing from behind parapets or under cover of any sort, the back-sight is to be carefully adjusted, and a true alignment taken through the notch upon it, at the object aimed at.

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ARTICLE V.

SKIRMISHING, OR FIRING AT UNKNOWN DISTANCES.

264. Ten rounds of ball ammunition should be fired by the recruits who have gone through with the course, and annually by the drilled soldiers of every company, in skirmishing order, according to the tactics; five rounds in advancing from 400 to 200 yards, and five in returning from 200 to 400 yards, each man judging his own distance and arranging his sight accordingly; and also taking advantage of any cover afforded by the ground, as if in actual battle.

265. In this practice, six or eight single targets should be placed with intervals of six
paces between them. Each target is to have on it the "bull's-eye," "centre" and "outer" marked as on the targets used for volley firing. (Paragraph 246.) Every file is to have its own target.

266. In advancing, the men may fire kneeling, rising to load, which may be executed with muzzle-loaders at a halt, the men running up to the file-leaders after returning their ramrods, and capping when coming to a "ready." In retiring, the firing is to be invariably delivered from the knee.

267. In this practice, a sentry (one of the fatigue party) is to be placed on each flank of the extended targets, about 40 or 50 yards off, to prevent any person approaching within that distance.

268. In all ball practice the instructor should caution the men that accuracy of fire is to be preferred to rapidity, and should use special pains to cultivate deliberation in firing, and the avoidance of all waste of ammunition.

269. For this purpose he should impress upon them that in aiming at over 400 yards, they should select large bodies, artillery or columns, in place of single objects, and that at all distances they should aim chiefly at the enemy’s officers, and at those bodies of troops which, though more distant, are most distinctly visible.
270. The officers and non-commissioned officers should be careful in service to control the firing of the men by directing the elevation and part of the body to be aimed at (as "At [so many] yards." Head, or Waist), as well as to indicate the direction and strength of the fire, and the objects which most deserve the attention of the troops.
PART VI.

ARTICLE I.

PERIODS OF DRILL, AND CLASSIFICATION OF MERIT.

271. The following table exhibits the minimum number of drills required to be performed by recruits, and also by each drilled soldier in his annual course.* In addition, advantage should be taken of all available occasions to have the men review the exercises they have performed.

272. No effective man is to be exempted from performing this course. If he be reported by the surgeon to be unable to see up to 300 yards, he will be required to practice at shorter distances. Excusing men from practice, only leads to malingering.

*See Appendix, page 141.
<table>
<thead>
<tr>
<th>PRELIMINARY DRILLS</th>
<th>RECRUITS.</th>
<th>DRILLED SOLDIERS.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drills.</td>
<td>Time for each drill.</td>
</tr>
<tr>
<td>Cleaning arms</td>
<td>4</td>
<td>½ hour.</td>
</tr>
<tr>
<td>Theoretical drills</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Sighting drills*</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Position and aiming drill</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Snapping caps (5 each drill)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Blank firing (10 rounds)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Judging distance</td>
<td>8</td>
<td>Time discretionary with officer.</td>
</tr>
</tbody>
</table>

**PRACTICES.**

| Target practice, 5 rounds each, distance (commencing at 50 yds†) | 12 | Discretionary with officer. |
| Firing 1 round from rest at each distance to 300 yds | 5 | 50 to 200 yds. |
| 1st period, 3d class | 4 | 50 to 200 yds. |
| 2d                 | 4 | 250 to 400 yds. |
| 3d                 | 4 | 250 to 400 yds. |
| 1st period         | 4 | 450 to 600 yds. |
| Volley firing, 10 rounds | 1 |               |
| File firing, 10 rounds | 1 |               |
| Skirmishing, 10 rounds | 1 |               |
| Judging 1st period | 2 | to 300 yds. |
| Distance 2d        | 2 | to 600 yds. |
| Drill              | 2 | to 900 yds. |

* When at aiming drill, those not actually engaged, are to be exercised in position drill, with sights fixed for the actual distance, so as to employ the time profitably.

† Recruits shoot at but two distances in one day, and are not to fire over 10 rounds a day.
273. The number of points to be obtained as a qualification to pass from one class into another, both for recruits and drilled soldiers, is as follows:

274. **Target Practice**, (each class firing five shots as prescribed in Article II, pages 85 and 86.)

For the third class to pass into the second class, 30 points.

For the second class to pass into the first class, 30 points.

**Judging Distance** (two practices or twelve answers at each period).

Third class to pass into the second at least 14 points.

Second class to pass into the first at least 14 points.

275. All soldiers who shall, in shooting in the first class in the annual course, have obtained at least 20 points, and are in the first class in judging distance, shall be styled "marksmen," and are entitled to wear a badge of *cross muskets, worked in gold, on the sleeve*; but they can only retain this badge by maintaining their efficiency at each annual course. Any man who begins to fire at one or more distances with his company, and is unable to complete the "period," is to be considered as having completed it.
276. If, after having fired one or more rounds at a distance, a man becomes unable to complete the practice on account of illness, he is considered as not having fired at that distance unless the points obtained pass him into a higher class.

277. In case of the weather preventing a squad or company from finishing a practice, it is to be completed at a subsequent occasion.

278. Men who remain in the "third class" at the final classification, are to be subsequently exercised in the entire course in every respect as recruits, but it is to be distinctly understood that this additional practice is not to be looked upon as a punishment, or deprive them of any indulgences.

279. The "figure of merit" by which to measure the efficiency of any organization, is formed as follows:

1. Average points obtained in the first period.
2. Average points obtained in volley firing.
3. Percentage of first-class shots at final classification minus the percentage of third-class shots.

280. The following table shows what averages may be considered as indicating very good, good, moderate, and bad shooting.*

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* These averages are those of the English musketry regulations of 1868. Since that time they have been raised 25 per cent., as the troops have acquired greater skill, and a similar change will undoubtedly have to be made here after a few years' practice.
<table>
<thead>
<tr>
<th></th>
<th>Very good</th>
<th>Good</th>
<th>Moderate</th>
<th>Bad when under</th>
</tr>
</thead>
<tbody>
<tr>
<td>First period</td>
<td>40</td>
<td>36</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Volley firing</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Excess of 1st class over 3d class</td>
<td>40</td>
<td>30</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Figure of Merit</td>
<td>100</td>
<td>80</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Independent firing (with breech-loaders) time under two minutes</td>
<td>18</td>
<td>15</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Skirmishing</td>
<td>12</td>
<td>9</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>
PART VII.

ARTICLE I.

PRACTICE AT RIFLE RANGES.

281. To secure safety and avoid delays and errors in marking, it is important that the regulations for the use of a range should be carefully prepared, and not only understood by all those intending to practice, but strictly enforced.

282. In cases of practice by a regiment or a number of squads, the entire management of the targets and markers should be previously committed to a single officer, who should be held responsible for the arrangements and for all delays or errors on the ground. Where the men are inexperienced in rifle practice, it would be well to print all the regulations for firing in the Regimental Order, so that the entire command may understand previously what is to be done.*

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* For regulations for practice upon a range by individuals, see Appendix, page 141.
283. Before the firing commences, the markers and look-out men should be posted, and a large red flag hoisted upon the flag-staff in the range. These men should be detailed beforehand, and marched to their positions as soon as their party reaches the ground, to avoid the delay arising from making and instructing a detail upon the ground. Proper reliefs should also be provided and posted promptly.

284. Printed orders should be furnished to both officers, markers, and look-out men, at the time they are detailed, in the following form, and care be taken that such orders are understood.

ORDERS FOR THE SENIOR OFFICER AT THE FIRING-POINT.

285. Not to allow any practice to take place until the large red flag is hoisted on the main signal staff, and the sentries or look-out men are posted, to prevent persons from crossing the range and give notice of danger.

286. To inspect the markers and register-keepers before they take their places, and see that they are provided with all requisites and properly instructed.

287. To see that the markers and sentries are properly instructed in time, and that they are afforded an opportunity of firing.
288. To see that the men load properly.
289. In all important competitions, to see that each man's trigger is tested at least once during the practice.
290. To see that the squads firing are properly equalized.
291. Not to allow a man to fire until the shot of the previous man (should it strike the target) has been signalled.
292. To order the "Cease firing" to be sounded, and the "danger" flag to be hoisted at the firing-point, immediately the red flag is raised from the marker's butt, or any person or animal appearing in front of the firing party, and on no account to allow any firing to proceed so long as the danger flag is up at the marker's butt. When this flag is lowered, to order the "Commence firing" to be sounded, and the "danger" flag at the firing-point to be dropped.
293. On the ranges, situated in pairs, to see that the parties fire by classes, at the same distances, and not one class in front of another.
294. When the "Cease firing" sounds, to see that the firing at all the ranges which are occupied in pairs is discontinued until the "danger" flag at the marker's butt is lowered, and the "Commence firing" is again sounded.
295. To see that all persons who desire to watch the practice, stand to the right and clear of the party; and on no account to allow any noise or talking among the men, whose attention should be fixed on the practice.

296. To be most particular that the men keep their places in the ranks while the practice is proceeding, to allow no irregularity, and to be alert to prevent accidents.

297. To see that the proper flags are used by the markers.

298. To use his best endeavors to prevent delays, and forward the progress of the firing.

ORDERS FOR THE MARKERS.

299. To see on taking their places that they are properly supplied with flags or disks, brushes, paint, etc.

300. Not to allow any practice to take place until the large red flag is hoisted on the long signal staff in a conspicuous place, and the look-out men are posted to warn persons against crossing the range.

301. To see that the following flags or disks are raised to signal the position of the shots which strike the target, and the "ricochet and danger," or "Cease fire."

1. White flag or black disk, - outer.
2. Dark blue flag or red disk, - centre.
3. Red and white flag * } - bull’s-eye.
or white disk, 

4. Red flag waved horizontally twice to and fro, in } - ricochet.
front of the target,

5. Red flag, - danger, and cease firing.

302. To see that the signal flags are invariably waved when the wind blows directly up or down the range; and (where Hill’s mantlet is not used) whenever a shot strikes the target to the right of the centre, that the flag denoting its value is inclined to the right, and vice versa; also, when a shot strikes the target high, that the flag is high as possible, and upright; and when low, that it is raised only high enough to be easily visible above the butt; and when using the disk, that it is placed immediately in front of the hit on the target, putting it first to one side in the case of an outer.

303. To see that the “danger” flag is hoisted whenever it is necessary to cease firing, to recolor the target, or for any other purpose; and to allow no one on any account whatever, to leave the marker’s butt until the “Cease fire” has been sounded, or the “danger” flag has been raised at the firing-points in answer to the “danger” signal; also to see that the red

* This should be so constructed as to avoid any liability of its being confounded with the “danger” signal.
flag is kept up (and waved so as to attract attention) so long as the markers are out of the butt, or any person is in the line of range.

304. To see that the "danger" flag is lowered directly the range is clear.

305. To allow no person to enter the marker's butt, except those on duty, without an order from the senior officer on the range, nor to allow any one to enter or leave the butt except by the regular path.

306. That the marker in the ricochet butt calls out to the markers at the target "Ricochet," whenever a shot strikes the ground before reaching the target.

307. To check all talking or noise in the marker's butt.

308. To see that the "danger" flag is hoisted and shaken about immediately, any of the lookout men either hoists his flag or gives notice that persons or boats are within the line of fire, and that it is kept up until the range is clear, and the look-out man lowers his flag.

309. When the firing is at long range, to see that all persons in the marker's butt stand as close as possible to the slope most distant from the target, to avoid the chance of being struck by the bullets when falling.

310. At the first signal to "Cease firing," to put out the "danger" flag, but not leave the butt.
At the second signal, to place their flags, etc., in the proper place, fall in, and return to their command.

311. To report all damage done, or repairs necessary for firing disks, flags, etc.

ORDERS FOR LOOK-OUT SENTRY.

312. To look out carefully, and the instant any person or animal appears at . . . . going towards . . . . or along the shore (when firing seaward), coming from . . . . , to hoist the red flag and call out to the non-commissioned officers in the marker's butt, in a loud voice, "Danger," and to keep his flag flying until the said person has passed to the . . . . (according to the direction in which he is proceeding). The same precaution to be observed in respect to boats passing close in-shore in the line of range.

313. To give notice to all persons who may be about to pass the range, that they are in danger while the firing is going on, and to signal them back.

314. To call out to the non-commissioned officers in the marker's butts "Ricochet," whenever a shot strikes the ground, before reaching the target.

315. To watch for the danger-flag at the firing-point, and immediately it is hoisted to call out to the non-commissioned officers in the butts "Flag up."
316. In the performance of his duty (more particularly during the execution of the platoon and skirmishing practices), to keep as low as possible to avoid the risk of being hit by a ricochet shot.

317. To return to his command at the second signal of "Cease firing," as prescribed for the markers.

318. The marker in the butts, and one of the men in the ricochet butt, are invariably to be non-commissioned officers of a different company from that engaged in firing. The former is to be responsible that the correct signals are given to the several shots which strike the target, and is to keep a memorandum of each shot fired, under the head of "bull's-eyes, centres, outers, ricochets, and misses," to facilitate the marking, and ensure each man's shot receiving the correct signal.

319. The firing parties should not consist of more than twenty men each, and only one squad should be allowed to practice at a time for each target available. Such detailed arrangements should be made as will ensure the various squads arriving on the practice-ground by the time those firing have finished their practice, and thus prevent delay. When exercising by classes, if there be a choice of time for practice, the senior class is always to have the advantage.
320. The men's names are to be entered in a register before going to the practice-ground, in the order in which they stand in the ranks. One register will answer for each section or squad, to record the performances at four distances.

321. During the practice, an officer or non-commissioned officer is to keep the register, and note therein opposite each man's name (which he is to call out before he fires), the number of points obtained by each shot.

