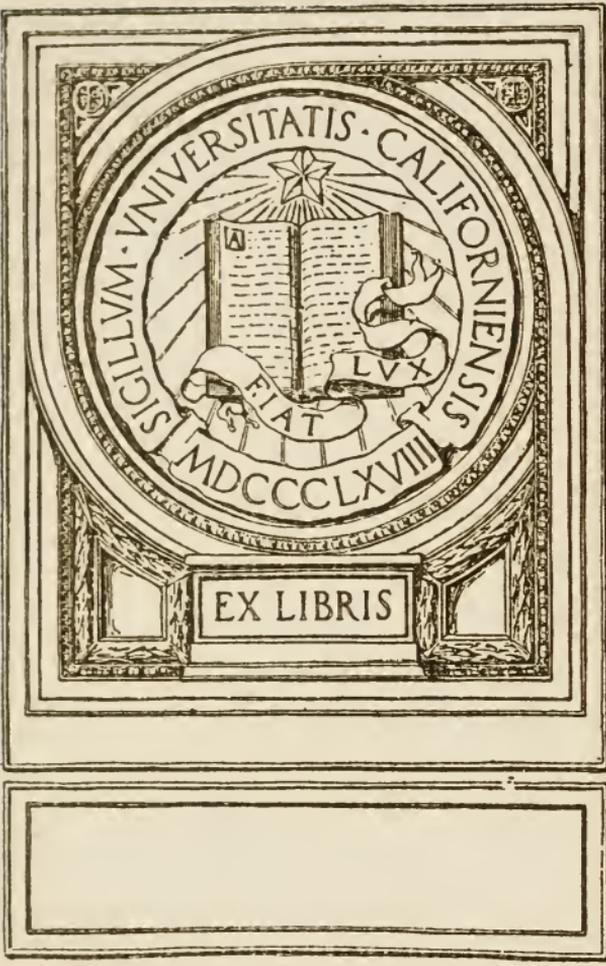


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HOW TO SHOOT

(Including Care and Preservation of the Rifle)

BY MAJOR JAS. A. MOSS

United States Army

INTRODUCTION BY COLONEL WILLIAM LIBBEY

President, National Rifle Association of America

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INTRODUCTION

BY COLONEL WILLIAM LIBBEY

President, National Rifle Association of America

There was a time when we could be considered a nation of rifle shots. Early in the Revolutionary period, certain prisoners of war were taken across the ocean to demonstrate the really dangerous foes we were, because of the wonderful skill at short ranges, which had been developed by the daily use of the rifle.

It was the faithful friend in times of peace or war. It provided the main articles of food for the household, and protected the fireside from intrusion. But like many another friend, when safety and plenty surrounded those early homes, and game became somewhat scarce, it was forgotten, and when remembered it was placed above the family hearth, and there revered for what it had done in the past.

Rifle shooting as a diversion was later on kept alive by a few devoted lovers of this king of outdoor sports. Then came an era of invention which made the rifle of today a remarkable scientific instrument. In the hands of a skillful student of conditions it can be made to do wonders,—far greater even than driving a tack at fifty yards.

All this is of course a mystery to the novice, but as he begins to realize the possibilities of the game, he becomes fascinated by the really scientific problems of ballistics. These problems are complex enough at times to puzzle

even the most acute observer, but when mastered they are most satisfying in their results, both objectively and subjectively.

Since the recent revival of the American spirit of preparedness, many thousands of our younger men are turning back to the old friend of their fathers, now a very different looking gun from the long and heavy rifle of the early days. A piece which can be trusted at a thousand yards as fully as their ancestor's could be depended upon for less than a hundred yards. With this greater range and accuracy have come greater penetration, and our modern rifle has become a most formidable weapon of defense. It is well worth the trouble taken to master it. Aside from its value as a means of training it is a clean sport, as it demands of its votaries keen eyes, good judgment, steady nerves and strong muscles, and who ever heard of these except as the result of a clean and honest life?

This little volume should be an efficient aid in overcoming the technical difficulties involved. It should open the way to a new sport with an ancient and honorable lineage, and at the same time it will help to prepare our citizens in the successful use of their chief means of defense should the safety of our country ever be endangered.

We should always be, judged by our ancestry as well as by our own good sense, a race of citizen-soldiers, confident by reason of our skill at arms, that we can each contribute our full share to defend our institutions if needed. There is ultimately no greater guarantee of confidence

than this trust in our arm of service, and the knowledge that we can use it to the uttermost.

When this period arrives we will be again respected as a nation of rifle shots.

William Libbey

President, National Rifle Association of America.

Princeton, N. J.,

September 20, 1916.

PREFATORY

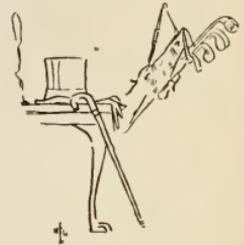
This booklet is based on the corresponding chapters in "PRIVATES' MANUAL," by the Author, and is merely a presentation of the general method of instruction that is followed in teaching soldiers in the Regular Army how to shoot.



Then

That, unlike our forefathers, we are no longer a nation of shots, and that, if we would be prepared to defend our Country, our people must learn to shoot, is shown by the significant fact that of the 119,874 National Guardsmen on the rolls at the time of the President's call in connection

with the mobilization on the Mexican border, 56,813, or about 47% had never fired a rifle, and more than 14,000 had received ratings of less than first class-man. If this little book helps any considerable number of our people to learn how to shoot, it will have filled its mission.



Now

Gas. A. Moss.

Camp Gaillard, Canal Zone,
November 26, 1916.

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CHAPTER I

HOW TO SHOOT¹

Value and importance of shooting straight. The value of a soldier as a fighting man is measured by his ability to shoot straight. If you can't shoot, you have no business on the firing line,—you merely take up room without accomplishing anything. In other words, you are in the way, and would be better off at home where you would not be risking your life unnecessarily, and would not be a useless burden to your officers.

From every standpoint it is to your advantage to learn to shoot. Not only does it mean more pay to you,² but it may some day mean more to you than all the riches in the world,—*it may save your life.*

If you ever go into battle, the consciousness that you can shoot as well as the other fellow, if not even a little better, will give you a comforting feeling of confidence that will mean more to you than all the extra pay you may have gotten for qualification in marksmanship. This comforting feeling of confidence will repay you a thousand times over for all the time, care and patience that you may have devoted to making yourself a good shot.

Remember, although you may not actually hit the other fellow, if you can shoot straight enough to make your bullets pass close to him, you will make him so

¹The author is indebted to Capt. John W. Lang, 29th Inf., for valuable assistance in the preparation of this chapter.

²If you qualify as marksman, you get \$2 a month extra; as sharpshooter, \$3; as expert rifleman, \$5.

nervous that he will drop down behind cover and quit shooting, or his shots will all go wild.

Any man of normal eyesight and fair intelligence can, with determination and proper instruction, become a fair shot if not an excellent one.

Factors that enter into shooting. While there are a number of factors, some very important, others less so, that enter into shooting (for example, effect of light and wind, hold of piece, trigger squeeze, physical condition, etc.), none of them is especially difficult, and they can all be mastered by *determination and practice*.

Getting out of the rifle all there is in it. Our rifle is the best and most accurate rifle in the world.

There are certain things that it is capable of doing, *that it can be made to do*.

Whether the soldier can make his rifle do what it is capable of doing,—whether he can get out of it everything there is in it (all the hidden 4's and 5's),—whether he can make it come pretty nearly doing what he wants it to do,—depends upon the soldier's *determination and instruction*.

In other words, with his officers and noncommissioned officers to instruct him, it is entirely up to the soldier himself as to whether or not he becomes at least a marksman.

The trajectory. As the bullet passes through the air it makes a curved line something like this:

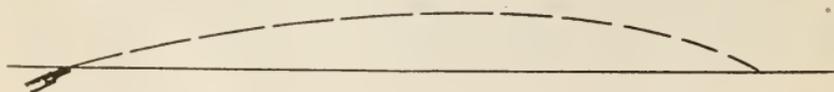


FIG. 1

This curved line is called the *trajectory*.

The resistance of the air and the force of gravity (the force that pulls all bodies toward the earth), are the two things that make the path of the bullet a curved line, just the same as they make the path of the baseball thrown by the player a curved line.

The resistance of the air holds the bullet back and the force of gravity pulls it down, so that the two acting together make the bullet's path curved.

The longer the range the more will the path of the bullet (the trajectory) be curved, as shown by the following drawing:

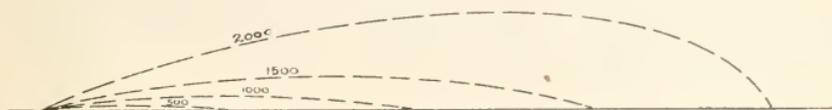


FIG. 2

The principle involved is the same as that involved in throwing a baseball. For example, if you throw a baseball very hard from third to first base, you can make it reach first base in almost a straight line, without going very high in the air, but if you wanted to throw the ball home from the outfield, you would have to throw it pretty high in order to get it there and its path (trajectory) would be curved very much. In other words, you've got to make allowance for the resistance of the air and the force of gravity.

An expert ball player knows, through practice, just how high it is necessary to throw a ball in order for it to reach certain points. A beginner does not know.

Sighting or Aiming. Now, on the rifle there are two "sights,"—the *front sight* and the *rear sight*,—which

enable the rifleman to regulate the path of the bullet, as the ball player regulates the path of the ball.

If the ball player wants distance, he throws the ball high (raises the path, the trajectory), using his eye and guesswork, and likewise if the rifleman wants to shoot at a distant target, he, too, shoots the bullet high (that is, he raises the muzzle of his rifle), but he doesn't have to depend upon guesswork. It is all worked out for him by experts and all he need do is to set the *rear sight* for the proper range,—that is, for the distance the object is from him.

Aiming or sighting a rifle consists in bringing into line three objects: The *target*, A, the *front sight*, B, and the *rear sight*, C.

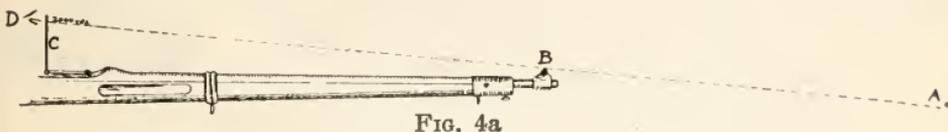
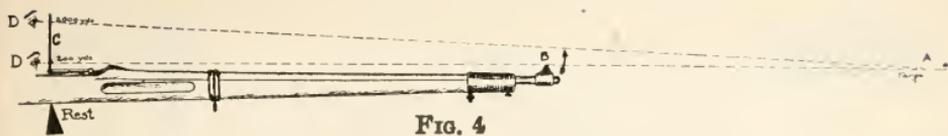


FIG. 3

The rifle is so made and the sights placed on it in such a way that when the piece is held in such a position that the *target*, the *front sight* and the *rear sight* are in line, and the trigger is pulled (squeezed) the bullet will strike the *target*.