322. All entries during competitions or practice for final classification should be made in ink on the practice-ground; should any alteration become necessary, a fine line is to be drawn through the figure or letter, and the correction made, the initials of the company officer keeping the register being immediately attached to it (thus, 3 : A. L.), to verify the circumstances. Inattention to this regulation or an erasure (which is prohibited), should invalidate the register. This rule should be adhered to in all matters to prevent complaints.

PRACTICE.

323. As soon as the company is on the ground, and the markers posted, the officer will cause the first class, formed in two ranks, to take position ten steps in rear of the point
from which the firing takes place, the centre of the rank on and perpendicular to the plane of fire, and will put them through the "aiming drill," three or four times (without the motions).

324. The remaining classes will be divided into as many squads per class as there are intelligent non-commissioned officers available, and the squads, superintended by an officer, will be exercised on suitable ground near the firing-point, in estimating distances.

325. The officer will then (if the men are armed with muzzle-loaders) command, "Load at will—Load," cautioning the men that they are not to cap their pieces, and then bring them to an "Order arms." "In place—Rest." If breech-loaders are used, no order to load need be given.

326. He will also direct each man to have a cap (or cartridge, if breech-loaders are used) ready when his name is called, so that there will be no delay at the firing-point—a point to which too much attention cannot be paid.

327. When everything is ready the officer will direct the drummer or bugler (who is to be placed on the right of the firing-point) to sound the "Commence firing;" and so soon as the "danger" flag is lowered at the target, he will order "First File—Forward," when each file in succession, commencing from the
right will place themselves on a line two paces to the front and one pace apart. The front rank man will then "load" and "fire," and the rear rank man will do the same so soon as he sees that the shot, if a hit, is signalled. They will then fire alternately until they have expended the prescribed number of shots, when they will "carry arms," and move by the right flank and place themselves three paces in rear of their former positions in the ranks.

328. If muzzle-loaders are used, the officer will command "Number One—Forward," and the men will step forward singly, commencing at the right, "cap" at the firing-point and "load" on taking their position in the rear. The men must have their caps or cartridges ready when it is their turn to fire, to avoid delay.

329. By observing this rule the whole squad, after firing one round, will have re-formed three paces in rear of the original position, to which it is to be again moved, by the officer in charge, when the loading and firing are to proceed as before.

330. The officer (or instructor) is to be cautious not to check a man for any error at the time he is firing, as it would have the effect of distracting his attention from the object he is aiming at; but he is to watch attentively the position of each soldier, and to correct him, if necessary, after he has fired.
331. Where the hits on the target are not obliterated as the firing proceeds, the target is to be recolored whenever they become too numerous to easily distinguish the new ones as they strike.

332. Before this takes place, however, the officer of the firing squad, and the "marker," are carefully to compare the register with the target to see that they agree, and the officer is to satisfy himself that the target is properly cleaned, and all the old shots obliterated before the practice is resumed.

333. At the conclusion of the practice, at a "distance," the points obtained by each man are to be totaled and read out, after which the "Cease firing" is to be sounded, when the officer of the squad is to proceed to the target, and, with the "marker," compare the register therewith, adding or deducting from the "total points" any difference that may be discovered.

334. Should a man mention, when his "total points" are read over to him, that the number is wrong, and specify at the time the particular hit recorded in error, è. g., an "outer" for a "centre," and should it be found, when comparing the register with the target, that there are on the latter more hits of the value claimed than are noted in the former, the officer keeping the register is authorized, under these cir-
cumstances only, to credit the man with the additional number of points.

335. The register is, at the conclusion of each of the two practices, to be signed by the "marker," and countersigned by the officer of the squad; after which the column "duplicate total points" is to be initialed by the officer or his assistant, to verify the agreement with the column "total points," and then torn off and handed to the adjutant for regimental use. The officer is responsible that this order is attended to in all cases.

336. All persons watching the practice are to stand to the right of the firing-point. They are to be kept clear of the section that is firing, and on no account is any noise, or talking with the men, to be allowed.

337. Whenever a bullet strikes the target, so that the circumference of the mark cuts the outer edge of the bull's-eye or centre, such shot is to be counted, in all practices, as hitting the bull's-eye or centre, as the case may be. No shot is to be counted in any practice where the mark of the bullet, in part or the whole, is not seen on the face of the target.

338. The signal for "danger" or "Cease firing" is in all cases to be a red flag. This will be hoisted whenever it is necessary to cease firing, to re-color the targets, or for any other
purpose. No man is on any account to leave the marker's butt until the "Cease firing" has been sounded, or the danger-flag raised at the firing-point in answer to the "danger" signal.

339. The red flag is always to be kept up as long as the markers are out of the butt, or any person is in the line of range.

340. Whenever the "Cease firing" is sounded from the firing-point, it is to be immediately answered from the marker's butt by raising the "danger" flag; and in like manner the "Commence firing" is to be answered by lowering it. On no account is a shot to be fired when the danger signal is up at the marker's butt.

341. When the markers are sufficiently near the target, the flag or disk shown will be placed over the bullet-marker. In other cases whenever a shot strikes to the right, the flag indicating its value is to be inclined to the right, and vice versa. When the shot strikes high, the flag is to be raised as high as possible, and when low, it is only to be raised high enough to be easily visible.

342. As before stated, the bullet will be found to make a very distinct mark, so that the correct position of each shot is easily seen at a short distance.

343. Hits on the target are to be indicated by flags of different colors raised above the butt,
or by disks placed in front of the hits, where Hill’s manlet butts are constructed. These flags and disks, together with the number of points fixed as the value of the hits, are as follows:

<table>
<thead>
<tr>
<th>SHOTS</th>
<th>FLAGS</th>
<th>DISKS</th>
<th>VALUE IN POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer</td>
<td>White or Yellow.</td>
<td>Black</td>
<td>2</td>
</tr>
<tr>
<td>Centre</td>
<td>Dark Blue.</td>
<td>Red.</td>
<td>3</td>
</tr>
<tr>
<td>Bull’s-eye</td>
<td>Red and White.</td>
<td>White.</td>
<td>4</td>
</tr>
<tr>
<td>Ricochet*</td>
<td>Red waved in front</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>of the target.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miss</td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

344. The practice is confined to five shots at each distance, and not more than twenty shots a day. Recruits are only allowed to fire at two distances in one day.

*Ricochets, or shots which strike the ground before hitting the target, are to be signalled by waving the red flag twice, to and fro, in front of the target, and are to be counted as misses in individual firing, but noted in the register by the letter R. As these shots make an oblong mark on the target, the outer edge of which is an ellipse, while a direct shot makes a star, they can easily be distinguished.
PART VIII.

ARTICLE I.

TARGETS.

345. The regulation size of a single target should be six feet in length by two in breadth. If possible, it should be constructed of iron of sufficient thickness to be rifle-proof, having squares of six inches cut on the face to facilitate the marking off of the hits on diagrams provided for the purpose, and also to serve as guides in painting the bull’s-eyes and centres.

346. They are colored white with a mixture of whiting, water, and size, prepared as follows: Put two quarts of whiting free from lumps into a vessel, adding enough water to make it moist, then dissolve one pound of patent size by heat, and, when fluid, add it to the whiting, stirring it
round and thinning it with water, so that, when cold, it will be of the consistency of paper-hanger's paste.

347. This, if put on warm, will not blister or fly off when struck by shot, and, on a wet day, the target will remain much whiter, as the size prevents it washing off.

348. The "bulls-eye" and the lines describing the "centre" (which are not to exceed half an inch in width, or to pass beyond the indented lines on the target) are to be colored black with lamp-black, water, and size, prepared in a similar manner. Pots of these paints should always be kept near the targets.

349. All iron targets are placed upon a wooden platform (twenty feet by nine inches), set at right angles at line of fire, and braced from the rear. When in use they are to be as perpendicular as possible.

350. Care must be taken to prevent injuring the targets in lowering or raising them, and on no account should they be allowed to fall. They should be periodically painted, and when laid down should be placed on an incline, to prevent the rain lodging on them.

351. No attempt is to be made to measure any "string" of the shots made; therefore, to insure either correctness or comparison of records, the regulation size of targets should be strictly
adhered to, although different materials may be used in their construction.

**SIZES AND CLASSES.**

352. The targets are divided into

**FIRST, SECOND, AND THIRD CLASSES,**

which are made by uniting the necessary number of single targets.*

353. The following is the regulation size of targets for military instruction: †

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**THIRD CLASS.** Two targets. Bull's-eye, 2 feet high by 1 foot wide; centre, 4 feet by 2 feet. This is used by recruits at from 50 to 200 yards, and by drilled soldiers from 150 to 300 yards.

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*In matches, a smaller bull's-eye is used. See rules of National Rifle Association, Appendix, page 185.

† The size of the Third Class target has been increased, and the shape of the bull's-eye changed since 1867.
SECOND CLASS.—3 targets.
Bull's-eye, 2 feet by 2 feet; centre, 4 feet by 4 feet. Used by recruits at 250 to 400 yards, and by drilled soldiers from 400 to 600 yards.
First Class.—4 targets. Bull's-eye, 2 feet high by 3 feet wide; centre, 4 feet by 6 feet.

Used by recruits, 450 to 600 yards, and by drilled soldiers from 650 to 800 yards.

354. A fatigue party of at least six men should be detailed daily, during the practice, under the charge of an officer, to fix and clean the targets, act as look-out men, and perform such other duties as may be required.

355. As a bullet striking an iron target is apt to "splinter," it is necessary that the markers should be either placed in a pit some distance to its front, or else be provided with some special shelter.

356. The main point to be desired in erecting targets is, to so place the markers as to enable them to at once observe every bullet striking the target, and to signal and erase it without delay, and with safety to themselves.

357. The best scheme for these purposes is what is known as

HILL’S MARKING BUTT AND MANTLET.

This consists of a shot-proof hut, erected on the side of the target, away from the sun (so as to avoid casting a shadow upon the target itself), which has on the side towards the latter a window of \( \frac{1}{2} \)-inch plate-glass, and has also a narrow slot, 2 inches in width, extending down...
that side in front of the window, to a point 3 feet 6 inches from the top.

358. The marker is able to see through this window every shot that strikes the target (a distinct mark the size of the ball being produced), and is protected by the glass from flying splinters. He is furnished with a series of disks (Paragraph 360), having a paint-brush attached to their reverse side, and fastened to a long handle which passes through the slot cut in the side of the mantlet. By placing the disk over the mark of the shot it is obliterated with the brush, at the same time that the result is signalled to the firing-point by the disk itself.

SCOBLE'S MARKING BUTT.

359. The following is a description of the method of preparing the marker's pit, used in The Ontario Rifle Association of Canada.*

Excavate a trench 5 feet deep, 6 feet wide at top, 4 feet wide at bottom, with a drain 1 foot deep, leaving a bank for a seat 1 foot 6 inches from floor, and 1 foot 6 inches wide. Wall inside with 2-inch plank, securely spiked to 4-inch by 6-inch scantling placed 4 feet apart, well sunk into the ground at bottom, and held apart at top by 2-inch by 8-inch joists well spiked on.

* The author is indebted for this description to Lt. Col. T. C. Scoble, the Secretary of The Ontario Rifle Association.
Lay a roof of 2-inch plank over these joists; at opening, E, frame in a window of 1-inch plate-glass 12-inch by 24-inch, and hinge to lower edge of floor (or roof) a lifting trap-door made of a single plank 16 inches wide (D), shutting over with a bevel edge on to the sleepers for the target platform. Trap to be provided with a 4-foot lever handle strongly bolted through plank, and provided with a counterweight (F), sufficiently heavy to balance trap when up. The target platform (B) to be of 12-inch by 12-inch timber (oak if possible), chamfered off at front upper edge, resting on shingles (C) of 4-inch by 4-inch scantling placed 4 feet apart and solidly bedded in bank. A strip 1-inch by 3-inch to be nailed on to platform in rear of target. The earth, taken from excavation to be thrown in front and rear of target platform, and well stamped and riveted with turf. There must be at least 4 feet of earth in rear of the marker's butt. Entrance into butt from a trap-door at one end. Butts for 1st class targets must be 12 feet; 2d and 3d class targets, 8 feet long. The cost of these butts, excavated in sandy soil, and using pine lumber, at say $12.00 per M, is about $20.00 each—not including the glass, which costs about $3.00 per window. This glass is made by the Lenox Manufacturing Co., Lenox Vale, Mass., and is perfectly transparent.
360. The disks consist of circles of No. 24 sheet iron, 2 feet diameter for 1st class, 1 foot 6 inches diameter for 2d and 3d class targets. These are let into handles 1½ diameter, sawn down at one end to receive them. When Hill's mantlet is used, the handles are, for second class, for an outer, 12 feet 6 inches; centre, 10 feet 6 inches; bull's-eye, 8 feet 6 inches; for third class, for an outer, 8 feet 6 inches; centre, 7 feet 6 inches; bull's-eye, 6 feet. When the Scoble or any other pit system is used, the handles may be shorter as 8 feet for 2d and 3d class, and from 8 to 10 feet for 1st class targets. They are painted black for "outers," red for "centres," white for "bull's-eyes." A brush (No. 20), with 4-inch handle, is fixed through centre of disk, and being full of paint obliterates the mark of the shot while indicating its position.

361. By either of the above methods it is impossible for a mistake to be made in marking, from there being but one shot made on the target at a time, and no time is lost in "washing out;" while under any other system where the markors have to leave their cover to obliterate the bullet-marks, accidents unfortunately will occasionally happen.

362. When iron targets can not be obtained, and only the third-class size are required, the
following style, devised by the author, may be used, being cheap, easily transported, and found to work well in practice. It will, however, probably be too cumbersome where more than four feet in width is required.

THE REVOLVING TARGET.

363. This consists of two targets six feet long by the requisite width, placed end to end, and composed of a light frame-work covered by half-inch boards, on which is tacked a piece of white pasteboard of the size required for a centre with the bull's-eye painted on it.

364. In using this target the marker's pit should be about eight feet long by four wide, and be dug where the target should be placed. If this is upon a side hill, five feet will be deep enough, if the dirt be thrown towards the firing-point so as to make an additional cover. If the ground is level, the dirt should be thrown the other way, and consequently the pit should be a foot and a half deeper.

365. In shooting, when much of any elevation is given, the pit should be a little deeper and the markers be directed to keep as far away from the target-edge as possible.

366. A beam having been placed at the rear of this pit so as to project some six inches over the rear edge, the centre of the targets is fas-
tened to the end of it, with a screw passing through the division line so as to permit them to revolve, the other end of the beam being pinned down to the ground. If the targets are placed so as to overhang a bank, the beam can be put in front of them; but in that case it should be sunk below the level of the ground, as a bullet will often strike it when above, and mislead the markers.

367. By this system one target is exposed to view while the other is in the pit. When a shot is fired the markers, being directly in front of the target, know from the sound whether it has struck. If it has, one of them at once turns the target, which brings the one with the shot-hole into the pit, and raises the other into its former position. He then covers the shot-hole by pasting a paper seal (such as are used by notaries) over it, while his companion elevates the proper flag to signal the result of the shot, the firing proceeding without interruption.

368. By use of this target there is no occasion for the markers to lift their heads over the level of the ground, and but little opportunity for errors in marking. A set of flags or disks should be provided for each target, as above prescribed.

369. Where either of these targets are used,
Ricochet butts are not required, as the markers being so near the target can distinguish them by their making a different mark from a fair hit. In other cases a shelter should be provided 95 yards from the target, in which a marker should be placed to signal those shots which strike the ground and ricochet.

FRAME TARGETS.

370. When larger targets are desired, a frame may be made, composed of four pieces of wood 6 inches wide and one inch thick, the ends of the vertical side projecting about a foot below and sharpened.

371. This frame may be covered with thin boards or muslin, and held in place by four guys fastened to the top and attached to pins in the ground in the front and rear. Shot-holes are to be covered by pasting seals or patches of paper, which strengthen and thicken the target so that it will last longer than would be expected.

372. In using this target the markers will be placed in a pit at its foot. After every five shots they will hoist the danger signal, and then rise and obliterate the shot-holes, firing only being permitted when the flag is down.

THE WOODEN TARGET.

373. A target has also been used in the rifle
matches in New Jersey, resembling that of the English, with the exception that it was of boards nailed on uprights; they also followed their plan of placing the markers in a pit 15 feet to the front. While this would do well enough with iron targets, where a bullet makes a distinct mark, and the marker is obliged to keep out of the way of its splinters, when made of wood the bullet-hole is so small that he is constantly obliged to stop the firing so as to go to the target to ascertain where the shot struck, thereby causing great delay and incurring considerable risk.
PART IX.

ARTICLE I.

RANGES.

374. The first point to consider in regard to a range is its safety, and too much pains cannot be taken in the selection of the ground in order to protect the public from danger, as well as to prevent unnecessary expense in the erecting of butts, etc.

375. While it is impossible to lay down precise rules for every feature of a country, the following suggestions will be found sufficient under ordinary circumstances.

376. No ground is to be selected which does not afford a range of at least 300 yards, and it is is most important that the ground behind the targets should be thoroughly commanded
from certain points sufficiently clear of the line of fire to ensure safety to the look-out men who are to be placed there in order that the firing may be easily stopped when necessary; hence a range down-hill is generally to be preferred, as being more easily commanded, to one up-hill.

377. The targets upon a range should be established by pairs, with an interval not less than ten yards between each target, and with a margin of at least 40 yards at the sides; the minimum breadth of ground for a pair of targets should be 90 yards, and all the targets should be on the same line.

378. When, however, the number to be exercised in rifle-practice is large, and the breadth of ground limited, three or four targets may be established, with an interval of 10 yards between each, to be used, as if for a pair, a margin being left at the sides of the outer targets of at least 40 yards. In these cases the number of each target should be conspicuously placed upon the butt in rear of it so as to be plainly seen from the firing-point, and the firing should be stopped at all the targets whenever the danger signal is shown at any of the set.

379. The breadth of ground in rear of the targets at each side of the outer ranges, should gradually increase from 40 to 80 yards, when the ranges are parallel; but when they con-
verge towards the targets, the breadth may or may not be required, according to the degree to which the ranges are made to converge. The distances at the targets must never be less than 10 yards between ranges in pairs, and eighty yards between pairs of ranges, whether they are laid out parallel to each other or converge towards the targets.

380. If no butts are erected, and the ground is level, the space behind the targets should be about 1,500 yards. A less distance may, however, answer, if butts are erected, or if a steep hill rises in rear of the targets. Before steps are taken to procure ground for ranges, it is essential to secure the right to fire over the land behind the targets to the extent required, should it not be desirable to purchase it.

381. Generally, this distance cannot be obtained, and a butt must be erected in rear of the targets, to arrest stray shots. The height of this must differ according to the nature of the back-ground. If the range be on a plain, the regulation size of the butt is from 45 to 50 feet high, provided the distance behind the target is less than 1,500 yards. Under ordinary circumstances, however, the height of the butt need not be more than 20 feet, and when firing towards water, a butt of 12 feet in height will be sufficient.
382. On some ground there are found natural butts for the targets to rest against. To be of use in stopping stray bullets, and thereby ensure the safety of the public, the hill should be at an angle of 45° at least; if at a smaller angle than this, it would, instead of acting as a stop, incur the chance of a ricochet, and therefore be unsafe. A few furrows from a plow will frequently lessen the chances of ricochets.

383. The length of the butt for a pair of targets, should not be less than 45 feet, measured along the top.

ARTICLE II.

SCREENS.

384. In crowded localities where the range is short, and the danger of injury to the public great, a series of shields or screens may be thrown across the practice-ground at different distances, containing apertures of such a height and width as to permit the passage of all properly-directed bullets, and to arrest random shots. These are sometimes high arches of cast-iron, and sometimes upright
barriers of stout plank. Two or three sheds with plank roofs, made to slope towards the target, form a cheap and convenient screen, provided the ground between them is furrowed so as to prevent the ricocheting of the bullets which strike the sheds and glance downwards.

385. In the longer ranges, these shields are objectionable, not only because the high trajectory of the bullet makes it difficult to place them properly, but because they confine the firing to a single distance, and render the appearance of the target as visible through the apertures so different from what it presents in the "open" as to deprive those using them of many of the advantages that should be derived from target practice, and particularly from acquiring a practical knowledge of distance.

386. If care be taken that none be allowed to practice with ball who have not been through a course of "position and aiming drill," the danger of random firing will be reduced to a minimum, and the prescribed butt be found amply sufficient for all practical purposes.

387. Every range is to be carefully and accurately measured, and the distances defined by a line of small pegs, at intervals of 50 yards, commencing at 100 yards from the target, and continuing to 900 yards, or to the extent of the ground if under that distance.
388. To avoid the sun, the targets must be placed at the northern end of the range; or if that is not practicable, at the eastern.

389. In using the ranges the firing parties commence their practice close to the targets and gradually retire. Consequently, as there is not likely to be as much practice at the extremely long ranges as at the shorter ones, a piece of ground may be selected for an extensive range, which is of a triangular shape, the targets being placed at the broadest part, and the firing-points being reduced as the distance is increased.

390. Several flag-staffs should be placed in such positions upon the range as to make the danger signal so conspicuous when hoisted upon them as to give notice to all passers-by that firing is going on. Smaller flag-staffs should also be provided at each look-out station. A danger flag should also be provided for each firing-point, to be elevated in answer to the danger signal, as hereafter explained.

391. Several flags should be erected above the top of the booth in rear of the targets during the practice, to show the direction of the wind.

392. A wooden socket should be set in the ground in front of each target, in which the marker should place the staff of his danger-flag when obliged to leave his mantlet for any cause.
ARTICLE III.

Articles Required for Range.

The following is a list of the articles required for practice upon a range by a single regiment:

Iron targets, 6 feet by 2 feet, complete* ........................................... 3
Flags (when used), Red, 6 feet square (for flag-staff) ......................... 1
  " " Red, 3 feet by 4 feet (danger) .................................................. 4
  " " Red and white, 2½ feet square ................................................. 4
  " " Dark blue, 2½ feet square ...................................................... 4
  " " White, 2½ feet square ............................................................ 4
Poles—lance, 10 feet long ...................................................................... 22
Disks (when used), Red flag, 6 feet square (for flag-staff) ................. 1
  " " Red disk, 2 feet 6 inch square (24 gauge sheet iron) ................... 4
  " " Red disk, 2d class, 18-inch in diameter; 3d class, 9-inch ............. 4
  " " White disk, 2d class, 18-inch in diameter; 3d class, 9-inch .......... 4
  " " Black disk, 2d class, 18-inch in diameter; 3d class, 9-inch .......... 4
Poles, 1½-inch for 2d class; for outer, 12 feet 6-inch; centre, 10 feet 6-inch; bull's-eye, 3 feet 6-inch .................................................. 22
Poles, 1-inch for 3d class; for outer, 8 feet 6-inch; centre, 7 feet 6-inch; bull's-eye, 6 feet ............................................................... 22
900 yards Gunter's chain or cord, labelled every 5 yards, and numbered from 1 to 900, divided into 18 equal parts .................. 1
Pins of stout wire, 12 inches long .................................................. 18
Stadimeter complete, with 20 yards of chain, cross-staff and tripod for stand ................................................................. 1
Tripod rests with rings ................................................................. 13
Sand-bags, bushel ........................................................................ 12
Large brushes for coloring targets, 1 lb ...................................... 4
Small brushes for coloring target (sash tools) ................................ 4
Whiting, fine, without lumps (annually) ........................................ 1 cwt.
Lampblack .................................................................................. 15 lbs.
Glue, to make size ....................................................................... 42 lbs.

* These targets are joined together to make the size prescribed for the different classes.
APPENDIX.

NATIONAL GUARD PRACTICE.

To many of the National Guard, the full annual course prescribed in the foregoing Manual may appear too formidable to be undertaken. This difficulty, however, will be found to greatly diminish if not disappear, so soon as emulation becomes excited upon the subject; as the high standard of intelligence existing among the National Guard, will enable them to supply many deficiencies of the annual course, and by private practice in "position" and "aiming drill," to fully earn the honors of "marksmen." In fact, it is stated on good authority, that "one hour a day of this private practice will, in a few weeks, make a man a first-class shot."* The members of the National Guard should also bear in mind that, both in England and Canada, the volunteers have been found

to shoot better than the regulars—emulation and intelligence supplying the place of practice.

TARGETS FOR PRIVATE PRACTICE.

For private practice in "aiming drill," the following diagrams will be found valuable, as representing the different sizes of targets at different ranges. They should be in the possession of all who desire to excel, and may be drawn separately and pinned to the wall opposite a window. For standing position, the 3d class should be 4 feet 6 inches from the ground, and the 2d and 1st class, for kneeling and lying down, 2 feet 6 inches, and 1 foot respectively.*

<table>
<thead>
<tr>
<th>1st Class.</th>
<th>2nd Class.</th>
<th>3rd Class.</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 13 off</td>
<td>650</td>
<td>At 12 off</td>
</tr>
<tr>
<td>&quot; 14 &quot;</td>
<td>700</td>
<td>&quot; 15 &quot;</td>
</tr>
<tr>
<td>&quot; 16 &quot;</td>
<td>800</td>
<td>&quot; 16½ &quot;</td>
</tr>
<tr>
<td>&quot; 18 &quot;</td>
<td>900</td>
<td>&quot; 18 &quot;</td>
</tr>
<tr>
<td>&quot; 20 &quot;</td>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>

*These targets have been designed to represent the "Match targets" used by The National Rifle Association, and are smaller than those prescribed for military practices, at page 117.
When it is considered how slight a variation in the direction of the muzzle of a rifle will send a bullet a long distance from the target, and that the extent of this deviation increases with the distance, many may be inclined to despair of ever being able to attain sufficient steadiness to enable them to make such a score as to entitle them to be called "marksman."

This difficulty, although certainly existing, is, however, more imaginary than real. In fact, when it is considered how exactly the sights must be aligned upon the target to prevent missing it altogether, the accuracy which is attained is surprising. So far, however, from it being more difficult to make a good score at long than at short ranges, the contrary is very frequently the case.

In ranges under 300 yards, the shooting must be "off-hand," which requires a close union of hand and eye, together with a quickness and steadiness of nerves which many do not possess. In shooting over that distance, on the other hand, the rifleman is allowed to kneel or lie down, and by this not only obtains a more deliberate aim, but secures a position so much more immovable than when standing, as to more than make up for the difference in distance.

This is clearly shown by the following three
highest scores, made in the contest at Wimble-
ton, in 1871, for the International Cup (value
£1000).

\[
\begin{array}{cccc}
\text{200 yards} & \text{Total} & \text{500 yards} & \text{Total} \\
\text{Gray (Scotland)} & 3433432 & 22 & 0323344 & 19 \\
\text{Cooper (England)} & 3332344 & 22 & 343343 & 23 \\
\text{Downes (Ireland)} & 2233422 & 18 & 3344343 & 24 \\
\end{array}
\]

\[
\begin{array}{cccc}
\text{600 yards} & \text{Total} & \text{Grand Total} \\
\text{Gray (Scotland)} & 3344422 & 22 & \text{..............} & 63 \\
\text{Cooper (England)} & 343340 & 20 & \text{..............} & 65 \\
\text{Downes (Ireland)} & 4032488 & 19 & \text{..............} & 61 \\
\end{array}
\]

which, so far as the first (off-hand) distance is
concerned, the author has seen equalled by
officers of the National Guard, and that, too,
with a Remington military rifle having a trig-
ger-pull of at least 15 pounds. At the same
time, it will be seen that at 500 and 600 yards,
the scores are very nearly as good as at 200.