You raise the muzzle of the piece by raising the rear sight,—that is, raising the rear sight has the effect of raising the muzzle, for the higher you raise the rear sight the higher must you raise the muzzle in order to see the front sight and get it in line with the object aimed at and the rear sight.

This is shown in the following illustrations:



The rear sight, C, the front sight, B, and the bull's eye, A, are all on a line with the eye, D, the rear sight being set for 200 yards.

Suppose we wanted to shoot at 2000 instead of 200 yards. We would raise the slide up to 20 (2000 yards) on the sight leaf.

In order to see the bull's eye through the notch sight at 2000, we must raise the eye to the position, D. We now have the rear sight, the bull's eye and the eye in line, but we must bring the front sight in line with them, which is done by raising the muzzle of the piece, giving the result shown in Fig. 4a.

Line of sight. With the open sight the line of sight is determined by a point on the middle line of the notch of the rear sight and the top of the front sight.

With the peep sight, the line of sight is determined by the *center* of the peep and the top of the front sight.

Different kinds of sights. The different kinds of sights are as follows:

Open sight. By *open sight* is meant the use of any one of the *sighting notches*.

To use the open sight:



FIG. 5

1. Look through the sighting notch at the target. (Fig. 5.)

2. Bring the top of the front sight on a line with the top and in the center of the sight notch, the top of the front sight being just under the bull's eye.



FIG. 6

Because of its wide field of view and its readiness in getting a quick aim with it, the open sight is the one that is generally used in the later stages of battle, or when fire is to start immediately.

The following positions of the front sight are *incorrect*:

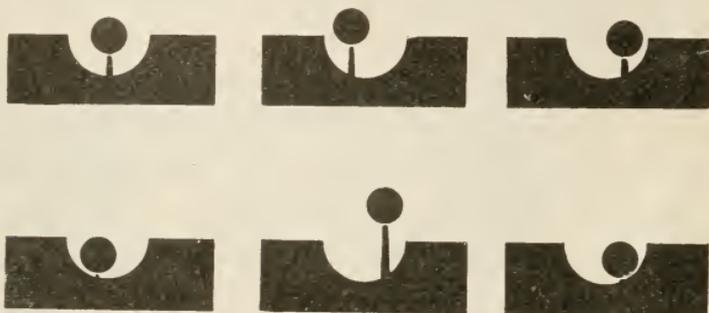


FIG. 6a

Peep sight. By *peep sight* is meant the use of the *peep hole* in the drift slide.

To use the *peep sight*:

1. Look through the peep hole at the target. (Fig. 7.)

2. Bring the top of the front sight to the center of the peep hole, the top of the front sight being just under the bull's eye. (Fig. 8.)



FIG. 7

Be sure to get the top of front sight, as in Fig. 8, and not the bull's eye, as in Fig. 9, in center of the peep hole.



FIG. 8
Correct



FIG. 9
Incorrect

Advantage of the peep sight. The advantage of the peep sight over the open sight is due to the fact that it is easier to center the top of the front sight in the peep hole and thus get the same amount of front sight each time.

For example, you know at once, without measuring, that the dots in the circles, Fig. 10, are not cen-



FIG. 10



FIG. 11

tered, and that the one in the circle in Fig. 11, is. After a little practice, in looking through the peep hole the eye almost automatically centers the top of the front sight.

Disadvantage of the peep sight. The disadvantage of the peep sight is that its limited field of view and lack of readiness in getting a quick aim with it limit its use to those stages of the combat when comparative deliberation will be possible.

What the rifleman looks at when he fires. The eye can be focused accurately upon objects at only one distance at a time; all other objects we see will be more or less blurred and fuzzy looking, depending upon their distance from the object upon which our eye is focused. Hold your finger up and look at it. You will see your finger clearly,—the rest of the hand and the arm will be more or less blurred,—objects about you will be seen

only indistinctly. Hold your hand in place, but focus your eye on some object beyond your finger on a line with your finger and your eye. You will still see your finger but it will now be fuzzy and indistinct.

In shooting we have three points which are placed in a line—the rear sight, the front sight and the target. It is impossible to focus the eye on all three at the same time. One must be chosen.

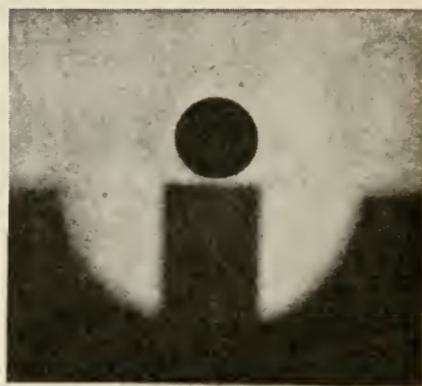
Which shall we choose?

The following illustrations show the appearance of the bull's eye, depending upon whether the eye is focused on the front sight, rear sight or bull's eye.

In Fig. 12 the eye is focused on the *bull's eye*. Notice how clear cut and distinct it is, and the blurring of the front and rear sights.



Peep normal sight



Open normal sight

FIG. 12

In Fig. 13 the eye is focused on the *front sight*. Notice how clear cut and distinct it is, and the blurring of the bull's eye.

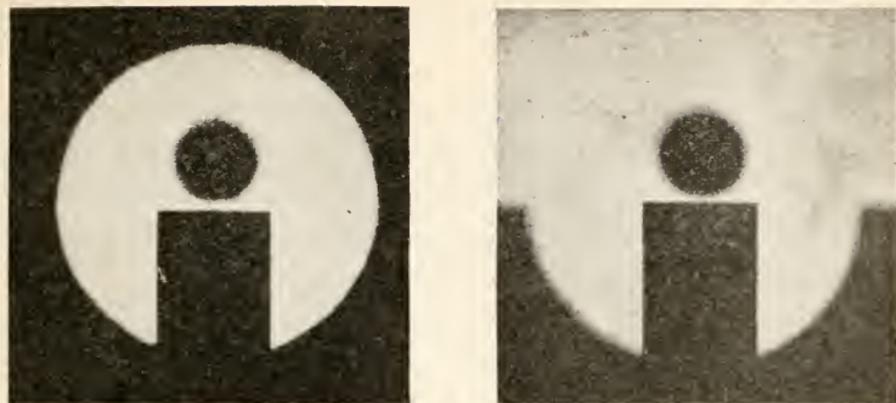


FIG. 13

In Fig. 14 the eye is focused on the *rear sight*. Notice how clear cut and distinct it is, and how blurred the front sight and the bull's eye are.

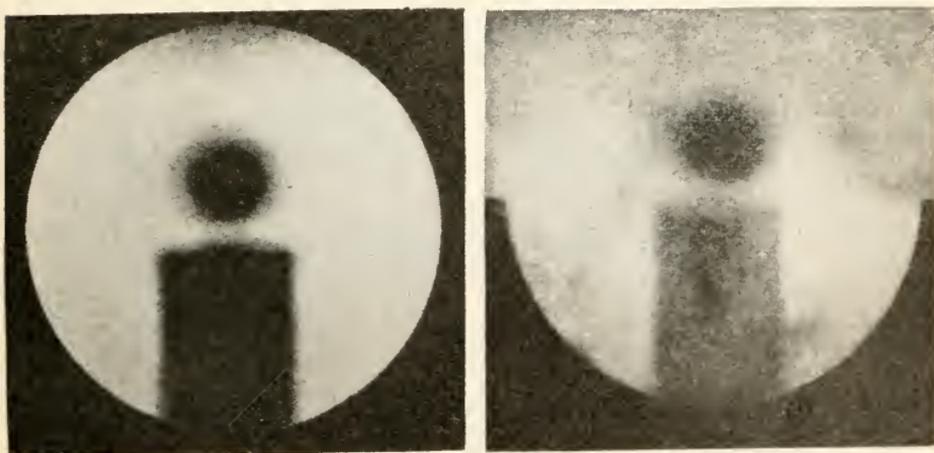


FIG. 14

The rifleman who attains proficiency *focuses his eye on the target while aiming*, but he glances at one sight and then the other to see that they are aligned properly,

then back at the target, and at the instant of discharge *his eye is on the target.*

Blurring is best overcome by using the peep sight, which may be compared to looking through a round window,—whatever blurring there is will be uniform and concentric and we can still center the **TOP OF THE FRONT SIGHT** without difficulty.

Normal sight. The amount of front sight taken in Figs. 12, 13 and 14, is called the normal sight and is the one that the soldier should always use, either with the open notch or peep sight, as it is the only sight which assures the taking of the same amount of front sight every time. In other words, it assures a greater degree of *uniformity* in sighting, which is one of the most important factors in shooting. By uniformity in sighting is meant taking the same amount of sight each time.

If you take *less* than the amount of front sight used in the normal sight, it will, of course, have the effect of *lowering* the muzzle of the piece, and consequently you will hit a point *lower* than if you had used the normal sight.

On the other hand, if you take *more* than the amount of front sight used in the normal sight, it will, of course, have the effect of *raising* the muzzle and consequently you will hit a point *higher* than if you had used the normal sight.

Fine sight. Although occasionally a man will be found who can get good results by using the fine sight, the average man cannot, and this form of sighting is, therefore, to be avoided.



FIG. 15
Fine sight

Full sight. The so-called *full sight* must be avoided under all circumstances. It is merely mentioned and shown here to point out a fault that must be carefully avoided.



FIG. 16
Full sight

The objections to its use are the same as in the case of the fine sight,—that is, lack of uniformity in the amount of sight taken.

Battle sight. By *battle sight* we mean the position of the rear sight with the leaf down. There is a sighting notch on the top of the leaf, or rather on top of the leaf slide which works up and down the leaf.

The battle sight is the only sight used in *rapid fire*. In unexpected, close encounters the side that first opens a rapid and accurate fire has a great advantage over the other. Again, a soldier on patrol generally has no time to set his sight, if suddenly attacked at close range. The battle sight, may, therefore, be called the *emergency sight*,—the *handy, quick sight*. The soldier should, therefore, become thoroughly familiar with the use of this sight.

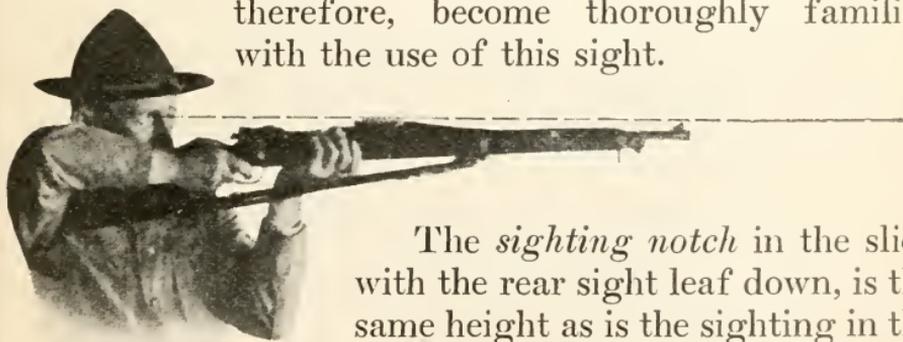


FIG. 17
Battle sight

The *sighting notch* in the slide with the rear sight leaf down, is the same height as is the sighting in the drift slide when the rear sight leaf is raised and set at 530 yards.