The table given on page 99 shows what
average is considered good, fair, and poor shoot-
ing; while to show what is done, it may be sta-
ted that at the prize matches at Wimbleton, in
1869, it appears from the list of winners that
Private Ingram made seven consecutive bull's-
eyes at 800 yards; Sergeant Snelus made 81
marks out of a possible 84; Captain Fenton 51
out of a possible 60 at 1,000 yards; Quarterm-
aster-Sergeant Newell 19 out of a possible 20
at 500 yards; and 25 out of a possible 28 at 600
yards; Sergeant McCling 16 out of a possible
20 at the same distance.
For the Queen's Prize (a gold medal and £250) shot for at 800, 900, and 1,000 yards, the highest possible score being 84, of forty-seven contestants, about two-thirds made an average of over 50, the best being 71, and the worst 35.

This shooting, it will be recollected, was all required to be done with military rifles, having open sights, and triggers having a pull of six pounds, Lord Elcho being himself excluded for having a rifle with an easier pull.

To further encourage beginners, they should understand that the English authorities state officially that the system described in this work, if followed with moderate industry and diligence, will enable the learner to hit a three-feet bull's-eye at 500 yards with but little more difficulty than he experienced in the first instance in striking a third-class one at 150 yards. And as a further example of the rapid improvement arising from this method of instruction, it is officially reported that thirty volunteers who had appeared at Hythe without previous instruction, were allowed to fire three rounds at a target 8 by 6 feet at 600 yards, and only succeeded in making 18 hits. They were then put through a single course of the preliminary drill, and, under the same circumstances, made 30 hits, showing that their efficiency had nearly doubled.
DISTANCE DRILL.

There is no portion of rifle practice more important than understanding how to estimate distance; but the question of how such a knowledge shall be acquired and imparted, forms a very difficult problem for an officer of the National Guard. In the country facilities for the purpose can be easily obtained, but in the cities, officers, in addition to taking advantage of every field-day, or excursion, for practice for this exercise, must urge their men to accustom themselves to judge distances the best way they can, and impress upon them that no matter how accurate marksmen they may be at a fixed target, they are worthless if they cannot calculate the distance of an enemy.

In estimating distances, the following suggestions may be valuable: At 50 yards the observer can name any one of his comrades readily, as the age, complexion, height, and figure can be determined at that distance.

At 100 yards he should notice those parts which are clearly visible, and his attention drawn to the indistinctness of other portions. The lineaments of the face are no longer visible, the buttons down the front of the coat appears one continuous line. The movements of the men individually, and the form and color
of the uniform, are, however, perfectly visible. At 225 yards, the colors of the uniform, cartridge-boxes, etc., are still visible, but the face now resembles a light-colored ball under the cap. At about 250 yards he can distinguish only the different parts of the body and the rifle. At about 450 yards, the direction of the line of march and the movement of the rifles can be detected, and in cavalry, the helmet, cuirass, bright colors of the uniform, etc. At 600 yards the head looks like a small round ball, and the shoulders sloped off. At 700 or 800 yards, the body has a dwindled appearance, but the legs of men in motion or extended arms are still distinguishable. At 900 and 1000 yards, the separate files and direction of march are still apparent. At 1200 yards, infantry can be distinguished from cavalry. At 2000 yards, a man or even a horse looks like a mere speck or dot.

The main drill of the National Guard (in the cities at least) must of necessity take place in their armories. Officers should, therefore, devote all available time to the sighting, position, and aiming drill, which form the foundation for the whole system. As these are apt to prove monotonous if protracted, candle-practice should be frequently indulged in, as this portion of the drill is always found interesting by the
men. It is, therefore, recommended that the men should be practiced in firing at candles at the conclusion of each aiming drill.

With men of the intelligence of those composing the National Guard, the improvement that will be found to result from a little careful practice of this description will be found surprising; and a company that at the beginning could not extinguish more than two or three candles at a volley, in two or three months will put out nine out of ten; and in most cases those who had the least previous practice as sportsmen will prove the best shots.

This (candle) practice will also prove valuable as a substitute for ball-practice in judging the efficiency of the men in those cases where the latter can be had; and none should be practiced in target-firing who have not averaged extinguishing five out of ten candles at a previous drill.

INDIVIDUAL PRACTICE AT RANGES.

Individual practice should be encouraged by all officers (Paragraph 234), and particularly in the case of the National Guard, to whom every inducement should be made to visit any available range for private practice.

To prevent accidents and ensure the enforcement of the prescribed rules, every man should be required to enter his name on arriving at
the range; those first arriving to have the right to choose the distance at which they wish to fire. As the men arrive, they will form themselves into squads, each squad electing a captain, who will keep the score and enforce the rules of the range. All arriving subsequently are to obey his orders. If no markers or look-out men are employed, each captain must make a detail from his squad for such purposes, and see that those detailed are properly relieved.

The firing is to be conducted according to the principles above laid down, and every shot fired in rear of the firing-point, whether accidentally or otherwise, unless fired into the pit provided for the purpose, shall be entered as a miss. The men last at the ground must see that the danger-flag is hauled down, and the appurtenances belonging to the range replaced where they belong, or returned to the keeper.

Regulations adopted by the National Rifle Association to govern all competitions in marksmanship. Approved by the Adjutant-General, June, 1872.

1. General Regulations.

I.—All competitions upon the grounds of the Association shall be conducted under the direction of the Executive Committee, composed
of the Officers of the Association and two of the Directors.

II.—Competitions occurring in other parts of the State, shall be under the direction of a Committee of the Local Rifle Association, or, if no such Association exist, of a Committee appointed by the Division Commander of that District.

III.—In the conduct of the meetings, the following regulations are to be observed, together with such other directions as may be given from time to time by the Executive Committee, or Committee in charge.

IV.—All members of the National Guard competing for prizes restricted to that organization shall appear in the authorized full dress or undress uniform of their Regiment.

V.—Competitors shall submit their rifles and ammunition for inspection whenever required.

VI.—No hair triggers shall be allowed.

VII.—No fixed artificial rests shall be allowed, unless otherwise specified.

VIII.—In muzzle-loading competitions the competitors may wipe out or clean out their rifles during any competition, provided they do not delay the squad by so doing. In breech-loading competitions this shall not be allowed.

IX.—No two competitors in the same squad shall shoot with the same rifle.

X.—No one shall be allowed to join a squad
after the commencement of the second competitive round.

XI.—No post entries shall be made for any competition after the firing for such competition has commenced.

XII.—Every competitor shall enter and shoot under his own name, and, unless otherwise specified, not oftener than once for any prize.

2. DISQUALIFICATIONS AND FINES.

XIII.—Any competitor who fires in a name other than his own, or fires twice for the same prize, shall be disqualified from ever competing at the Prize Meetings of the Association, or for any prize offered to the National Guard elsewhere.

XIV.—Should a competitor lose his register ticket, omit to take it to the firing-point, or fail to attend at the prescribed hour, and so by his own neglect miss the opportunity given to him of competing for the prize for which his ticket was issued, his claim in regard to such competition shall be canceled.

XV.—Any competitor who shall be detected in an evasion of the conditions prescribed for the conduct of any prize, shall be disqualified from further competition during the meeting, and forfeit his entrance fees, and in case of such conduct being considered by the Execu-
tive Committee as "discreditable," he shall be disqualified from ever again competing at the N. R. A. Prize Meetings.

XVI.—Any competitor who has once joined his squad, and shall leave it to fire a shot from any other firing-point before the squad has completed its shooting, shall be disqualified in that competition.

XVII.—Any competitor refusing to obey any instructions of the Executive Committee, or their deputies, will be immediately ruled out of all further competition.

XVIII.—The range being, for the period of the matches of the Association, handed over to the charge of the Executive Committee, any person not a competitor, interfering with any of the firing squads, and annoying them in any way, will at once be expelled from the ground.

XIX.—Any competitor infringing any of the preceding regulations, being guilty of unruly or disorderly conduct, or being intoxicated, shall be ruled out and forfeit any entrance fees he may have paid.

XX.—Any competitor firing when the danger-flag or disk is shown at the target or firing-point, or discharging his rifle except at a target to which he has been assigned, or into the pit provided for that purpose, shall be debarred from all further competitions during the meet-
ing, and shall forfeit his entrance fees. This shall not apply to a competitor accidentally firing at the wrong target when no danger-flag is up.

XXI.—Any person discharging a rifle or snapping a cap within the enclosure, except in accordance with the Regulations for shooting, may, at the discretion of the Executive Committee, be required to leave the ground.

XXII.—Any competitor "snapping a cap" or "firing off" a charge without going close up to and pointing his rifle into the pit provided for that purpose, shall be fined one dollar.

XXIII.—Any competitor or other person found with a loaded rifle, except on the range and within the hours of shooting, may be debarred from further competition during the meeting.

XXIV.—In National Guard and Remington All Comers’ Competitions, any competitor using any ammunition other than such as is issued from the N. R. A. Magazine, or in any way tampering with the ammunition so issued, shall be disqualified from competing for any prizes during the meeting.

3. Return of Entrance Fees.

XXV.—1. Competitors who are prevented from being present at the meeting shall have
the entrance fees they have paid returned after the meeting, provided that they send their tickets and give written notice to the Secretary before the day on which the prize for which they have entered has been announced for competition.

2. Competitors prevented from competing by illness will receive back their entrance fees in full on production of a medical certificate and their entry tickets.

3. The Executive Committee reserve to themselves the right of allowing or rejecting, subject to a reduction of half forfeit of entrance fees, claims based on any other considerations than those above specified, provided that in all cases written application, accompanied by the entry tickets of the claimants, be made to the Secretary before the day on which the competition for the prize or prizes in question has commenced.

XXVI.—Entries for the State prize shall under no circumstances be returned.

4. Prize Winners.

XXVII.—All winners of prizes shall apply to the Secretary for a certificate, which they must give up on receiving their prizes.

XXVIII.—All money prizes shall be paid on the ground.
XXXIX.—The Executive Committee will not hold themselves responsible for any prizes left in the exhibition tent at the conclusion of the meeting.

XXX.—The regulations for any public presentation of prizes, will be announced during the meeting.

XXXI.—No prize winner, being a National Guardsman, shall receive his prize at the distribution of prizes unless in the full-dress uniform of his regiment.

XXXII.—A deduction of 10 per cent. shall be made on all money prizes, pool and sweepstakes moneys, not claimed within one month after the conclusion of any Prize Meeting; and all prizes, pool, and sweepstakes moneys not claimed by the 30th of November in each year, shall be forfeited to the Association.

5. Distances and Targets.

Distances.

There shall be nine distances for individual shooting, viz.:

<table>
<thead>
<tr>
<th>Distance</th>
<th>200 yards</th>
<th>500 yards</th>
<th>800 yards</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>600</td>
<td>900</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>700</td>
<td>1,000</td>
<td></td>
</tr>
</tbody>
</table>

And one for volley firing, 400 yards.

Targets.

1. The size of the targets shall be—
RULES OF NATIONAL RIFLE ASSOCIATION.  149

a. Up to 300 yards, - 6 ft. x 4 ft.
b. Over 300 to 600 yards, 6 ft. square.
c. Over 600 to 1,000 yards, 6 ft. x 12 ft.
d. At 400 yards for volley firing, 6 ft. x 12 ft.

2. In competitions for individual firing, the size of the bull’s-eyes and centres shall be—
a. Up to 300 yards, bull’s-eye, 8-inch square; centre, 2 feet.
b. Over 300 to 600 yards, bull’s-eye, 2 feet square; centre, 4 feet.
c. Over 600 to 1,000 yards, bull’s-eye, 3 feet square; centre, 6 feet.
d. 400 yards, volley, bull’s-eye, 2 feet high and extending across the target; centre, 1 foot above and below bull’s-eye, outer, remainder of target.

In all cases bull’s-eyes shall count 4; centres, 3; outers, 2.

6. MARKING.

The marking when signalled shall not be questioned, but should the officer in charge of a firing party receive reasonable evidence that a shot has struck the target, and has not in any way been marked, he will signal to the non-commissioned officer in the butt to examine the target. The result of such examination as signalled by the non-commissioned officer shall be final.
In volley and breech-loading competitions, when the number of hits counted on the target exceeds the number of shots fired, the value of one centre (three marks) for every such hit in excess of the number of shots, shall be deducted from the total score.

7. **Rifles.**

The rifles shall be classified as follows:

*Class I.*

Springfield or Remington rifles of *bona fide* regulation pattern, as issued.

1. Minimum pull of trigger, 6 pounds.
2. Sights strictly in accordance with regulation pattern.

N. B.—They may be blackened; but white, red, or other coloring matter shall not be allowed.

3. Any pad or shoe for the heel-plate of the butt admitting of removal and thereby allowing of variation at pleasure in the length of the stock, shall be disallowed.

*Class II.*

"Any rifle;" maximum weight, 10 pounds.

1. Sights of any description, except telescope, magnifying, and front aperture sights, such as solid disks or bushes pierced in the centre.
8. Ammunition.

1. In all competitions restricted to members of the National Guard and Remington All Comers, none but the regulation ammunition similar to that issued from the N. R. A. magazine shall be used. The ammunition so issued shall in no way be tampered with.

2. In other competitions, unless otherwise specified, any ammunition may be used.


1. For National Guard Prizes, the shooting up to 300 yards shall be standing. At distances above 300 yards, it shall be in any position. By "any position," is meant, any position that a person would be able to take on level ground.

N. B.—In shooting standing no objection will be made to the elbow resting against the body, provided that the little finger of the left hand is in front of the projection in front of the lock plate, or to the position of the fingers of the right hand, provided the regulation position is preserved in other respects.

2. For All Comers' Prizes, the shooting shall, unless otherwise specified, be in any position.

3. Sighting shots may be fired in any position.
10. ORDER OF SHOOTING.

1. In all competitions restricted to the use of breech-loading rifles, the competitors shall fire their sighting and competitive shots consecutively.