That is to say, *battle sight* is equivalent to a sight setting of 530 yards. Therefore, in shooting with battle sight at objects nearer than 530 yards you must aim lower.

The following shows the trajectory of the bullet when *battle sight* is used:



FIG. 18

That is to say, if you were aiming with the battle sight at an object 530 yards away, the bullet would pass 25 inches above an object of the same height at 200 yards, 28 inches above at 300, 23 inches above at 400, and 7 inches above one at 500, which is only another way of saying if shooting with battle sight at an object 200 yards away, you must aim 25 inches (about 2 feet) below the object in order to hit it; if at 300 yards, 28 inches ($21\frac{1}{2}$ feet below); if at 400 yards, 23 inches (about 2 feet) below; and if at 500 yards, 7 inches (about $\frac{1}{2}$ foot) below.

Remember that in the case of the battle sight, the position of the slide is immaterial, except as regards accuracy in sighting,—that is, it is immaterial whether the slide is well forward or well back. However, as regards accuracy in sighting, the position of the slide does make a difference, for the greater the distance between the front and rear sights, the more accurate will the sighting be. Hence, the slide should always be as far back as possible.

SIGHTING, POSITION AND AIMING DRILLS

The importance of the following sighting, position and aiming drills cannot be overestimated. If they are carefully practiced, before firing a single shot at a tar-

get, you will have learned how to aim your piece correctly, hold your rifle steadily, squeeze the trigger properly, assume that position best adapted to the particular conformation of your body, and you will also have acquired the quickness and manual skill required for handling the piece in rapid fire.

The sighting, position and aiming drills teach the fundamental principles of shooting, which are the foundation upon which marksmanship is built.

Do not confine yourself to going through these drills only during drill hours, but go through them frequently at other times. The extent to which it will improve your shooting will more than repay you for your trouble.

SIGHTING DRILLS

Object. The objects of the sighting drill are:

1. To show how to bring the rear sight, the front sight and the target into the same line,—that is, to show how to sight properly.

2. To discover and point out errors in sighting,—in other words, to discover the errors you make in sighting and show the reasons for same, so that you may be able to correct them properly.

3. To teach uniformity in sighting,—that is, to teach you how to take the same amount of sight each time,—to see every time the same amount of front sight when you look through the rear sight.

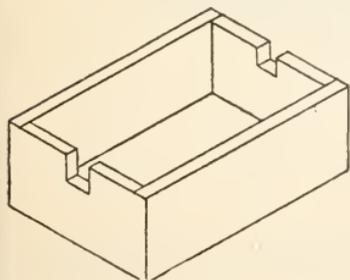


FIG. 19

Sighting rest for rifle. A good sighting rest for a rifle may

be made by removing the top from an empty pistol ammunition box, or a similar box, and then cutting notches in the ends of the box to fit the rifle closely. (Fig. 19.)

Place the rifle in these notches with the trigger guard close to and outside one end.

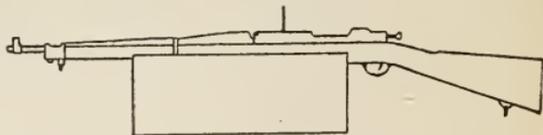


FIG. 19a

At a convenient distance above the ground fasten a blank sheet of paper on a wall or on a plank nailed to a stake driven into the ground.

Three legs are fastened to the rest (or it may be placed on the

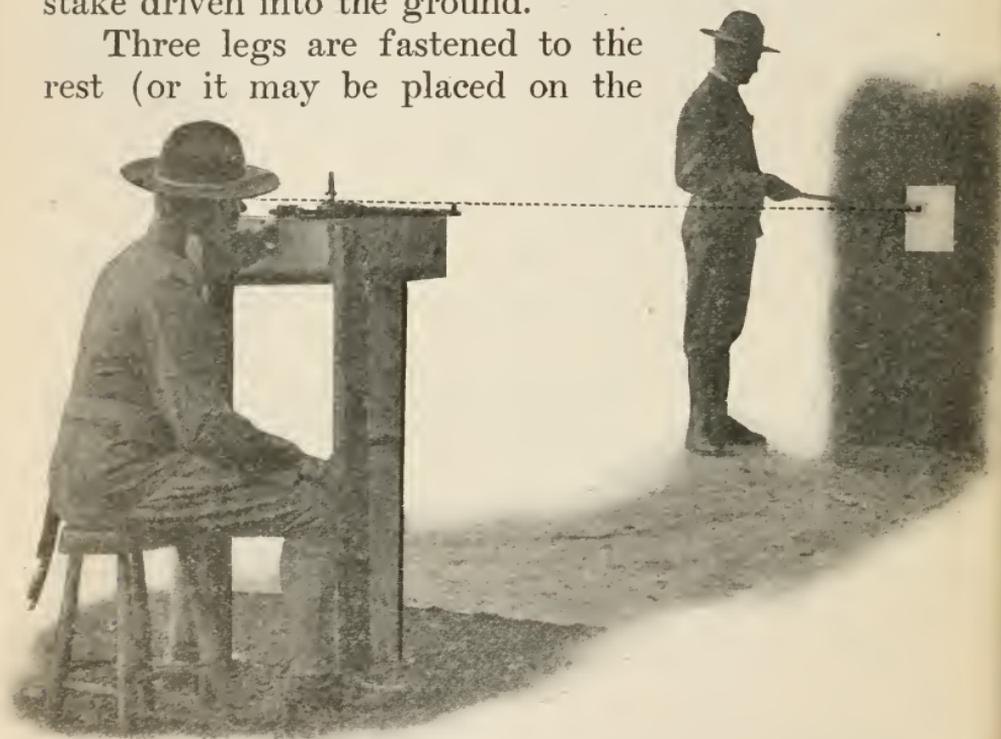


FIG. 20

ground without any legs), which is placed 20 or 30 feet from the blank sheet of paper.

Make sure that the piece is canted neither to the right nor left, and without touching the rifle or rest, sight the rifle near the center of the blank sheet of paper. (Fig. 20.)

Changes in the line of sight are made by changing the elevation and windage.

A soldier acting as marker is provided with a pencil and a small rod

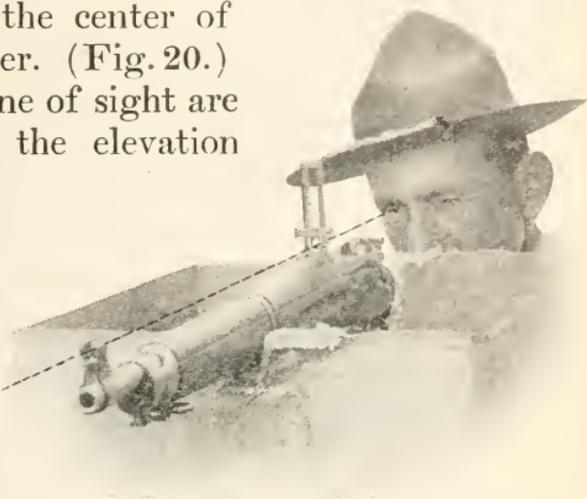


FIG. 21

bearing at one end a small piece of white cardboard, with a black bull's-eye, pierced in the center with a hole just large enough to admit the point of a lead pencil.

The soldier sighting directs the marker to move the disk to the right, left, higher, or lower, until the line of aim is established when he commands, "Mark," or "Hold."

At the command "Mark," being careful not to move the disk, the marker records through the hole in the center the position of the disk and then withdraws it.

At the command "Hold," the marker holds the disk carefully in place without marking, until the position is verified by the instructor, and the disk is not withdrawn until so directed.

Point of Aim. Always be sure to aim at a point just below the black bull's-eye,—that is, aim so that

there will be a fine line of light between the bottom of the bull's-eye and the top of the front sight (Fig. 22). This is important to insure uniformity in sighting,—that is, in order to make sure that the same amount of the front sight is taken each time. If the top of the front sight touches the bottom of the bull's-eye it is impossible to say just how much of the front sight is seen.



FIG. 22

First Sighting Exercise

Using the sighting rest for the rifle (Fig. 20, page 24) require each man to direct the marker to move the disk until the rifle is directed on the bull's-eye with the *normal* sight and command, "Hold." If aiming correctly the rear sight, the front sight and the bull's-eye will look as shown in Fig. 22, above.

The instructor then verifies this line of sight. Errors, if any, will be pointed out to the soldier and another trial made. If he is still unable to sight correctly, he will be given as many more trials as may be necessary.

Sometimes a man does not know how to place the eye in the line of sight; he will look over or along one side of the notch of the rear sight and believe that he is aiming through the notch because he sees it at the same time that he does the front sight. Again some men in sighting will look at the front sight and not at the object.



FIG. 23

Repeat the above exercise, using the *peep* sight. If aiming correctly, the rear

sight, the front sight and the bull's-eye will look as shown in Fig. 23.

Second Sighting Exercise

The triangle of sighting. Using the sighting rest for the rifle as before (Fig. 20, page 24), direct the marker to move the disk until the rifle is directed on the bull's-eye with the *normal* sight and command "Mark," whereupon the marker, being careful not to move the disk, records through the hole in its center, the position of the disk, and withdraws it. Then, being careful not to move the rifle or sights repeat the operation until three marks have been made.

Join the three points by straight lines. The shape and size of the triangle will indicate the nature of the variations made in sighting.

For example, if you have taken the same aim each time, you will get a very small triangle something like this:

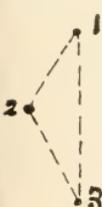


FIG. 26

which resulted from taking each

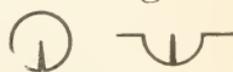
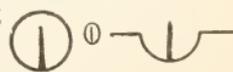


FIG. 25

A triangle like Fig. 26 results from not taking the same amount of front sight each time, as shown in Fig.



27.

A triangle like Fig. 28 shows that the front sight was not in the middle of the notch



FIG. 28

each time, as shown in Fig. 29.



FIG. 27

A triangle like Fig. 30 results from a combination of the two errors mentioned above,—that is, not taking the same amount of front sight each time and not having the front sight in the middle of the notch each time, as shown in Fig. 31.

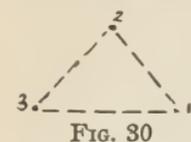


FIG. 30

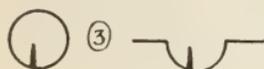
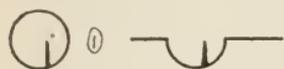


FIG. 31

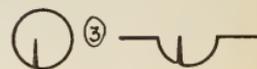
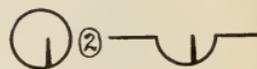
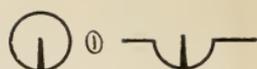


FIG. 29

If any one of the sides of the triangle is longer than one-half inch, the exercise is repeated, each sight being verified by the instructor, who will call the soldier's attention to his errors, if any.

The smaller the triangle, the better the sighting.

Verifying the triangle. If the sides of the triangle are so small that they indicate regularity in sighting, mark the center of the triangle and then place the center of the bull's-eye on this mark. The instructor then examines the position of the bull's-eye with reference to the line of sight. If the bull's-eye is properly placed with reference to the line of sight, the soldier aims correctly and with uniformity.

If the bull's-eye is not properly placed with reference to the line of sight, the soldier aims in a regular manner but with a constant error.

Causes of errors. If the bull's-eye is directly above its proper position, the soldier has aimed high,—that is, he has taken too little front sight.

If the bull's-eye is directly below its proper position, the soldier has aimed low,—that is, he has taken too much front sight.

If the bull's-eye is directly to the right or left of its proper position, the soldier has not sighted through the center of the rear notch and over the top of the front sight. If to the *right*, the soldier has either sighted along the *left* of the rear sight notch or the *right* side of the front sight, or has committed both of these errors.

If the bull's-eye is to the *left* of its proper place, the soldier has probably sighted along the *right* of the rear sight notch, or to the *left* of the front sight, or has committed both of these errors.

If the bull's eye is diagonally above and to the right, the soldier has probably combined the errors which placed it too high and too far to the right.

Any other diagonal position would be produced by a similar combination of vertical and horizontal errors.

After the above instruction has been given to one man, the line of sight will be slightly changed by moving the sighting rest or by changing the elevation and windage, and the exercises similarly repeated with other men.

Repeat the exercise, using the *peep* sight.

Third Sighting Exercise

This exercise shows the effect of canting the piece.

It is most important that in aiming the sights be kept vertical and the piece not be canted,—that is, that the barrel be not tilted over to the right or left.

If the piece is canted to the right, the sights are lowered to the right and consequently the bullet will strike to the right and below the point aimed at, even

though the rifle be otherwise correctly aimed and the sights correctly set.

Similarly if the piece is canted to the left the sights are lowered to the left, and consequently the bullet will strike to the left and low.

This effect of canting the piece may be shown as follows: Use the sighting rest with the rifle firmly held in the notches, the bolt removed.

Paste a black paster near the center of the bottom line of the target. Sight the rifle on this mark, using about 2000 yards' elevation. Then, being careful not to move the rifle, look through the bore and direct the marker to move the disk until the bull's-eye is in the center of the field of view and command, "Mark."

Next, turn the rest (with the rifle) over 90° to the right, on its side, and with the same elevation, sight on the same paster as above. Then, being careful not to move the rifle, look through the bore and again direct the marker to move the disk until the bull's-eye is in the center of the field of view and command, "Mark."

Not considering the fall of the bullet, the first mark represents the point struck with the sight vertical, the second mark represents the point struck, low and to the right, using the same elevation and the same point of aim, when the piece is canted 90° to the right.

Different degrees of canting the piece can be represented by drawing an arc of a circle through the two marks with the paster as a center. The second mark will be at a point on this arc corresponding to the degree of canting the piece.

It is important to know that this effect of canting increases with the distance from the target.

Fourth Sighting Exercise

This exercise is to show the advantage of blackened sights.

In strong sunlight, make a triangle of sighting, using a rifle having sights worn bright. Then, being careful not to move the rifle, blacken the sights and make another triangle.

Use dotted lines for the triangle with bright sights and full lines for the triangle made with blackened sights.

The position and size of the two triangles will plainly show the advantage of using blackened sights.

Fifth Sighting Exercise

This exercise is to illustrate the importance of knowing the effects of varying degrees of light.

In strong sunlight make a triangle of sighting. Then, being careful not to move the piece, make another triangle, the target and the man sighting having first been shaded.

The relative positions of the triangles will show the importance of knowing the effects of varying degrees of light.

POSITION AND AIMING DRILLS

Object. The object of the position and aiming drills are:

1. To so educate the muscles of the arm and body that the piece, during the act of aiming, shall be held without restraint, and during the operation of firing shall not be deflected from the target by any convulsive or improper movement of the trigger finger or of the body, arms, or hands.

2. They also establish between the hand and eye such prompt and intimate connection as will insure that the finger shall act upon the trigger, giving the final pressure at the exact moment when the top of the front sight is seen to be directed upon the mark.

3. If at the moment the piece is discharged, it is properly supported and correctly aimed, the mark will surely be hit.

Since any fairly intelligent man can be taught to aim correctly and to hold the sights aligned upon the mark with a fair amount of steadiness, it follows that bad shooting must necessarily arise from causes other than bad aiming. The chief of these causes is known to be the deflection given to the rifle when it is discharged, due to the fact that the soldier, at the moment of firing, instead of SQUEEZING the trigger, *jerks* it. This convulsive action is largely due to lack of familiarity with the methods of firing and to a constrained position of the muscles of the body, arm, and hands, which constrained position it is the object of the position and aiming drills to correct.

General. In order to correct any tendency to cant the piece, the rear sight is raised in all the exercises.

Place a black paster at which to aim on the wall opposite each man.

The squad being formed in single rank, with an interval of one yard between files, the instructor directs the men to take the position of "Ready," except that the position of the feet is such as to insure the greatest firmness and steadiness of the body. (Note. Some of our best shots turn the toes in, as in horseback riding, claiming that it stiffens the leg muscles and makes the support much steadier.)

The instructor then cautions, "Position and aiming drill."

The exercise which is being taught should be repeated frequently and made continuous. The instructor prefaces the preparatory command by, "Continue the motion," or "At will," and gives the command "Halt" at the conclusion of the exercise, when the soldier returns to the position of "Ready." Or the soldier may be made to repeat the first and second motions by the command "One," "Two," the exercise concluding with the command "Halt."

Care must be taken by the instructor not to make the position and aiming drills tedious. Thirty minutes daily should be spent in this practice during the period of preliminary instruction. After gallery practice is taken up, however, five or ten minutes daily should be sufficient for these exercises.

In order that the instructor may readily detect and correct errors the squads for these drills should not consist of more than eight men.

The instructor should avoid holding the squad in tiresome positions while making explanations or corrections.

Position Exercise

The instructor commands: 1. *Position.* 2. *Exercise.* At the command, "*Exercise,*" without moving the body or eyes, raise the rifle smartly to the front of the right shoulder to the full extent of the left arm, elbow inclined downward, the barrel nearly hori-

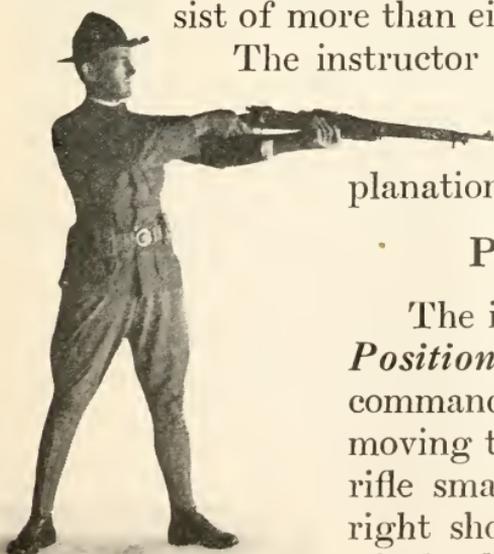


FIG. 32

zontal, muzzle slightly depressed, heel of the butt on a line with the top of the shoulder. (Fig. 32.)

(Two.) Bring the piece smartly against the hollow of the shoulder, without permitting the shoulder to give way, and press the rifle against it, mainly with the right hand, only slightly with the left, the forefinger of the right hand resting lightly against the trigger, the rifle inclined neither to the right nor left.

(Three.) Resume the position of ready. (Fig. 34.)

Remarks. The instructor should especially notice the position of each soldier in this exercise, endeavoring to give to each man an easy and natural position. He should see that the men avoid drawing in the stomach, raising the breast, or bending the small of the back.

The butt of the piece must be pressed firmly, but not too tightly, into the hollow of the shoulder and not against the muscles of the upper arm. If held too tightly, the pulsations of the body will be communicated to the piece; if too loosely, the recoil will bruise the shoulder. If only the heel or toe touches the hollow of the shoulder, the recoil may throw



FIG. 33

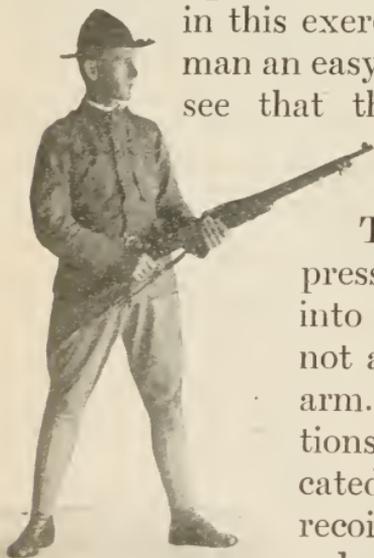


FIG. 34

the muzzle down or up, affecting the position of the hit. While both arms are used to press the piece to the shoulder, the left arm should be used to direct the piece and the right forefinger must be left free to squeeze the trigger.

Aiming Exercise

The instructor will first direct the sights to be adjusted for the lowest elevation and subsequently for the different longer ranges.

The instructor commands: 1. *Aiming.* 2. *Exercise.*

At the last command execute the first and second motion of the position exercise.

(Two.) Bend the head a little to the right, the cheek resting against the stock, the left eye closed, the right eye looking through the notch of the rear sight at a point slightly below the mark. (Fig. 35.)

(Three.) Draw a moderately long breath, let a portion of it escape, then, with the lungs in a state of rest, slowly raise the rifle with the left hand, being careful not to incline the sight to either side, until the line of sight is directly on the

mark; hold the rifle steadily directed on the mark for a moment; then, without command and just before the power to hold the rifle steadily is lost, drop the rifle to the position of "Ready" and resume the breathing.

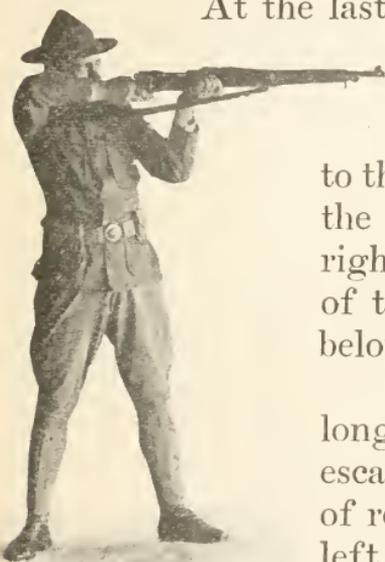


FIG. 35

Remarks. Some riflemen prefer to extend the left arm. Such a position gives greater control over the rifle when firing in a strong wind or at moving objects. It also possesses advantages when a rapid as well as accurate delivery of fire is desired. Whatever the position, whether standing, kneeling, sitting, or prone, the piece should rest on the palm of the left hand, never on the tips of the fingers, and should be firmly grasped by all the fingers and the thumb.

The eye may be brought to the line of sight either by lowering the head or by raising the shoulder; it is best to combine somewhat these methods; the shoulder to be well raised by raising the right elbow and holding it well to the front and at right angles to the body.