2. In other competitions, the competitors shall fire their sighting and competitive shots alternately.

11. SIGHTING.

1. Two sighting shots shall be allowed to every competitor at each distance.

2. These shots shall be fired in order, when the squad is formed, and at the target about to be used in the competition. No sighting shot shall be allowed after the squad has commenced the competition; nor shall any competitor using a muzzle-loader, be allowed to fire two sighting shots consecutively, unless he be the only one present.

3. Any competitor joining the squad when the first round of sighting shots has been fired, shall be restricted to one sighting shot.

4. Competitors who, at gun fire, have not completed the number of rounds prescribed by the conditions of a competition, shall be allowed one sighting shot when such competition is resumed.
12. Ties.

Competitors who have to shoot off ties shall be notified in such manner as shall be decided by the Executive Committee at each meeting. Ties shall be decided as follows:

A.—In individual shooting.

1. In the second stage of any prize.
   By the aggregate scores made in first stage; if still a tie, by firing three shots consecutively at longest range until the tie be decided.

2. In other competitions, when the firing shall take place at more than one distance—
   a. By the score made at the longest distance, and if still a tie, and there be three distances in the competition, by the score at the second distance.
   b. By the fewest misses.
   c. By the fewest outers.
   d. If still a tie, by inverse order of shots counting singly from the last to the first.
   e. By firing single shots at the longest range.

3. In competitions for rapidity, by dividing the prize.

B.—In Matches.

a. By the aggregate scores made at the longest distance in the competition.
b. By the fewest misses.
c. By the fewest outers.
d. By the competitors who have made the highest score on each side, firing five rounds at the longest distance in the competition.

C.—In Volley Firing.

a. By the fewest misses.
b. By the fewest outers.
c. If still a tie, If the prize be in money, by dividing the prize; if it be a challenge plate, by awarding the prize to be held for equal periods of the year by the successful organizations.

N. B.—When ties are shot off, one sighting shot shall be allowed.


A.—For the State Prize.

1. For the State prize every company and independent subdivision of the National Guard shall be entitled to send two of its members as competitors; and in every regiment the Commanding Officer may, in addition, nominate
sufficient numbers from the regiment at large to make a "team" of twelve.

Field and other officers are eligible for the regimental nominations.

2. Where any company does not nominate its full complement of representatives, the vacancies may be filled by members of other companies in the same regiment.

3. In all cases representatives for the State prize must be members in good standing of the regiment from which they obtain their nomination.

4. The entrance fee for each representative for the State prize, shall be one dollar.

And such payment shall entitle them to two sighting shots at each range without further charge.

**B.—Mode of Entry.**

1. The names of all competitors for the State prize must be sent to the Secretary by the commanding officer of each regiment proposing to be represented, at least two days previous to the match, together with the amount of their entrance fees.

2. All competitors for other prizes who shall enter their names and pay their entrance fees to the Secretary by or before six o’clock of the evening previous to the commencement of the match for which they desire to shoot, shall be
squad, and notice given as long as possible before the competition, of the hour when their squad will start. Other entries will be charged 25 per cent. extra as post entries.

3. No post entries shall be made for any competition after the firing for such competition has commenced.

C.—Issue of Register Tickets.

Each competitor upon entering his name and paying his entrance fee, will receive a register ticket, under the following conditions:

1. That should a competitor lose his ticket, omit to take it to the firing-point, or fail to attend at the hour detailed by the executive officer, and so by his own neglect miss the opportunity given to him of competing for the prize for which his ticket was issued, his claim on the Association in regard to such competition shall be canceled. (Gen. Reg. XIV.)

2. That the holder of a register ticket may sell or transfer his ticket to another person, provided that he has not already missed his time for firing—that the register side is in the same condition as when issued from the N. R. A. Office—and that the person to whom the ticket is transferred shoots at the time detailed on the ticket, and in his own name.

3. That when once a name is entered on the
register side of the ticket, it shall only be used by the person bearing that name.

4. That any erasure or substitution of one name for another, shall render the ticket invalid.


1. The competitors will be told off into divisions.

2. In the competition for the State prize, squads in each division will be formed as nearly as possible of members of the same corps.

3. For other prizes, they shall be formed in the order in which the entries are made.

4. The hour at which each division shall fire will be determined for the first day by lot; on other days, by varying the time as equitably as possible.

5. Competitors selected to shoot in any match, as representatives of their companies, who find that such public engagement will interfere with their shooting in other competitions, must at once communicate with the Executive Committee, and these cases will be provided for, when possible, by altering the hour of their private engagement, and when that cannot be done, the entry money will be refunded.

15. Post Entries.

1. Post entries will be squadded on the
ground and assigned at the time of entry; and for all such, double entrance fees shall be charged.

2. They may be ordered to fire whenever target accommodation can be provided.

3. Should the holders of Post Entry tickets be precluded from competing by deficiency of target accommodation, their entrance fees will be returned to them; the Executive Committee not being able to guarantee accommodation for all such entries.


The decision of the Executive Committee upon the award of prizes, or on any point of dispute between competitors, shall be final and binding on all parties subject to the power of the Executive Committee, or any two of them, at their discretion, to refer any question to the decision of the Board of Directors, whose decision on such question shall be final.

By order of the Association,

GEO. W. WINGATE,
Secretary.
SUGGESTIONS TO MARKSMEN.

CLOTHES.

The selection of clothes to be worn in rifle-shooting, is of no small importance.

In military practice, the uniform is always required to be worn and kept buttoned; but care should be taken to have it as easy as possible, particularly about the throat and arms. Whether wearing a uniform or plain clothes, it is necessary that they should be comfortable, and not too fine. Full-dress uniform, or any clothes that the sun, wind, or a little mud will injure, are out of place upon a rifle-range. In the spring and fall, good heavy clothes and boots should be worn, as no one can expect to shoot well if shivering with cold. For this reason an overcoat or rubber cape is frequently desirable.

POSITION.

The best position to be selected in individual shooting is one that admits of considerable discussion.

In shooting "off the shoulder," the position described at Paragraph 97 should be adhered to. Some riflemen of experience, however, throw the right elbow directly to the rear, elevating it at the same time so as to bring the
wrist near the cheek, claiming that it balances the piece. It is doubtful, however, whether such a position is practicable except in a shooting gallery.

Some, on the other hand, consider it to be an improvement to throw the weight of the body principally on the left foot so as to take up the recoil, and to hold the head as far back as convenient from the sights to make them appear more distinct.

The beginner should, however, be careful to deviate as little as possible from the prescribed position, and never without good grounds. In nine cases out of ten he will lose more than he will gain by experimenting. In shooting "off-hand," there is no objection, under the rules of The National Rifle Association, to resting the elbow against the body, provided that the little finger of the left hand is in front of the projection in front of the lock-plate; neither is there any restriction as to the position of the fingers of the right hand, provided the regulation position is preserved in other respects.

When "any position" is allowed, the riflemen may shoot standing, kneeling, sitting, or lying; but after having once tested and become satisfied as to the position best suited to himself, he should practice it until it becomes perfectly
natural and easy, and should not attempt anything unusual, especially in a match, as it will have a tendency to unsettle the mind and create a want of confidence, which will assuredly tell on a promising score.

In the kneeling position, some place the elbow on the knee; others, just behind it; and others, again, just in front of it.

The latter method, which is the one recommended, is considered decidedly preferable, as it secures a hold on the knee, preventing any tendency to slip, and enables one to shoot better than by obtaining a support only for the elbow. This is not, however, the best position for shooting at long ranges; for, although admirable for military purposes, from the rapidity with which a soldier can change his position, load, fire, etc., steadiness depends on too many parts of the body. Lord Elcho, at the spring (1869) meeting of the National Rifle Association, of which he is President, stated his belief that this position would shortly be abolished, and the lying-down position permitted in the 2d class competitions. It was impossible, he said, to help thinking that, now that troops are armed with breech-loaders, it would be something like murder to allow men ever to come within range in such exposed attitudes as standing or even kneeling.
The proper mode of shooting sitting, in which position many succeed tolerably well, is with the left leg in line with the target and the right almost at right angles to it. The elbows are placed just inside the knees, and the body leaned slightly forward. With a small elevation to sit on, the position is greatly improved.

Last, but not least, is the lying down, or, as it is sometimes termed by the Scotch, "Deer-stalking" position, which the author not only considers himself to be the best, but which the experience and advice of many celebrated marksmen unhesitatingly pronounce to be the position par excellence. Although to some it may be constrained at first, a little practice will soon overcome this difficulty.

In lying down, the recoil is heavy, the body being immovable. To avoid this, many use a small pad, pocket-handkerchief, or small piece of sponge, etc., under the coat, which, especially with those of spare habit or delicate constitution, will soften the kick sure to accompany a heavy charge or loose hold.

The natural tendency of the elbows to gradually separate when firing lying, especially when they are wide apart, can be prevented by punching a small hole in the ground for each elbow with the heel of the boot.

This position is particularly useful where
breech-loading rifles are used, there being no necessity to expose oneself for even a moment, and it enables advantage to be taken of any little inequality in the ground, stones, stumps, etc., which, if only two feet square, would completely screen the marksman from the enemy's observation—the puff of smoke being the only indication—and prevent many well-directed and well-intended bullets from taking effect. In addition, as the position is both secure and steady, it enables a good shot to deliver his fire at longest ranges with telling effect.

Those desiring to make a good score will do well to have the triggers of their pieces "eased up" a little, provided it can be done by a competent gunsmith and without injury to the lock.

While in the preceding rules the pull of the trigger is limited to three pounds, this is confined to "small bores" or "sporting rifles," and is too easy for a military rifle. These should require a pull of between six and seven pounds; but when, as in many instances, particularly in new guns, they run up to ten, twelve, or even eighteen pounds, it takes an experienced hand to shoot well with them. Many of the new Remingtons, although wonderfully well sighted and carrying a ball with almost the precision of a sporting rifle, yet require such undue expenditure of strength to
start the trigger as makes accurate shooting quite difficult.

All riflemen should be particular to never put a cap on the nipple or load a breech-loader until prepared to fire; for accidents have happened, and will happen, even with the most careful. If the rifle is loaded, keep it at "half-cock." Some, who ought to know better, keep the hammer down on the capped rifle, alleging it is safer; such may be their opinion, but experience teaches us that "half-cock" is the proper position for a capped rifle, and attendance to this would have saved many a life in days gone by.

AIMING.

It will generally be found that a certain blur exists in aiming, particularly at long ranges.

Various descriptions of sights have been devised to remedy this evil, but without any very great success, as it arises mainly from the impossibility of keeping the eye in focus for the sights and a distant object at the same time. Particular attention must, therefore, be paid (as previously explained) that the eye be directed at the mark instead of being fixed at the sights and glanced from them to the target.

Many good shots hold that first sight is the best. Probably for "off-hand" shooting it is, if it is a good sight. No one, however, should
at any time pull his trigger unless he is satisfied he has taken a correct sight, unless it is at game "on the jump." If he has not a satisfactory sight he had better try again, if his target will wait. In shooting in any other position than "off-hand," nothing can be better than to follow Mr. Russell's advice. He says: "My practice is first to get into a comfortable position for the body, then to bring the rifle to bear at the spot I have chosen to aim at; think of any slight variation in wind or light before I press the trigger, then make sure of the sights being perpendicular, take a full breath and commence a steady pressure, and when satisfied that I can hold quite steady for a second or two longer, apply the little extra pressure, the rifle going off, as it were, quite unexpectedly. After firing I continue the aim for a moment, as I regard it as a bad practice some have of immediately jumping up to see the effect of their shot, as I have often seen bull's-eyes scored from following this practice, when otherwise, from a rifle's hanging fire, almost any one else would have failed to hit at all."

Of course, at a moving mark, or on a very windy or dark day, the aim must be quick.

As has been stated, most riflemen prefer, in aiming, to "draw a half sight." The best authorities, however, are in favor of "drawing a full
sight”—aiming just under the bull’s-eye,—as in this way a full view of the target is obtained.

On account of the rifling, a bullet has a certain tendency towards the direction in which the grooves turn, known as “drift,” the following being the table for the Whitworth rifle.*

<table>
<thead>
<tr>
<th>Distances...</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drift.......</td>
<td>2</td>
<td>5</td>
<td>9</td>
<td>14</td>
<td>20</td>
<td>27</td>
<td>35</td>
<td>44</td>
<td>54</td>
<td>65</td>
</tr>
</tbody>
</table>

To overcome this tendency, many, in firing at long ranges, aim at the left corner of the bull’s-eye.

As has already been explained (page 32), an allowance must be made for any wind existing. The rifleman must have his wits about him, and notice if any change takes place in its direction and force; and also whether there is any conformation of the ground which will cause it to blow with greater force, or in a different direction, at any place between himself and the target, than where he is placed. He should also bear in mind that, in retiring from a short to a longer range, a greater allowance must be made for the pressure of the wind upon his bullet. To give any tables for “allowance for wind” is necessarily difficult, depend-

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*I know of no table for any other rifle.*
SUGGESTIONS TO MARKSMEN.

As it does upon the peculiarity of the rifle and charge used. The following, however, may be of service:

CLASSIFICATION OF WINDS.

<table>
<thead>
<tr>
<th>Gentle</th>
<th>4 miles an hour</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate, 10 &quot; &quot; &quot;</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Fresh, 20 &quot; &quot; &quot;</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Strong, 35 &quot; &quot; &quot;</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Very high, 50 &quot; &quot; &quot;</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Gale, 80 &quot; &quot; &quot;</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

ALLOWANCES FOR CROSS-WIND (IRRESPECTIVE OF DRIFT).

**Right Wind.**

<table>
<thead>
<tr>
<th>Force</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ft. in.</td>
<td>Ft. in.</td>
<td>Ft. in.</td>
<td>Ft. in.</td>
<td>Ft. in.</td>
<td>Ft. in.</td>
</tr>
<tr>
<td>200</td>
<td>0.3</td>
<td>0.5</td>
<td>0.7</td>
<td>0.9</td>
<td>1.1</td>
<td>1.4</td>
</tr>
<tr>
<td>300</td>
<td>0.5</td>
<td>0.8</td>
<td>1.0</td>
<td>1.2</td>
<td>1.9</td>
<td>2.6</td>
</tr>
<tr>
<td>400</td>
<td>0.7</td>
<td>1.0</td>
<td>1.6</td>
<td>2.0</td>
<td>3.0</td>
<td>4.0</td>
</tr>
<tr>
<td>500</td>
<td>0.9</td>
<td>1.6</td>
<td>2.6</td>
<td>3.6</td>
<td>5.0</td>
<td>7.0</td>
</tr>
<tr>
<td>600</td>
<td>1.4</td>
<td>2.0</td>
<td>3.6</td>
<td>5.0</td>
<td>7.0</td>
<td>10.0</td>
</tr>
<tr>
<td>700</td>
<td>1.8</td>
<td>3.0</td>
<td>4.0</td>
<td>5.0</td>
<td>7.0</td>
<td>10.0</td>
</tr>
<tr>
<td>800</td>
<td>2.0</td>
<td>4.0</td>
<td>6.0</td>
<td>9.0</td>
<td>12.0</td>
<td>17.0</td>
</tr>
<tr>
<td>900</td>
<td>2.8</td>
<td>5.6</td>
<td>8.0</td>
<td>12.0</td>
<td>16.0</td>
<td>22.0</td>
</tr>
<tr>
<td>1000</td>
<td>3.6</td>
<td>7.0</td>
<td>11.0</td>
<td>16.0</td>
<td>21.0</td>
<td>30.0</td>
</tr>
</tbody>
</table>

**Left Wind.**

<table>
<thead>
<tr>
<th>Force</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ft. in.</td>
<td>Ft. in.</td>
<td>Ft. in.</td>
<td>Ft. in.</td>
<td>Ft. in.</td>
<td>Ft. in.</td>
</tr>
<tr>
<td>200</td>
<td>0.4</td>
<td>0.6</td>
<td>0.8</td>
<td>1.1</td>
<td>1.3</td>
<td>1.6</td>
</tr>
<tr>
<td>300</td>
<td>0.6</td>
<td>0.9</td>
<td>1.0</td>
<td>1.4</td>
<td>2.0</td>
<td>3.0</td>
</tr>
<tr>
<td>400</td>
<td>0.8</td>
<td>1.2</td>
<td>2.0</td>
<td>2.6</td>
<td>3.3</td>
<td>4.6</td>
</tr>
<tr>
<td>500</td>
<td>1.0</td>
<td>1.8</td>
<td>2.8</td>
<td>4.0</td>
<td>5.6</td>
<td>8.0</td>
</tr>
<tr>
<td>600</td>
<td>1.6</td>
<td>2.3</td>
<td>4.0</td>
<td>5.6</td>
<td>8.0</td>
<td>11.0</td>
</tr>
<tr>
<td>700</td>
<td>1.8</td>
<td>3.6</td>
<td>5.6</td>
<td>8.0</td>
<td>10.0</td>
<td>14.6</td>
</tr>
<tr>
<td>800</td>
<td>2.6</td>
<td>4.6</td>
<td>7.0</td>
<td>10.0</td>
<td>13.0</td>
<td>18.6</td>
</tr>
<tr>
<td>900</td>
<td>3.0</td>
<td>6.0</td>
<td>9.6</td>
<td>13.0</td>
<td>17.0</td>
<td>25.0</td>
</tr>
<tr>
<td>1000</td>
<td>4.0</td>
<td>7.6</td>
<td>12.0</td>
<td>17.6</td>
<td>22.0</td>
<td>34.0</td>
</tr>
</tbody>
</table>
These allowances are estimated for a Whitworth rifle, which, as is well known, has an unusual velocity, so that for an ordinary rifle they will probably have to be increased. The more moisture there is in the air the less elevation is required, although the contrary would be naturally supposed to be the case.

In most matches a rifleman is allowed to take one or two preliminary shots in any position known as "sighting shots," which do not count on his score; and by carefully observing the effect of these he can form a pretty good opinion of the conditions he has to contend against.

In order to profit thoroughly by experience, most riflemen who are ambitious of becoming "marksman," keep a private record of the results of their practice, not only putting down the points made, but the range, elevation, weather, wind, together with the sights, rifle, and ammunition used. A form of such a record is contained in the Appendix.

SIGHTS.

In discussing the question of the best sights a wide field is presented. In military competitions the shooting is required to be with "open sights," and the question is, therefore, simplified.
Most of the foresights upon military rifles are, however, too blunt, and can be improved by a little filing; but care must be taken that no reduction is made in the height, or the elevation will be altered, and the rifle made to shoot higher.

In "small-bore" (sporting rifles), or "all-comers" matches, the competitors are at liberty to use any sights they choose, and the quantity (a hundred or more) they have to choose from, may well appall a beginner.

The most improved American target rifles are fitted with telescopic sights, with crossed lines with which a rifleman can "draw a bead" on a pigeon at nearly half a mile. These, however, are mainly valuable at long ranges, where the rifle is made very heavy (from 15 to 30 pounds), and is fired from a rest—a species of practice valuable for experiment, but savoring somewhat of light artillery, and which is not in accordance with a military system. Moreover it does not follow that because these or any other sights enable the rifleman to aim to an inch, that the shooting will be proportionately fine. The very best rifles will vary somewhat, and in shooting at a long range, a variation of at least two feet must be expected, even where the same bullet-hole is aimed at each time.

The favorite sight among marksmen, is the
"peep and globe." The back sight consisting of a sliding disk having an aperture the diameter of a small pin, and the foresight being a pin inclosed in a metal globe for protection. The latter are now made with a glass cover protected by a metal shield, which can be raised when desired.

The "peep" sight admits of but little variation, although disks of different sizes are made, and complicated scales of elevation are often used. The foresight may be a simple pin or a pin with a perforated head, or a skeleton bar, etc. In using these the intermediate back-sight is generally discarded. The recently introduced "Beach-sight" is now being extensively used. It is composed of an ordinary open sight set at right angles with a globe sight, and turning on a hinge so that when one is turned down the other is up—both sights being of the same elevation.

The English marksmen have their foresights arranged with a "wind gauge" marked with a scale, which can be adjusted by a screw to allow of whatever lateral deviation may be desired; but this is unusual here.

By the rules of The National Rifle Association, all foresights which prevent the marksman having any view outside the target at which he is aiming, are excluded on account of the liability to accidents arising from their use.
RIFLES.

To obtain the best results, the rifleman must use the best instruments. The question as to whether a muzzle-loader is more accurate than a breech-loader, is one which has excited considerable discussion. The better opinion, however, appears to be that it is. The difference in its favor, however, is so slight as to be practically immaterial,* and even that can only be obtained upon the practice-ground and by the exercise of the utmost care in loading and the selection of ammunition. For military purposes there is no comparison, and even for sporting purposes whatever superior accuracy may belong to a muzzle-loader, does not begin to compensate for the many advantages that exist in favor of the breech-loader. As the latter have been adopted by the State of New York for its National Guard, and are rapidly com-

*MEAN RESULTS OF TARGET PRACTICE AT SPRINGFIELD ARMORY.
REMINGTON RIFLE FIRED FROM FIXED REST.
ing into use among riflemen everywhere, the author has confined this work mainly to them, and has alluded but seldom to muzzle-loaders. The favorite kinds of breech-loading rifles used in this country by sportsmen, are the Remington, Ballard, Sharp, Winchester, Spencer, Wesson, and Maynard. The latter, although highly spoken of, and enabling the riflemen to manufacture his own cartridges is objectionable as requiring the use of a cap. To decide upon the merits of the others is a difficult task, upon which the best riflemen differ. As far as the author's personal purposes are concerned, he would class them in the order of their names. Whatever rifle is selected, the bore should not be less than .44 calibre. For shooting at long distances and at large game, it is claimed that a larger calibre is preferable. This is the belief out west; but as the various military commissions who have devoted years to investigations differ radically on the subject, the author confesses himself unable to decide upon the matter. A large bore, however, involves a heavy charge and greater recoil, unless the weight of the rifle is increased.

CARTRIDGES.

In the selection of ammunition, care must be taken to secure none but what comes from
reliable makers. In order to be able to speak advisedly of the merits of the different styles of bullets and cartridges, the author has examined the models adopted by the military commissions of a number of different governments, and has consulted with representatives from the leading rifle manufactures. The result has been that none of these have agreed in more than a single particular, and although theories exist in abundance, there appears to be nothing settled upon the point.

Lieutenant Russell, in his valuable work on rifle-practice, states that all American rim fire cartridges are unreliable. But this is rather too sweeping. The first metallic cartridges did not contain enough powder to secure a sufficiently low trajectory, and were not particularly accurate. The charge has now been greatly increased, and by the introduction of machinery they are loaded much more carefully.

Some of them are very reliable; others, less so, for reasons which no one seems to be able to give a satisfactory explanation. The .44 calibre cartridge, known as "Kentucky, No. 46," is stated to be equal to any if not the best. It appears, however, to be the general opinion, that the "central fire" is preferable to the "rim fire." Metallic cartridges are now made having a paper patch around the ball. This
appears, from the report of the U. S. Examining Board at St. Louis, to insure increased accuracy, to have avoided leading the barrel altogether, and to have prevented all but a moderate degree of fouling in firing 500 consecutive rounds; but even this is not acquiesced in by many manufacturers. It is also asserted by some that those cartridges in which the metal case is "crimped" around the ball, are not accurate, as the crimping gives a "wobble" to the ball when fired; but this is also disputed. Although additional care is being used in manufacturing prepared ammunition, better results would probably be obtained if riflemen would charge their own cartridges, particularly in the case of "central fire" shells using the Berdan cap.

In doing this, however, they should recollect never to use sporting or fine powder, as the fouling and recoil will be great; but to choose rather that of a moderately large grain and low density; and that they must be particular to see that their bullets are inserted in the cartridge in a true line with its axis.

The question of ammunition, however, like that of rifles, is one upon which many differences of opinion exist which cannot be properly discussed in the limits assigned to this work, and which can only be decided by individual experience.
CONCLUSION.

In conclusion, the author would submit that in all competitions every rifleman should recollect the following advice, given by an experienced marksman:

"That as every point is a serious consideration, he should devote himself, during a match, entirely to the object in view, and not to allow his attention to be distracted by conversation or argument, particularly while loading. If any disputes arise in regard to his practice or score, refer the objector to the proper authority, and never give way to anger, or disappointment, or envy, from any supposed advantage others may have as regards better ground, target, etc. Refrain also from anxiety as regards the score of others; for should they be doing better, it may make you over anxious; if worse, it may induce over confidence, and possibly, sad disappointment. As neither your score nor theirs can be altered by wishing, do not be continually reckoning up your own, as it is a waste of time and distracts the attention. Do not take the advice of any one, even of your best friends, but rely upon your own judgment; by this I do not mean to say that nothing can be

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gained from observing the conduct of good shots who may precede you; for many a hint may be stolen in that manner; but even this should be done away with as soon as possible, as it will render you more confident in your own judgment. Never, on any account, permit even a friend to touch your rifle, sights, or ammunition, or load for you; and be sure that your ammunition is where it is not likely to be disturbed. Be on hand in time to avoid hurry; but if late, take it coolly, for if you run you will destroy your steadiness, and lose anyway; whereas you may be in time and win, if you walk.

Be as careful as possible in all that you do, and take as much pains with your first or any other shot as your last, never throwing away a shot, even when all chance for distinction has passed, and thus never be obliged to say: 'I never thought such a small score would come in;' or, 'If I had only taken more pains in my first shots,' and so on. Finally, if beaten, never say you don't care; for what is worth competing for is worth winning, be it only a wreath of perishable leaves, which was the highest reward in olden time at the world-renowned Olympic games of Greece."

To which the author would add—if you are fairly beaten, own up.
### FORM I.

**RECORD OF CANDLE-PRACTICE OF CO. F, 22D INFANTRY.**

**N. G. S. N. Y. ................. 1872.**

<table>
<thead>
<tr>
<th>NAMES OF ENLISTED MEN IN THE COMPANY.</th>
<th>REMARKS.</th>
<th>CAP FIRING.</th>
<th>TOTAL HITS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. B. ..................................</td>
<td>good.....</td>
<td>1 1 1 1 0 1 1 0 1 1</td>
<td>9</td>
</tr>
<tr>
<td>C. D. ..................................</td>
<td>medium...</td>
<td>1 0 1 1 0 0 0 1 1 1</td>
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<td>G. L. .................................</td>
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<td>Rifle—Remington</td>
<td>2d Prize.</td>
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<tr>
<td>Wind—XI strong</td>
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<td>Weather—Cloudy</td>
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<td>Sights—Back, Front</td>
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FORM III.

TABLE OF MEAN ELEVATIONS, WITH DATE, ETC., OF PRACTICE.

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"No careful man will ever think of shooting without keeping a record of his practice."—Capt. Heaton.
"Unless a man finds out, and remembers why he misses, he will never know how to hit."—The Master of Lovat.
**Remington Rifle.**

The operation of the Remington rifle adopted for the use of the National Guard of the State of New York, is explained in the annexed cuts:

*Fig. I* shows the arm with the several parts in the position assumed in the act of firing, the side of the frame being removed to enable the several parts of the arm to be seen.

*Fig. II* shows the arm when open to receive a cartridge. The side of frame and also of guard-strap are removed.

*Fig. III* shows the arm with the breech closed after inserting the cartridge. The side of the frame and guard-strap are removed, and the breech-block is shown in section in order to expose the firing-pin and firing-pin retractor.

The New York State model differs from the Remington rifle, adopted by the navy of the United States and by various European nations, in the following particulars:

First. The firing-pin is retracted by a *positive* movement consequent upon the act of opening the breech in order to load.

Second. The cartridge-case is ejected from the chamber of the gun by an ejector-spring operating through the extractor.