If the shoulder is not raised, it will be necessary for the soldier to lower the head to the front in order to bring the eye into the line of sight. Lowering the head too far to the front brings it near the right hand, which grasps the stock. When the piece is discharged, this hand is carried by the recoil to the rear and, when the head is in this position, may strike against the nose or mouth. This often happens in practice, and as a result of this blow often repeated many men become gun-shy, or flinch, or close their eyes at the moment of firing. Much bad shooting, ascribed to other causes, is really due to this fault. Raising the right elbow at right angles to the body elevates the right shoulder, and lifts the piece so that it is no longer necessary to incline the head materially to the front in order to look along the sights.

As the length of the soldier's neck determines greatly the exact method of taking the proper position, the in-

structor will be careful to see that the position is taken without restraint.

Always be sure to hold the thumb along the small of the stock, as shown in Figs. 41-46; for, if the face is struck the thumb is the usual offender.

As changes in the elevation of the rear sight will necessitate a corresponding change in the position of the soldier's head when aiming, the exercise should not be held with the sight adjusted for the longer ranges until the men have been practiced with the sights as the latter would generally be employed for offhand firing.

The soldier must be cautioned that while raising the line of sight to the mark he must fix his eyes on the mark and not on the front sight; the latter can then be readily brought into the line joining the rear-sight notch and mark. If this plan be not followed, when firing is held on the range at long distances the mark will generally appear blurred and indistinct. The front sight will always be plainly seen, even though the eye is not directed particularly upon it.

The rifle must be raised slowly, without jerk, and its motion stopped gradually. In retaining it directed at the mark, care must be taken not to continue the aim after steadiness is lost; this period will probably be found to be short at first, but will quickly lengthen with practice. No effort should be made to prolong it beyond the time that breathing can be easily restrained. Each soldier will determine for himself the proper time for discontinuing the aim.

The men must be cautioned not to hold the breath too long, as a trembling of the body will result in many cases.

Some riflemen prefer, in aiming, to keep both eyes open but, unless the habit is fixed, the soldier should be instructed to close the left eye.

Trigger-Squeeze Exercise

The instructor commands: 1. *Trigger squeeze.*
2. **Exercise.** At the command **Exercise**, the soldier executes the first motion of the aiming exercise.

(Two.) The second motion of the aiming exercise.

(Three.) Draw a moderately long breath, let a portion of it escape, hold the breath and slowly raise the rifle with the left hand until the line of sight is on the mark, being careful not to incline the sights to either side. Take up the trigger slack, and then contract the trigger finger gradually, *contracting all the muscles of the whole hand*, slowly and steadily increasing the pressure on the trigger, while the aim is being perfected; continue the gradual increase of pressure so that when the aim has become exact the additional pressure required to release the point of the sear can be given almost insensibly and without causing any deflection of the rifle. Continue the aim a moment after the release of the firing pin, observe if any change has been made in the direction of the line of sight, and then resume the position of "Ready," cocking the piece by raising and lowering the bolt handle.

Remarks. Poor shooting is often the result of lack of proper coördination of holding the breath, the maximum steadiness of aim, and the squeeze of the trigger. By frequent practice in this exercise, each man may come to know the exact instant his firing pin will be released. He must be taught to hold the breath, bring

the sights to bear upon the mark, and squeeze the trigger all at the same time.

The Trigger Squeeze. The trigger should be *squeezed*, not pulled, the hand being closed upon itself as a sponge is squeezed, the forefinger sharing in this movement, remembering that the trigger slack must always be taken up before you begin to squeeze.

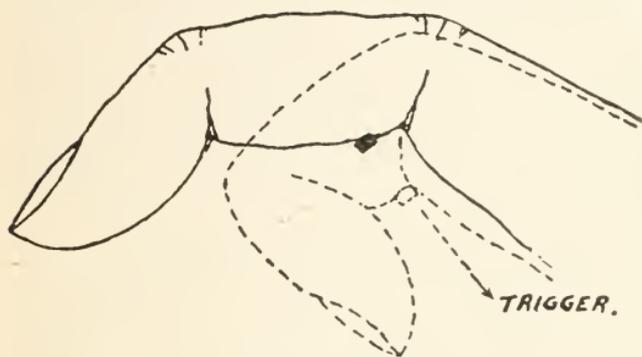


FIG. 36

The forefinger should be placed as far around the trigger as to *press* it with the second joint. By practice the soldier becomes familiar with the trigger *squeeze* of his

rifle, and knowing this, he is able to judge at any time, within limits, what additional *pressure* is required for its discharge. By constant repetition of this exercise he should be able finally to *squeeze* the trigger to a certain point beyond which the slightest movement will release the sear. Having *squeezed* the trigger to this point, the aim is corrected and, when true, the additional pressure is applied and the discharge follows.

Rapid-Fire Exercise

Object. The object of this exercise is to teach the soldier to aim quickly and at the same time accurately in all the positions he will be called upon to assume in range practice.

The instructor commands: 1. *Rapid-fire exercise.*
2. **Commence Firing.** At the first command the first

and second motions of the trigger-squeeze exercise are performed. At the second command, the soldier performs the third motion of the trigger-squeeze exercise, squeezing the trigger without disturbing the aim or the position of the piece, but at the same time without undue deliberation. He then, without removing the rifle from the shoulder, holding the piece in position with the left hand, grasps the handle of the bolt with the right hand, *turns both hands toward each other*, rapidly draws back the bolt, closes the chamber, aims and again squeezes the trigger. This movement is repeated until the trigger has been squeezed five times, when, without command, the piece is brought back to the position of "Ready."

When the soldier has acquired some facility in this exercise, he will be required to repeat the movement ten times, and finally, by using dummy cartridges, he may, by degrees, gain the necessary quickness and dexterity for the execution of the rapid fire required in range firing.

Methods. The methods of taking position, of aiming, and of squeezing the trigger, taught in the preceding exercises, should be carried out in the rapid-fire exercise, with due attention to all details taught therein; the details being carried out as prescribed except that greater promptness is necessary. In order that any tendency on the part of the recruit to slight the movements of aiming and of trigger squeeze shall be avoided, the rapid-fire exercise will not be taught until the recruit is thoroughly drilled and familiar with the preceding exercises. The recruit will be instructed that with practice in this class of fire the trigger can be squeezed promptly without deranging the piece.

Repetition. If the recruit seems to execute the exercise hurriedly or carelessly, the instructor will require him to repeat it at a slower rate.

Manipulation of the Breech Mechanism. To hold the piece to the shoulder and, at the same time, manipulate the breech mechanism with the proper facility, are learned only after much practice. Some riflemen, especially men who shoot from the left shoulder, find it easier, in rapid firing, to drop the piece to the position of load after each shot. While at first trial this method may seem easier, it is believed that, with practice, the advantage of the former method will be apparent.

Position and Aiming Drill, Kneeling

These exercises will be repeated in the kneeling position by causing the squad to kneel by the commands prescribed in the Drill Regulations. The exercises will be executed as prescribed for standing, except that at the command "Two" in the position exercise, the soldier will rest the left elbow on the left knee, the point of the elbow in front of the kneecap. The pasters for the kneeling exercise should be at $2\frac{1}{2}$ feet from the floor or ground.

Remarks. Frequent rests will be given during practice in these exercises kneeling, as the position, if long continued, becomes constrained and fatigues the soldier unnecessarily.

In raising the rifle to the mark in the second and third exercises, the position of the left hand should not be changed, but the left forearm should be brought toward the body and at the same time the body bent slightly to the rear.

When aiming kneeling there is, from the nature of the position, a tendency to press the butt of the rifle against the upper arm instead of against the hollow of the shoulder; this will necessitate inclining the head considerably to the right to get the line of sight, and by bringing the rifle so far to the rear will, if the thumb is placed across the stock, cause it to give by the recoil a blow upon the nose or mouth.

These difficulties may be avoided by advancing the right elbow well to the front, at the same time raising it so that the arm is about parallel with the ground. The hollow of the shoulder will then be the natural place for the rifle butt, and the right thumb will be brought too far from the face to strike it in the recoil.

Some riflemen prefer, by bending the ankle, to rest the instep flat on the ground, the weight of the body coming more on the upper part of the heel; this obviates any tendency of the right knee to slip; or, by resting the right side of the foot on the ground, toe pointing to the front, to bring the weight of the body on the left side of the foot. These positions are authorized.

Choice of Position. In firing kneeling, the steadiness obtained depends greatly upon the position adopted. The peculiarities of conformation of the individual soldier exert when firing kneeling a greater influence than when firing either standing, sitting, or prone; the instructor should, therefore, carefully endeavor, noticing the build of each soldier, to place him in the position for which he is best adapted and which will exert the least tension or strain upon the muscles and nerves. It should be remembered, however, that without the rest of the left elbow on the knee this position possesses no advantage of steadiness over the standing position.

Kneeling Position; When Taken. The kneeling position can be taken more quickly than either the sitting or the prone position. It is, therefore, the position naturally assumed when a soldier, who is standing or advancing, has to make a quick shot at a moving or disappearing object and desires more steadiness than can be obtained standing.

Position and Aiming Drill, Sitting Down

In many cases the men, while able to kneel and hold the piece moderately steady, can obtain in a sitting position much better results. All should, therefore, be instructed in aiming sitting down as well as kneeling.

To practice the soldier in the preceding exercises in a sitting position, the squad being formed in a single rank, with an interval of one pace between files, the rifle should first be brought to "Order arms"; the instructor then commands: *Sit down.*

At this command make a half face to the right and, assisted by the left hand on the ground, sit down, facing slightly to the right, the left leg directed toward the front, right leg inclined toward the right, both heels, but not necessarily the bottoms of the feet, on the ground, the right knee slightly higher than the left; body erect and carried naturally from the hips; at the same time drop the muzzle of the piece to the front, and to the position of the first motion of load, right hand upon the thigh, just in front of the body, the left hand slightly above, but not resting upon, the left leg.

The exercise will be executed as heretofore prescribed, except that at the command "Two" (position exercise) the soldier will rest the left elbow on the left

knee, the point of the elbow in front of the kneecap, and the right elbow against the left or inside of the right knee, at the same time inclining the body from the hips slightly forward.

For the aiming and trigger-squeeze exercises the pasters, used as aiming points, will be $2\frac{1}{2}$ feet from the floor or the ground.

To afford the men rest or on the completion of the kneeling or sitting down exercises the instructor will command *Rise*, when the men rise, face to the front, and resume the "Order arms."

Remarks. If the preceding position is carefully practiced, steadiness is quickly attained. The right leg should not be carried so far to the right as not to afford a good support or brace for the right elbow.

This position may be modified, but, in general, not without impairing the steadiness of the man, by crossing the legs at the ankle, the outside of each foot resting upon the ground, body more erect, and the knees slightly more raised than in the previous position.

Position and Aiming Drill, Prone

From the nature of the position it is not practicable to execute these exercises according to the method followed when standing or kneeling. Instruction will, however, always be given with reference to the position, to the manner of assuming it, and to aiming and squeezing the trigger.

For this purpose the squad being formed as specified above, in the position and aiming drill, sitting down (the black plasters therein mentioned being about 12 inches from the ground), the squad will be brought to "Order arms."

Then (the squad either standing or kneeling), the instructor commands: *Lie down*, which will be executed as prescribed in the Drill Regulations; the legs may be spread apart and the toes turned out if found to give a steadier position.

After the squad has taken the position as prescribed above, the legs should be inclined well to the left, and either crossed or separated as the soldier prefers or as his particular conformation appears to render most desirable, and the body at the same time inclined slightly to the right.

With care and practice the soldier may acquire an easy position which he is able to assume with great facility.

Being at "Ready," the instructor then commands:
1. *Trigger squeeze.* 2. *Exercise.*

At the latter command carry the left elbow to the front and slightly to the right, the left hand under the barrel at the balance, weight of the body mainly supported by the left elbow, the right resting lightly on the floor or ground.

(Two.) Slide the rifle with the right hand through the left hand to the front until the left hand is a little in front of the trigger guard; at the same time raise the rifle with both hands and press it against the hollow of the shoulder.

(Three.) Direct the rifle upon the mark and carry out the further details of aiming and squeezing the trigger as prescribed in the trigger-squeeze exercise.

Then resume the position, lying down.

As soon as the men have acquired with accuracy the details of the position, they will be practiced, without

the numbers, in aiming and squeezing the trigger at will; after which the rapid-fire exercise in the prone position will be practiced, the necessary skill and dexterity being acquired by degrees.

To afford the men rest, or on completion of the exercise, the instructor will command: *Rise*, which is executed as prescribed in the Drill Regulations.

Remarks. The preceding position for firing lying down possesses in a greater degree than any other position the merit of adaptability to the configuration of the ground; it enables the soldier to deliver fire over low parapets or improvised shelters, thus making the best use of cover. The importance of training the soldier in firing from the other positions should not, however, be lost sight of, since from the prone position it will frequently be impossible to see the objective.

Back positions are not authorized.

In the prone position, when aiming, the left elbow should be well under the barrel, the other elbow somewhat to the right, but not so far as to induce any tendency to slip on the floor or ground.

The greater changes in elevation required in first directing the rifle on the object should be given by altering the position of the left hand under the barrel, the slighter changes only by advancing or withdrawing the shoulder.

As the body does not yield to the recoil, as when firing standing or kneeling, the force of recoil, if the rifle is not properly held, may severely bruise the soldier. It is one of the objects of this exercise to so teach him that this will be prevented by assuming a correct position. Care must be exercised that the butt is not brought

against the collar bone. By moving the shoulder slightly to the front or rear, and by moving the right elbow from the body or toward it, each soldier may determine the position in which the shoulder gives to the butt of the rifle the easiest rest. This will probably be the one in which the force of the recoil will be least felt.

The soldier should persist in this exercise until he obtains a position in which he feels no constraint, which will not subject him to bruises from the recoil, and from which the mark appears plainly through the sights. Having secured such a position, he must not change it when firing, as a variation in the points of support of the rifle, the distance of the eye from the rear sight, or the tension of the hold has a decided effect, especially at the longer ranges, upon the location of the point struck.

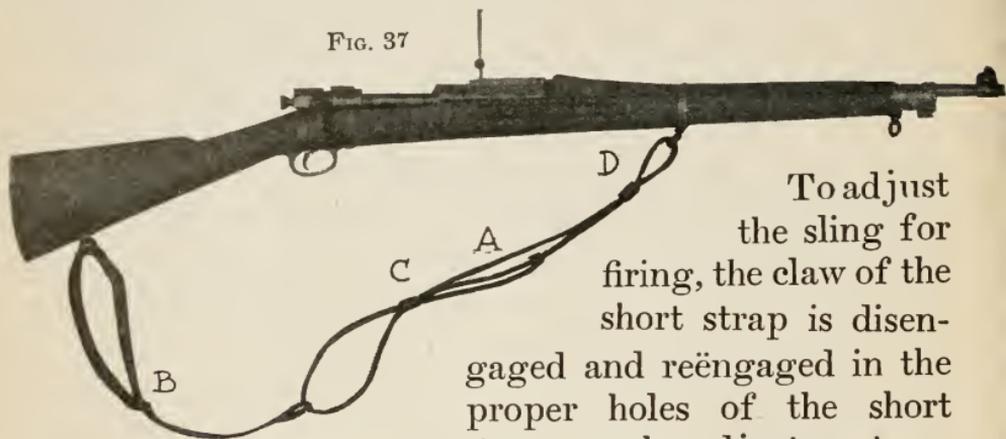
Important. The soldier should be encouraged to go through these exercises frequently at other than drill hours, care being taken that, in the aiming and trigger-squeeze exercises, he always has some definite object for a mark.

Use of sling. After the soldier has been drilled in the proper standing, kneeling, sitting, and prone positions in the foregoing exercises, the use of the sling will be taught. Adjustments and their advantages will be taught with the idea of noninterference with quickness and freedom of action. The trigger-squeeze exercises will then be continued in the different positions, using the sling.

Description and adjustment. The sling is made up of four parts: the long strap, A, forming the arm loop; the stort strap, B; and the two keepers, C and D. At one end of each of the straps there is a metal claw,

used for adjusting the straps. At the other end of the short strap there is a metal loop through which the longer strap is passed, thus connecting the two traps.

FIG. 37



To adjust the sling for firing, the claw of the short strap is disengaged and reëngaged in the proper holes of the short strap, such adjustment as

may be necessary being also made in the long strap (the arm loop).

What the sling does. It does two things: (1) It steadies the rifle, and (2) helps to take up the recoil,—that is, to reduce the “kick.”

Its use. There are a number of different methods of using the sling. Experiment with different ones until you find and decide upon the method best suited to you.

The sling should be used in all firing,—combat practice as well as at target practice.

Always adjust the sling so that it will be tight.

Have the arm loop no longer than is necessary to reach the middle of the small of the stock. When on the arm, have the lower end of the arm loop well up near the arm pit, with the keeper well pressed down so as to hold the loop fast.

Note the proper adjustments of the sling for the different firing positions,—that is, standing, sitting, kneeling, and prone, and mark the adjustments on the inside of the arm loop, “St” (standing), “Si” (sitting, “K” (kneeling), and “P” (prone).

It is sometimes advisable to sew a piece of rope to your shirt sleeve to keep the sling from slipping down.

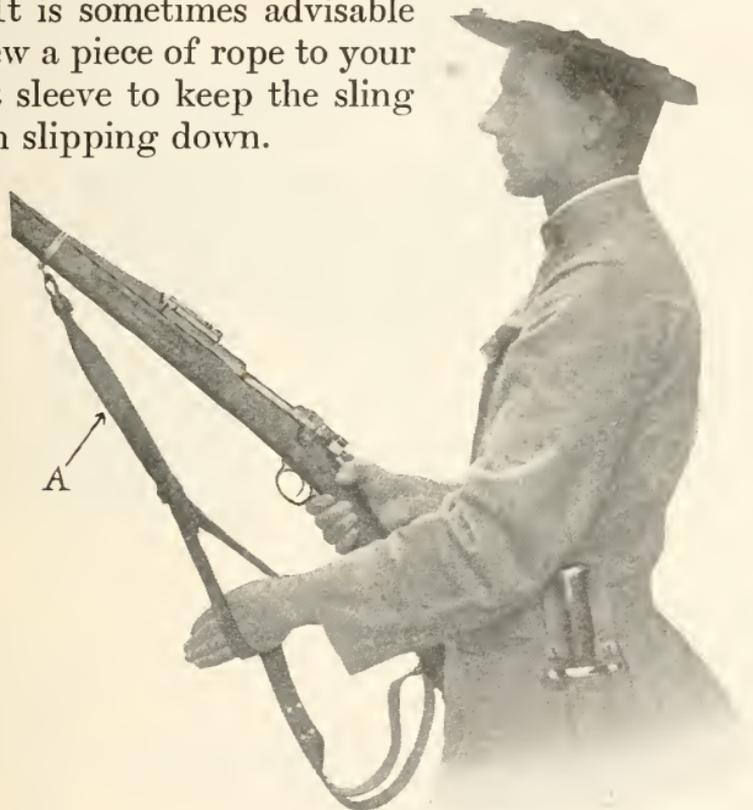


FIG. 38

To put on the sling. 1. Put your left hand in the loop, twisting the sling to the left, A, Fig. 38, and holding the rifle with the right hand as shown in the figure. Twisting the sling to the left causes a flat surface instead of the cutting edge of the sling to rest against the wrist.

2. Extend the arm on through the loop, (Fig. 39), bringing the loop



FIG. 39

well up near the pit of the arm, grasping the piece with the left hand, and pressing down keeper, A.

3. Place left hand between the sling and piece, (Fig. 40),

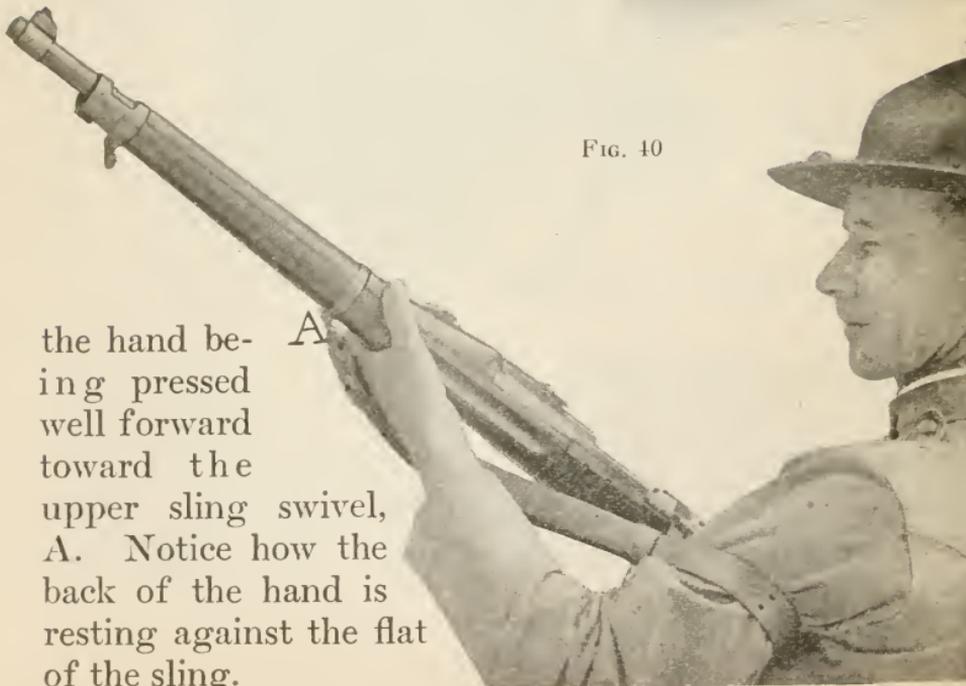


FIG. 40

the hand being pressed well forward toward the upper sling swivel, A. Notice how the back of the hand is resting against the flat of the sling.