Third. The hammer is arranged to operate
in connection with a secondary sear so constructed as to permit the hammer to pass under the breech far enough to secure it as soon as closed. In this position the secondary sear is engaged with the half-cock notch, and the arm cannot be fired until the hammer is again cocked.

The positive retraction of the firing-pin is effected by a lever \( e \) (Fig. I), and dotted lines \( e \) (Fig. II), which, when the block is drawn back, rides over the lever or secondary sear \( c \), and draws back the firing-pin \( f \) to the position shown in the drawing. When the hammer strikes the pin \( f \), it drives it forward and explodes the cartridge, and, upon again opening the block, the firing-pin is withdrawn as before. It is therefore impossible to open the block without retracting the firing-pin.

The arrangement of the cartridge-extractor and ejector is shown in Fig. III. A flat disk \( D \) is let into an annular groove in the breech-block and has a motion both with and also independent of the block. A spring \( l \) let into the side of guard-strap rests upon this disk. When the block \( B \) is swung back in the act of loading, no movement is imparted to the extractor. By continuing the backward movement of the breech the extractor \( D \) is carried with it, thereby with-
drawing the cartridge-case from the chamber. As soon as the shoulder \( o \), on the extractor, passes the end of the spring \( l \), it receives a quick accelerated movement from the action of the spring upon the incline \( o \), which suffices to throw the cartridge-shell from the chamber.

The arrangement of the hammer with respect to the sear \( bb \) and secondary sear \( c \) will be understood by reference to the cuts (Fig. II and III). The trigger \( a \) and sear \( bb \) are pivoted upon the same pin. The sear is formed with an extension forward \( bb \), of such length and shape as to ensure the disengagement of the sear from the full-cock notch by the act of swinging back the block. The secondary sear \( c \) is pivoted to the guard-strap and receives a slight angular movement from the act of opening the breech, and is also capable of a longitudinal movement limited by the length of the slot \( p \). The spring \( h \) serves to retain it in the position shown in Fig. II.

In manipulating the arm the hammer is first brought to the full-cock. The breech being then pressed back, its first movement forces down the forward end of the secondary sear \( c \) and engages its rear end with the half-cock notch in hammer. By continuing its backward movement, the cartridge-extractor is brought
into operation, and finally the sear $bb$ is disengaged from the full-cock notch and the hammer falls against the breech in the position shown in Fig. II. The block being then pressed forward, the hammer falls under it as far as the length of slot $p$ will permit, leaving the arm in the position shown in Fig. III. In this position the sear cannot be pulled out of the notch, and it is necessary to cock the hammer before the gun can be fired. It is not intended that the arm should be carried in this position ordinarily, as the main-spring is compressed to nearly its full extent. The carrying position is that of the regular "half-cock."

The following is a brief résumé of the official action which has resulted in the adoption of the Remington breech-loader for the service arm of the State troops in accordance with the following order:

STATE OF NEW YORK, ADJUTANT-GENERAL’S OFFICE,
ALBANY, NOVEMBER 1, 1871.

General Order No. 22.
The board appointed by General Orders No. 11, current series, "to examine into the merits of various kinds of breech-loading rifle muskets," having reported to the Governor the result of such examination, and recommended the adoption of the Remington rifle musket, improved model, for the use of the National Guard, the same is hereby approved and confirmed.

By order of the Commander-In-Chief.

J. B. STONEHOUSE, A8s’t-Adj’t-General.

The first board for the consideration of re-armament was convened on the 10th of October, 1866, in accordance with Special Order (No.
issued from the Adjutant-General's office, naming Adjutant-General Irvine, Commissary-General of Ordnance Palmer, Colonel William G. Ward, of the Twelfth N. Y. S. N. G.; Colonel George M. Baker, of the Seventy-fourth, and Inspector-General Burt, "a commission to make examination and trial of the recent inventions and improvements in breech-loading military small arms, and especially of such inventions and improvements as have been made for alteration of the muzzle-loading military arms now in use."

After a number of sessions, lasting from November 29, 1866, to December 11, 1866, during which seventeen plans for transformation were presented, conspicuous among which were the Allin, Berdan, and Roberts, besides ten arms entered as "not specially adapted to conversion," the most notable being the Remington, Peabody, and Sharps, the board, by its report, dated May 18, 1867, reported to the Adjutant-General favorably to the Roberts for transformation, and to the Remington in "order of merit of original arms not adapted to conversion."

This official determination was, however, inoperative, owing to circumstances which need not be recited, and the subject of re-armament
was suspended from official consideration until the winter of 1871. The Legislature of that year having appropriated the sum of $250,000 for the purchase of a complement of breech-loaders for the National Guard, in accordance with the provisions of the bill, a board was constituted, by order of the Commander-in-Chief, of the following members: Franklin Townsend, adjutant-general; James McQuade, inspector-general; Samuel William Johnson, chief of ordnance; with instructions "to examine into the merits of various kinds of breech-loading rifled muskets, and to report the result of such examination to the Governor." At the first meeting of the board, at the State Arsenal in the city of New York, on the 7th of June, eighteen different systems were offered for trial. The sessions of the board continued through the summer and autumn, concluding in an exceptionally thorough trial of such arms as more nearly satisfied the official requirements. The report of the board was finally rendered on the 28th of October, its determination of a particular system and of the relative merits of the various systems subjected to trial, being expressed as follows:

In arriving at the recommendation embodied in this report, the board considered, primarily,
the relative merits of the various systems presented as regards strength, durability, accuracy, and simplicity of mechanism, and liability to accident in the hands of raw troops who might be comparatively inexpert in the use of arms; secondarily, economy, rendered necessary by the limitation of the appropriation for the purchase of arms, and, in view of the urgent necessity for the immediate procurement of breech-loaders for the National Guard, the ability to speedily furnish the requisite number.

The board recommended unanimously the adoption of the Remington rifle musket, of the improved model manufactured for and submitted to this board (loading at assimilated half-cock, locking the breech-piece in the loading, withdrawing the firing-pin by a positive motion, and ejecting the shell on opening the breech), as the best arm, in all respects, for the use of the National Guard of the State of New York. In order to make it conform to the calibre used by the United States Government, the board recommended the adoption of the 50-100 calibre, although, but for this consideration, and as an independent proposition, they would have preferred the 433-1000 calibre.
Schuyler, Hartley & Graham,

19 MAIDEN LANE AND 22 JOHN ST., NEW YORK,

Importers and Manufacturers of and Dealers in

MILITARY AND SPORTING WARES,
EQUIPMENTS AND MUNITIONS,

comprising all classes of

Service Arms and Arms of Precision,
Single Shot or Repeating Sporting Rifles,
Breech or Muzzle-loading Double Guns,

of the most approved English, Belgian, French or American fabricants;

SINGLE SHOT OR REPEATING PISTOLS
of every variety of domestic or foreign make:

METALLIC AMMUNITION AND PERCUSSION CAPS,

including the productions of the UNION CARTRIDGE COMPANY,
now most highly regarded by Military Men and Experts, as well as other manufactures.

RANGE AND TARGET-PRACTICE FURNITURE,

Targets, Tents, Flags, Field-glasses, Lunch-baskets,
Timing Watches, Cartridge Reloading-tubes
for Rifles or Double Guns, &c., &c.
SPORTING RIFLES & TARGET ARMS.

SCHUYLER, HARTLEY & GRAHAM,

Would invite attention to the following list of Sporting and Practice Arms, constantly in stock, at No. 19 MAIDEN LANE.

Remington's Sporting Rifle, using rim or centre fire Metallic Cartridges, calibre 36-100 and 44-100 of an inch. This rifle possesses the approved breech system and action, adopted by the U. S. Navy and by several European States, of which more than half a million are in the hands of troops. The Adirondack Remington, calibre .45, uses the Berdan Patent Centre Fire Reloading Cartridge.

Price, 30-inch Steel Barrel . . . . . $30.
" 32 " " " " . . . . . 32.
" 34 " " " " . . . . . 40.

An extra charge of $5 for set triggers, and the same for globe and peep sights. Orders promptly filled for the above arm, of any degree of finish and ornamentation.

F. Wesson's Celebrated Breech-Loading Rifle.—The excellent workmanship of these arms has given them a high repute with professional shots and sportsmen. The Wesson is made of four calibres, viz., 22-100, 22-100, 38-100, and 44-100, and of 24, 26, 28, or 30 inches length of barrel.

Ballard's Sporting Rifle.—This is a great favorite, and indorsed by a long experience in thousands of expert hands as a safe and reliable arm. The model known as the Kentucky Ballard, enjoys an exceptional popularity.

The calibres and lengths of barrel are as follows:

24-inch medium or heavy, 22, 22, 22, 44, 46 and 50-100 calibre, $35.
26 " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " " 
tary arm, in use in the Roumanian and Swiss armies, and the original of the Martini Henry, now being manufactured for the British army. Its calibres and barrel-length are of the various degrees before enumerated.

Flobert Saloon Rife.—Calibre $6\frac{m}{m}$ and $9\frac{m}{m}$; length of barrel, 21 inches. A well-known parlor and saloon arm, with which in-door practice can be profitably pursued. The rudiments of marksmanship are enjoyably as well as conveniently attainable by the use of this popular invention.

---

BREECH-LOADING SHOT-GUNS.

---

SCHUYLER, HARTLEY & GRAHAM,

Have at all times in stock the productions of the best European and American manufactures of fowling-guns, for several of which they are exclusive agents in the United States. Distinct merits are claimed for the

Westley-Richards Double-Gun.—A breech-loader, with front action-locks, and generally similar in form to a muzzle-loader. This gun uses pin or central fire ammunition; works without a lever, thus dispensing with a certain weight of metal, and is the arm most in use by English sportsmen.

The Greener Breech-Loading Gun, as made by Greener, Scott, Moore, Hollis, and other approved shops.

The Lancaster & Daw's Breech-Loading Gun.—A lever action, pin or central-fire—a very safe piece.

The Dougal Patent Lock-fast Breech-Loading Gun.—Pin or central-fire. Side-lever action. The secure locking of the breech at the moment of discharge, is a distinct claim of this piece.

The Lefaucheux Breech-Loading Gun.—Pin-fire, with lever under-chamber. This is the approved French double-gun.

The Mathews' Patent Breech-Loading Gun.—Made by Greener, Moore, Scott, and other recognized English fabricants. Pin or central-fire, with snap-action lever in the rear of hammers.
The Whitney Patent Breech-Loading Gun.—This is the best domestic production, and is fast finding favor with old patrons of the foreign manufacture. It uses re-loading cartridge shells of the Union Metallic Cartridge Company's make—an important advantage to the sportsman in the easy provision as well as economy of ammunition.

The foregoing arms are of the various calibres used by sportsmen, fitted with barrels of the best laminated steel, and put up in various degrees of finish and furniture.

PISTOLS,

SINGLE-SHOT, REVOLVING, REPEATING, OR SELF-COCKING.

The stock of holster, side, or pocket small-arms, comprises the entire variety produced in this country and Europe, and answers every necessity of target, game-shooting, or defensive use.

The well-known manufacture of the

COLT ARMS COMPANY,


Colt's Patent House Pistol, of .41 calibre and four chambers, using the same ammunition, is a specialty of this house.

The National Colt Revolver, is the most effective Pocket Revolver ever produced (as now improved), being of the same capacity and only half the size and weight of present style of Cartridge Revolvers, is only seven inches extreme length, carrying six 82-100ths balls, and can be safely carried in any pocket without inconvenience. It loads from the fore end of cylinder, with a Central-Fire Waterproof Cartridge.
The Colt New Patent Deringer and The National Deringer, are the most approved models of a weapon long celebrated for its effectiveness and accuracy of fire.

The Stevens' Target or Saloon Pistol, fitted to a skeleton stock or detachable shoulder-rest, quickly loaded and easily carried in the pocket, is not only a most convenient arm for practice, but exceedingly effective for sporting uses.

The New Smith & Wesson Army Revolver, No. 3.—This pistol, adopted by the Russian Government, and known as the Russian model, possesses unique merits for precision and workmanship. Its ammunition is the Union Berdan .44 metallic cartridge, and its feature of self-acting cartridge extraction, gives it extraordinary claims for convenience and rapidity of fire, thus rendering it an excellent target pistol. The attachable breech fitted to this arm makes it almost equal to a rifle for accuracy and range.

In service this arm has been found durable and efficient, giving no trouble or inconvenience. Its weight is 2 3/4 lbs.; Calibre, .44; Length of Barrel, 8 inches. In point of accuracy these pistols are unsurpassed by any in the world, as will be seen by the diagram of a target made from rest, with the above-described revolver, at a distance of 155 yards. The full size of this target is 26 inches, and the mean deviation of shots from center, 5 1/2, inches. Every Pistol warranted.

The illustrations on the next page represent this unequalled arm with breech closed as well as open, the latter showing the action of the Automatic Shell Ejector, which is the specialty of the No. 3 Smith & Wesson revolver.

As will be seen by the cut, the exploded cartridge-shells are ejected by the act of opening the pistol for the purpose of charging the chambers.
METALLIC AMMUNITION.
THE UNION METALLIC CARTRIDGE COMPANY,
of which
SCHUYLER, HARTLEY & GRAHAM
are exclusive Agents, is the largest manufacturer of Metallic Ammunition and thoroughly reliable Percussion Caps in the world. Performing every process by the most exact machine appliance, and possessing operative and scientific resources attainable only by an extraordinary liberality of experiment and outlay, its product, comprising calibres and shapes suited to every known arm, is indorsed by experts of all countries for superla-
tive excellence. The Central-fire Cartridge made by this Company claims the following distinctive qualities:

Being made and adjusted by machinery, in accordance with the most precise system of gauges, each part is perfect, fitting and loading smoothly, and with accuracy. The metal is a composition combining the very best materials of the kind best adapted for their manufacture; and the expansion under rapid firing does not interfere with easy extraction of the empty shell. The material, moreover, being brass, of a substantial thickness, is proof against the corrosion which, in a copper shell, is the inevitable result of the chemical action of any fulminate, the constituents of which are mercury and chloride of potash. This cartridge is, therefore, in all respects well-calculated for storing in arsenals, or for marine service—it being entirely waterproof and unaffected by local or climatic dampness, both through the excellence of its material and its construction. While these are the essential qualities of this production, its capacity of repeated fire offers economical advantages that are of very great importance. The character of its material permits an almost indefinite re-loading of the Union Metallic Central-fire Berdan Shell. The value of this quality to sportsmen and to associations of sharp-shooters, either private or public, does not need to be argued.