4. Come to the position of aim, Fig. 41. Pressure is applied to the sling by pressing forward the left hand, and holding the rifle to the shoulder with the right hand. Remember that whatever pressure

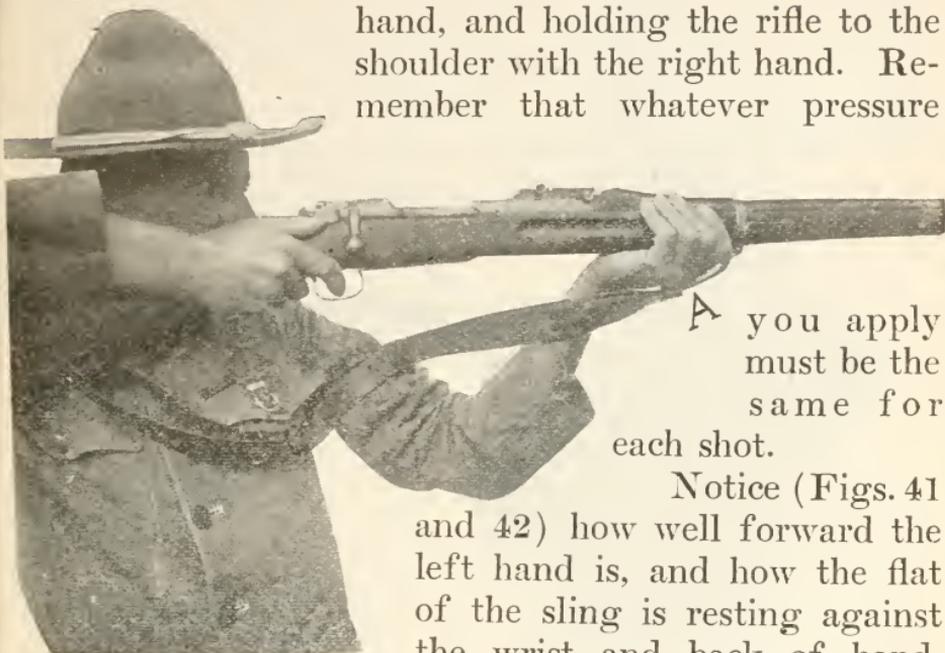
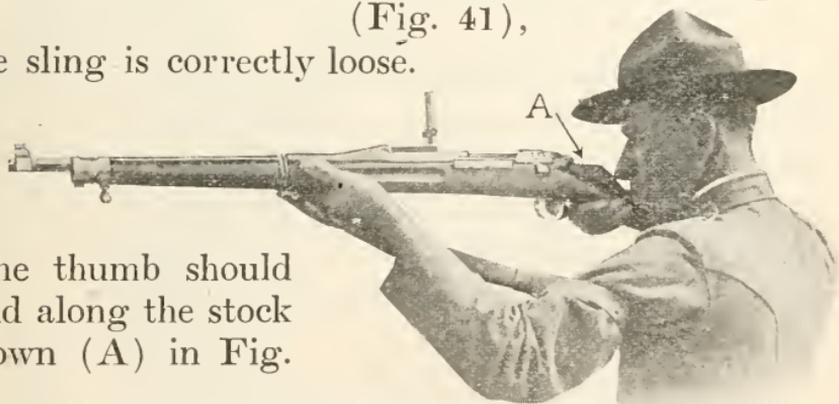


FIG. 41
Right side view

As you apply must be the same for each shot.

Notice (Figs. 41 and 42) how well forward the left hand is, and how the flat of the sling is resting against the wrist and back of hand. See how the short strap, C, (Fig. 41),

of the sling is correctly loose.



The thumb should be held along the stock as shown (A) in Fig. 42.

Holding of piece and position of body. While, because of differences in contour of body, it

FIG. 42
Left side view

is not possible for all men to hold the piece the same way and to assume the same positions of the body, there are certain basic principles in both the holding of the piece and the position of the body that must be observed to get the best results in shooting. For example, among which are: holding the left arm well under the piece in all firing

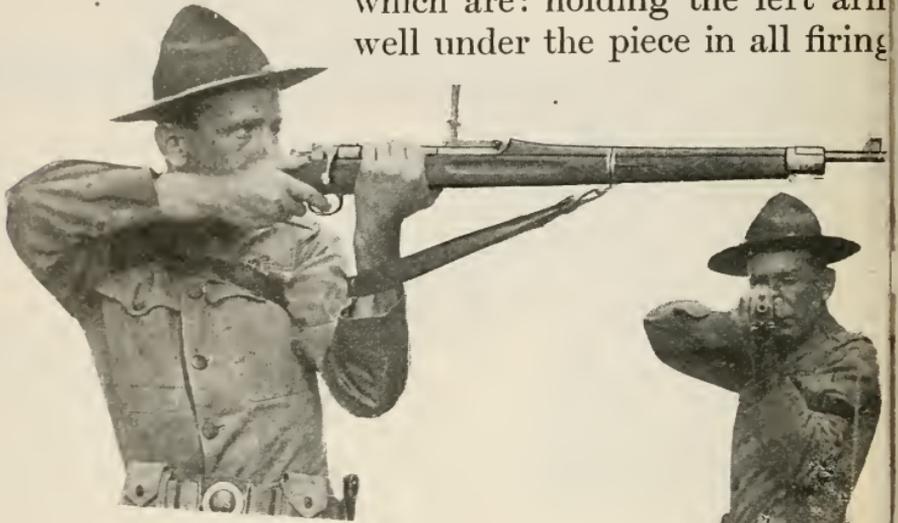
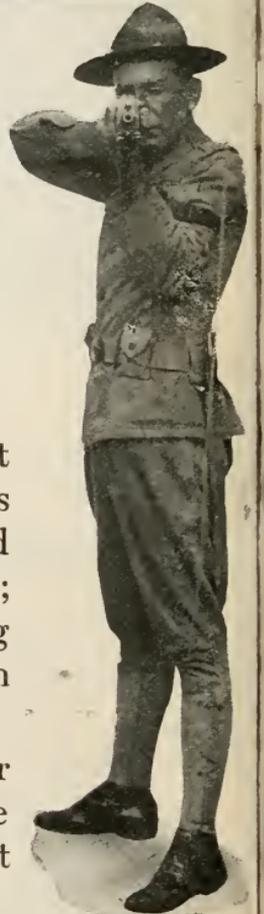
*Side view*

FIG. 43

*Front view*

positions except sitting; holding the left hand as near to the upper sling swivel as possible; placing cheek against stock and eye as close to cocking piece as possible; sling tight; point of elbows in kneeling and sitting positions to be slightly in front of knees.

Without violating any of these or other principles take hold of the piece and assume the position of the body that is most comfortable to you.

Fig. 43 and the following illustrations show various methods of using the sling, holding the piece and taking position.

Study them carefully, and try them out, for they are the ones that are used by our best shots.

Standing position. Fig. 43. Notice position of feet; body well balanced; right elbow raised; left elbow pressed close to body; head inclined well to right; sling passing under left arm



FIG. 44

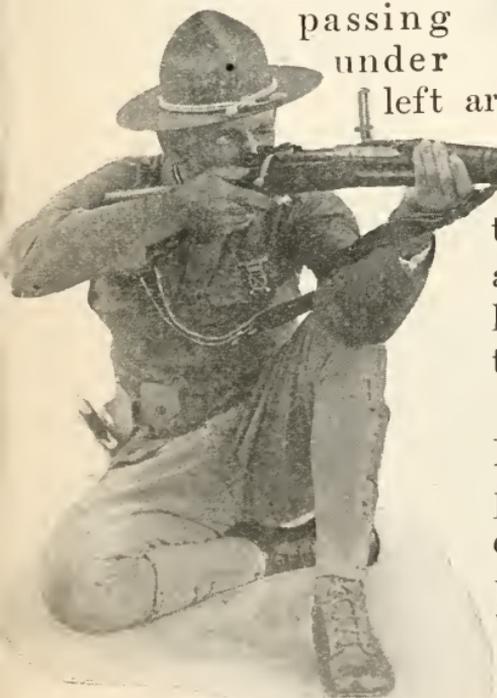


FIG. 45

at arm pit and very tight; tightness of sling pressing against left wrist; body leaning back slightly; right thumb along stock.

Kneeling positions. 1.

Fig. 44. Notice right knee pointing to right flank; left elbow resting on left knee, point of elbow well over knee; right heel supporting body; body bent forward; thumb along stock; cheek

against stock; sling as in Fig. 43.



FIG. 46



FIG. 47

2. Fig. 45. Notice right foot on which soldier is sitting; note position of left elbow; left hand well forward near upper sling swivel; right thumb along stock; body bent forward.

This position is excellent, if your build will enable you to take it.

Sitting positions. 1. Fig. 46. Note how head is bent well forward and right thumb held along stock; left hand well forward; heels dug into ground; body bent well forward; arm through loop of sling; note elbows.

2. Fig. 47. Same as Fig. 46, except position of feet and legs. Study carefully position of head, hands and elbows.

3. Fig. 48. *Rapid fire.* Keep piece at shoulder while ejecting the shells, raising head when bolt is pulled back, and keeping rifle and elbows in place.



FIG. 48

4. Fig. 49. Note general position of body and grip of piece, which show firmness and solidity.



FIG. 49

Study this picture carefully.

(Note incorrect position of thumb of right hand, which should be along stock and not across it.)

Prone positions. 1. Fig. 50. *Placing piece to shoulder.* Left hand well forward, piece resting on flat



FIG. 50

of hand and not on fingers; front of body raised and turned to left; left elbow well under rifle; butt of stock grasped in right hand and placed in hollow of shoulder.

2. Fig. 51. Note excellent position of left hand, and also how left elbow is well under rifle.



Right view



Left view

FIG. 51

Note excellent position of legs.

3. Fig. 52. Note angle of rifle with body,—rifle well inclined to left.



Note also good position of legs and feet.

4. Fig. 53. *Rapid fire.* Keep piece at shoulder while directing the shells in rapid fire.



FIG. 52



FIG. 53

Sandbag rest. In the sandbag rest some men rest the piece directly on the sandbag as shown in Fig. 54.



FIG. 54

Difficulty of this position of piece on sandbag is in getting uniformity. The positions of feet, hands, legs, and head are very good. Study them carefully.

Others rest the piece on the hand, which rests on the sandbag, as in Fig. 55.



FIG. 55

Advantage of this position of piece is that it is suited to giving uniformity of hold. Note incorrect position of left foot, which should be same as right foot

The secret of success in shooting with the sandbag rests is uniform holding,—that is, holding the piece the

same way each time,—and the position with the hand on the bag, as in Fig. 55, is the one best suited to getting this result.

DEFLECTION AND ELEVATION CORRECTION DRILLS (SIGHT-SETTING DRILLS)

Sight Correction. You may find when firing at a target that the first shot has missed the bull's-eye or figure. Now, one of two things may be done in order to cause the second shot to hit the bull's-eye or figure: (1) The point of aim may be changed, or (2) the sights may be moved and the same point as before aimed at.