We would call attention to the Double Water-Proof and Foli-Lined Percussion Caps manufactured by the Union Metallic Cartridge Company, as superior to the imported article.

*Dixon's Re-loading Tubes for Sporting Cartridges.*—This effective contrivance for the use of sportsmen, and indispensable fixture to the modern fowling-piece, has been introduced in the United States by

**SCHUYLER, HARTLEY & GRAHAM.**

*Cartridge Reloading Tools.*—For the recharging of their Berdan Central-fire Shells, the Union Metallic-Cartridge Company manufactures a simple device, illustrated in the accompanying cuts.
After sticking the primer into the shell, put the shell upon the plunger; swing the plunger to its place and close the handles with some force.

This tool simply presses the bullet to its place, completing the cartridge.

After inserting the shell, close the handles just enough to cause the chisel to penetrate the primer; then elevate the tongue sufficiently to throw it out.
The King - Tileston Cartridge - Box.—Illustrated in the accompanying figures, as now constructed for sporting as well as military purposes, is a desirable item of equipment. Its capacity is more than equal to the old styles of box, while it keeps the cartridges in better condition and possesses features of convenient manipulation that will readily be recognized.

FIG. 1.

FIG. 2.

FIG. 3.
HOFFMAN'S ATTACHMENT
TO THE BAYONET SCABBARD.

Adopted by the United States Government,
is a decided improvement, consisting merely in the attachment of
a loop to the scabbard by a swivel; the belt holding the scabbard
passes through the loop, thus allowing the scabbard free play,
and adapting itself to every position of the soldier. With the old
attachment, the scabbard is broken or cracked every time the
soldier sits down with his accoutrements on; the new arrange-
ment entirely prevents this.

Old scabbards can have this improvement attached to them at
small cost.

SCHUYLER, HARTLEY & GRAHAM.

Are sole Agents for the two inventions preceding.

TIMING WATCHES.

1–4, 1–5, AND FULL SECOND MARKERS.

This establishment has recently perfected its arrangements for
the introduction of the work of

J. ALFRED JURGENSEN,
in the United States. These Timekeepers are not only admirably
adapted for ordinary use, but as pocket-chronoscopes for engi-
neering, ordnance, or racing requisites, are unequalled in exact-
ness, reliability, and convenience of observation.

FIELD AND MARINE GLASSES.

SCHUYLER, HARTLEY & GRAHAM

have constantly in stock the best Opera, Field and Marine Glasses,
Telescopes, etc.

The Wimbledon Binocular Field Glass.
The Wimbledon Telescope.
The Lord Bury Telescope.
The above-named Glasses, in general use with the British National Rifle Association, at import prices.

In anticipation of the general establishment of Rifle Practice in the United States,

SCHUYLER, HARTLEY & GRAHAM

are prepared to furnish at reasonable notice, all the equipments of a Rifle Range, including

*Targets of the Wimbledon Construction and Model,*

*Shooting Screens,*

*Tents, Marquees,*

*Regimental Colors,*

*Flags, and Markers,*

and the various items required by public or private associations of marksmen. All the improved appliances of foreign practice and competition are thus readily attainable by associations in any part of America.

Orders or requests for estimates should be addressed to

SCHUYLER, HARTLEY & GRAHAM,

No. 19 Maiden Lane, NEW YORK.
UNIFORM AND FATIGUE CAPS, CHAPEAUX, ETC.

BENT & BUSH,
273 AND 275 WASHINGTON STREET,
BOSTON, MASS.,

ASK THE ATTENTION OF THE

National Guard of the United States

To their stock of Uniform and Fatigue Caps, Chapeaux,
Epaulettes, Shoulder-Knots and Straps, Swords,
Sword-Belts, Plumes, Buttons, Laces,
Etc., Etc.

Thousands of our Caps are now worn by the U. S. Regular Army, and the Militia of the different States, and we know from our long experience we can give the best of satisfaction to those who favor us with their orders.

We warrant all our Fatigue Caps to hold their color, and also to be

WATERPROOF.

We shall be pleased to send samples of our work to any parties desiring to order from us.

Orders by mail will receive prompt attention.

Goods sent C. O. D. to any part of the United States.

BENT & BUSH,
273 and 275 Washington Street,
BOSTON, MASS.
ESTABLISHED 1847.

BAKER & MCKENNEY,

Manufacturers of and Dealers in

MILITARY GOODS,

141 Grand Street, N. Y.,

Have constantly on hand the

New Army Regulation Chapeaux, Uniform
Dress Hats and Caps, Shoulder Knots,
Shoulder Straps, Swords, Sword Belts,
Plumes, Epaulettes, Sashes,

and all goods necessary for the U. S. Army and National Guard of the various States.

Have furnished the National Guard of the State of New York, by contract, ten years with Caps and Equipments; also have just completed a contract with the State of Connecticut for Caps, Equipments, Knapsacks, &c., and from our long experience can guarantee satisfaction to all who may favor us with their orders.

Samples sent to parties desiring them.

All Orders promptly attended to.
SHANNON, MILLER & CRANE,
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THE NATIONAL RIFLE ASSOCIATION.

They are printed on a card to be hung upon a wall for

PRIVATE PRACTICE IN AIMING DRILL,

as recommended at page 135 of WINGATE'S MANUAL, and may be used either at an Armory or a private residence.

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The following is a perspective cut of this celebrated arm:

The Peabody is simple, substantial, reliable. Rust does not embarrass its mechanism or obstruct its firing-pin, as in some notorious arms, threatening miss-fires or premature explosions. Since the Peabody was first brought out, the first accident with it is yet to be reported. None can happen by reason of the breech.

The Peabody is handy and elegant in shape. No hump-backed breech-block exposed to injury deforms its symmetry. Its entire mechanism, except the lever, works within the gun. It contains no fancy spring-ejectors. Positive leverage of great power extracts every shell unfailingly. No spiral-spring is required, and but two flat springs are applied to the entire breech, both of which may be dispensed with without disabiling the arm.

Any system of rifling or metallic cartridge is adapted to the Peabody. It shoots straight, and hits hard.

Its rapidity of fire is believed to surpass that of any single loader. Its manipulation is extremely simple, and it is difficult to go wrong in handling, even in moments of excitement or confusion.

A green hand ought to fire the Peabody 12-18 times per minute. It has often been fired 30 times per minute.

As a military arm, it has the approval of the principal committees of the world, and was recommended for adoption into the
United States army by two United States boards. The following countries have issued the Peabody to their troops: Switzerland, France, England (Peabody-Martini-Henry), Roumania, Canada, Spain (Cuba), Mexico, Connecticut (only State arm), Massachusetts (only State arm). Turkey has also adopted the arm, modified to the English pattern.

**Manual for Peabody Rifle or Carbine.**

1. Place the ball of the thumb of the right hand on the guard-lever, and throw the lever down *smartly*.

2. Insert cartridge with thumb and forefinger, pushing cartridge home with thumb.

3. Cock hammer with thumb, and *simultaneously* close guard-lever with fingers of right hand. 4. Fire.
To take out Breech-Block.—Remove pivot-screw only.
To replace Breech-Block.—Bring the guard-lever up, drop the block in the receiver, forward part first, then press on the rear end of the block until the hole in receiver and in block coincide, and insert pivot screw.

Target.—Eighteen best shots out of twenty, 100 yards, fired before the New York board, from the shoulder, with ordinary military rifle.

Army Rifles and Carbines in quantity, subject to contract.

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Barrel, 20 in.—Calibre, 45—with Sliding Rear Sight, . $30 each.
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  " 20 in.  do., with Elevating Peep Sight, $35 "
  " 36 or 27 in.  do.,  do.  do.  . $37 "

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nations, after the most severe competitions of all the best modern
inventions, and practically endorsed by actual usage in the hands
of soldiers, under a greater number of flags and more varied con-
ditions of climate and military organization than any other arm
has been subjected to, are,

Simplicity and strength of mechanism.

Facility and naturalness of manipulation.

Freedom of working-action and consequent security against
dust, dampness, and gas-fouling.

Positive safety against premature discharge.

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a removal or change of the position of the hand, is of essential
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operating a lever underneath, in opening and closing the breech
of his rifle, the relative advantage of this more natural and easy
manipulation will be appreciated upon the first trial.

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from a fixed rest, is but an average exhibition of the precision of
this piece. While the Remington Military Rifle, though produced

in quantities entirely unprecedented, is accorded a general super-
iority for range and precision, the excellence of chambering and
rifling, to which this superiority is due, is an invariable feature
of the sporting and practice arms, in the construction and finish
of which the most expert artisanship is aided by mechanical ap-
pliances singular to the armory at Ilion.

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FOR MILITARY AND SPORTING RIFLES.

Brass-shell Cartridge, 50 cal. Central-pin, adapted to New York State Model Remington Rifle.
The METALLIC AMMUNITION manufactured by

E. REMINGTON & SONS

comprises both brass and copper shells, and is suited either to central or rim fire actions. The machinery employed in its construction is of the most improved design, the system of gauges particularly being so perfect, that the important essential of uniformity in shells of the same calibre can be guaranteed. The extraordinary strength of base in both the rim and central fire renders these cartridges impervious to dampness, and assures the preservation of fulminate and charge against any influence of locality or climate. This especial excellence of construction, obviously of the greatest importance to sportsmen, often at a remove from purchasing depots and exposed to vicissitudes of weather, also concerns members of rifle-practice associations and amateur shots in an economical sense, the durable base and walls of the brass central-fire shell making it available for almost an indefinite number of re-loadings. The value of this feature to those who have occasion to use considerable quantities of cartridges will soon practically illustrate itself, the fresh ammunition necessarily costing very much more than the material and operation of re-loading. In the instance of military corps and practice clubs having accumulated large stocks of shells, they can be forwarded to the armory at Ilion, and promptly re-loaded and sent back at a very small cost. For the use of individual shots, or associations at too great a distance, a very simple and effective resource is available in the system of

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manufactured by E. REMINGTON & Sons, will be found of especial service, as it gives not only prices but also information, not always attainable, as to the relative charge of different calibres, and the proportions of powder and projectile in each:

**COPPER-SHELL CARTRIDGES—Rim-fire.**

<table>
<thead>
<tr>
<th>Nos.</th>
<th>22 Long</th>
<th>32 Long</th>
<th>38 Long</th>
<th>44 Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight of Ball,</td>
<td>29 grs.</td>
<td>91 grs.</td>
<td>148 grs.</td>
<td>222 grs.</td>
</tr>
<tr>
<td>&quot; of Powder,</td>
<td>5 &quot;</td>
<td>13 &quot;</td>
<td>18 &quot;</td>
<td>28 &quot;</td>
</tr>
<tr>
<td>&quot; of Cartridge,</td>
<td>44 &quot;</td>
<td>126 &quot;</td>
<td>196 &quot;</td>
<td>293 &quot;</td>
</tr>
<tr>
<td>&quot; per 100,</td>
<td>11 oz.</td>
<td>1½ lbs.</td>
<td>2½ lbs.</td>
<td>4½ lbs.</td>
</tr>
<tr>
<td>Price per 1000,</td>
<td>$7.90</td>
<td>$12</td>
<td>$17.50</td>
<td>$21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nos.</th>
<th>44 Ex. L’g.</th>
<th>46 Long</th>
<th>50 Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight of Ball,</td>
<td>222 grs.</td>
<td>306 grs.</td>
<td>460 grs.</td>
</tr>
<tr>
<td>&quot; of Powder,</td>
<td>31 &quot;</td>
<td>35 &quot;</td>
<td>70 &quot;</td>
</tr>
<tr>
<td>&quot; of Cartridge,</td>
<td>299 &quot;</td>
<td>397 &quot;</td>
<td>661 &quot;</td>
</tr>
<tr>
<td>&quot; per 100,</td>
<td>4½ lbs.</td>
<td>5½ lbs.</td>
<td>9½ lbs.</td>
</tr>
<tr>
<td>Price per 1000,</td>
<td>$22.50</td>
<td>$26</td>
<td>$35</td>
</tr>
</tbody>
</table>

**BRASS-SHELL CARTRIDGES—Central-fire.**

<table>
<thead>
<tr>
<th>Nos.</th>
<th>44 Long range</th>
<th>44</th>
<th>45</th>
<th>50 Gov’t.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight of Ball,</td>
<td>222 grs.</td>
<td>400 grs.</td>
<td>290 grs.</td>
<td>400 grs.</td>
</tr>
<tr>
<td>&quot; of Powder,</td>
<td>23 &quot;</td>
<td>77½ &quot;</td>
<td>45 &quot;</td>
<td>70 &quot;</td>
</tr>
<tr>
<td>&quot; of Cartridge,</td>
<td>300 &quot;</td>
<td>687 &quot;</td>
<td>477 &quot;</td>
<td>667 &quot;</td>
</tr>
<tr>
<td>&quot; per 100,</td>
<td>4½ lbs.</td>
<td>9½ lbs.</td>
<td>7½ lbs.</td>
<td>9½ lbs.</td>
</tr>
<tr>
<td>Price per 1000,</td>
<td>$18</td>
<td>$39</td>
<td>$35</td>
<td>$37.50</td>
</tr>
</tbody>
</table>

Primers for Reloading Cartridges, per 1000, $3.

Re-loading Implements (consisting of Bullet-Moulds, Loader and Primer), per set, $5.

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OFFICIAL RECORD

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