In order to do accurate shooting it is necessary to have a well-defined mark at which to aim; consequently, except for very slight corrections, the method of moving the sights, involving changes in elevation and windage, is the one to be used.

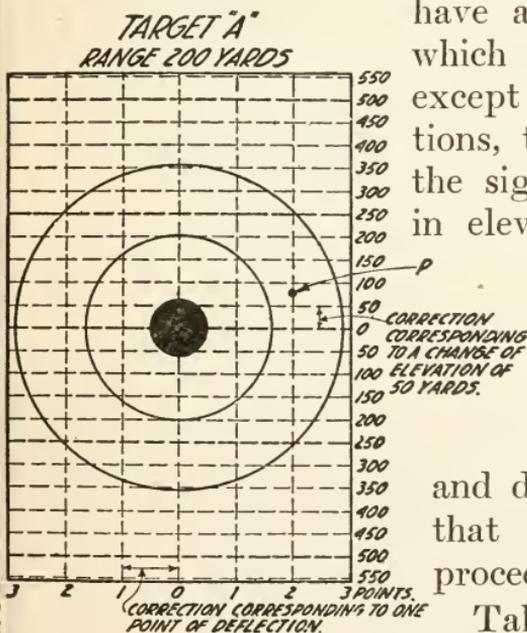


FIG. 56

Exercises. In order to give the soldier practice in making corrections in elevation and deflection (windage),—that is, in sight-setting,—proceed as follows:

Take an "A" target and rule it off with red vertical

lines to represent range and black or blue horizontal lines to represent windage deviations, as in Fig. 56.

Tell the men to set their sights (either peep or open) for 200 yards, no windage. Examine the sights (assisted by the lieutenants, noncommissioned officers and expert riflemen).

Then say, for example, "You have fired a shot at 200 yards with your sights set as you now have them. The shot was marked here (pointing to 'P,' Fig. 56). Change your sights so as to move the next shot into the bull's-eye,—considering that you take the same hold as you did the last time."

(Note. In this case the sight should be

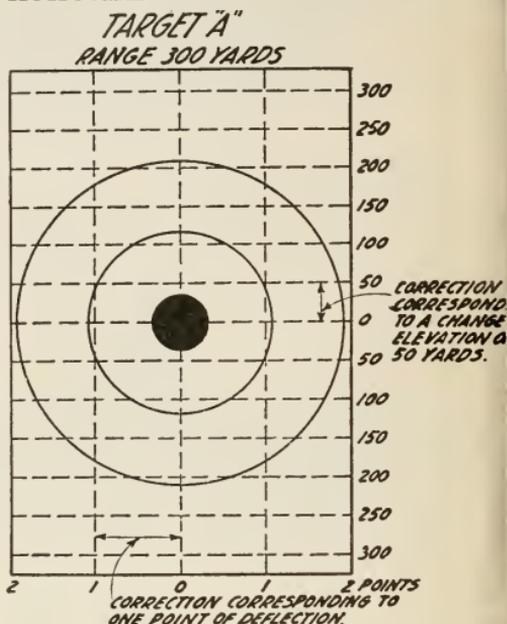


FIG. 57

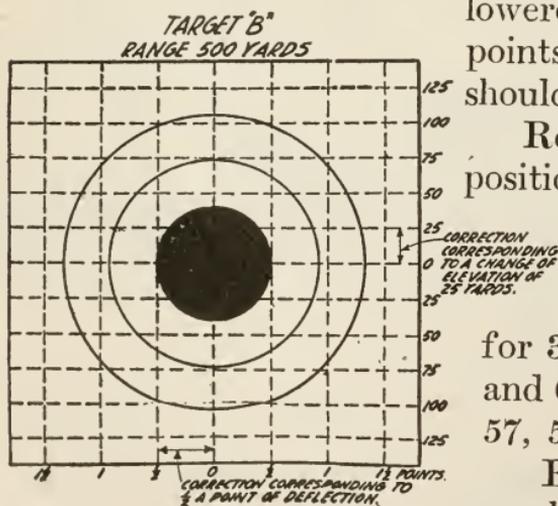


FIG. 58

lowered 75 yards and 2 points of left windage should be taken.)

Repeat with different positions for "P" until the men all understand the method and the reasons. Do same for 300 yards, 500 yards, and 600 yards. See Figs. 57, 58 and 59.

Explain that in firing no change in sights should

be made until the man is sure that his hold was good, and then change without hesitancy.

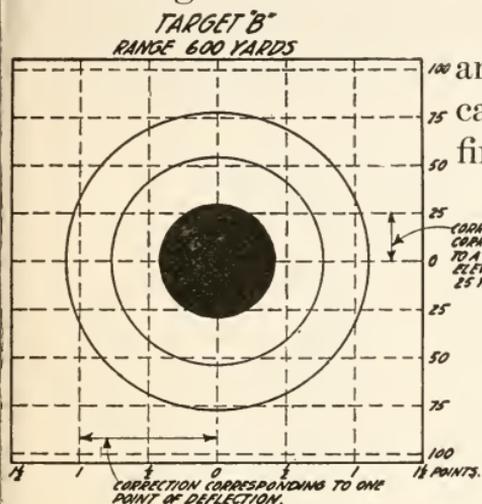


FIG. 59

The correct use of sights and their proper adjustment can thus be taught without firing a shot. This exercise will save much time and work on the range.

Elevation. As previously explained, raising the rear sight increases the range of the bullet and lowering it decreases the range.

The method of setting the rear sight for different distances was explained on page 221.

The amount of change which a given amount of elevation will cause in the point struck varies with the range and with the rifle and with the ammunition used.

For example, generally and approximately, in order, at a range of 500 yards, to change the point struck 1 foot, the rear sight must be changed 48 yards, while to change the point struck 1 foot at 1000 yards it must be changed 12 yards. That is to say, if you fired a shot at 300 yards, and then with the same aim, hold and other conditions as before, you *raised* your rear sight 48 yards, the next shot would strike the target 1 foot *above* the first one, and if you *lowered* the rear sight 48 yards, the bullet would then strike the target 1 foot *below* the first one. If firing at 1000 yards, *raising* the rear sight 12 yards would cause the bullet to strike the target 1 foot

higher and *lowering* the rear sight 12 yards would cause it to strike 1 foot *lower*.

The following table gives the approximate changes in the rear sight to move the point struck 1 foot at ranges from 100 to 1000 yards:

Range	Correction in elevation necessary to change the point struck 1 foot
100	415
200	185
300	105
400	70
500	48
600	35
700	25
800	20
900	15
1,000	12

The score-books issued by the Ordnance Department contain elevation charts and all you have to do is to consult the chart of your score-book in order to get the amount of elevation necessary at any particular range in order to raise or lower your shots any desired distance.

Deflection (windage). Corrections in the deflection (side movement) of the bullet are made by means of the windage screw that moves the movable base, each division of the graduations on the rear end of the movable base being called a "point of windage."

One point of windage moves the point struck 4 inches for each 100 yards of range.

That is to say, at 100 yards, 1 point of windage moves the point struck 4 inches; at 200 yards, 8 inches (2 x 4); at 300 yards, 12 inches (3 x 4), etc.

Consequently, if at 100 yards the wind were carrying your bullets 8 inches to the side, you would take two points of windage to get on the bull's-eye, and if the wind were carrying your bullets 20 inches to the side, you would take 5 points of windage, irrespective of the rate at which the wind was blowing.

Again, if at 200 yards the wind were carrying your bullets 8 inches to the side, you would take 1 point of windage, and if it were carrying your bullets 20 inches to the side, you would take $2\frac{1}{2}$ points, irrespective of the rate at which the wind was blowing.

In using the wind gauge remember *windage is always taken in the direction from which the wind is coming (into the wind) and the bullet moves in the same direction that the rear sight moves,—that is, if the wind is coming from the right, you take right windage and the bullet will strike to the right. Likewise if you move the rear sight to the left (take left windage), the bullet will strike to the left.*

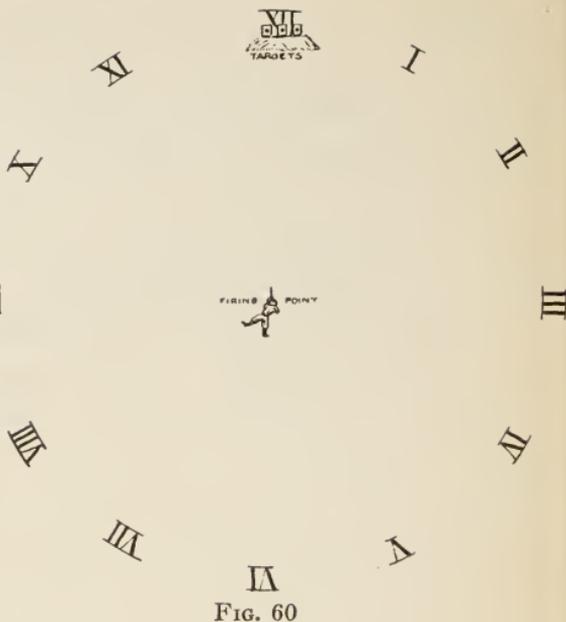
Designation of winds. Winds are designated as "12 o'clock," "1 o'clock," "2 o'clock," etc., winds, depending on the direction *from* which they come.

Imagine the firing point to be in the middle of the face of a clock and the target to be at 12 o'clock; 3 o'clock will be on your right, 9 o'clock on your left, 6 o'clock in your rear and 12 in your front.

A wind blowing *from* your right to your left is called a 3 o'clock wind; one blowing *from* your rear is called a

6 o'clock wind; one from your front, 12 o'clock wind, etc.

The score books issued by the Ordnance Department have windage charts that have been carefully worked out and all you have to do is this: Estimate the force of the wind in miles per hour, and determine the direction from



which it comes (whether a 9 o'clock wind, a 2 o'clock wind, etc.). Then look at the windage chart and see just how much windage you must take.

The simplest and best rule for the beginner is for him to make his estimate and then ask an experienced shot what windage to use, checking this up with what he found on the windage chart. In this way he soon learns to estimate for himself.

Practice estimating the wind. Ask a man who has been making 5's and 4's what windage *he* used and check up with your own estimate.

You can find out the direction of the wind by watching smoke, grass or the limbs of trees.

Throw up some small straws and watch which way they are blown, or wet your finger and hold it up. The wind cools the side it strikes.

A 12 o'clock wind slows up the bullet and a 6 o'clock wind helps it along,—so, in the first case you would need more elevation and in the second less elevation.

Adjusting the sights. Although our rifles are made with the greatest possible care, the graduations on the rear sight will be found correct for but a comparatively few rifles. Some shoot high, others low; some to the right, others to the left, and so on.

Determine what corrections, if any, are necessary for your rifle at the different ranges and record them in your score-book. A rifle that needs no correction is said to "shoot on the mark."

The correction necessary for each particular rifle at any range is found by shooting it a few times at that range, and is constant with the same ammunition and when firing under the same conditions.

The zero of a rifle. As previously explained, the twist of the bullet given by the rifling of the barrel causes the bullet to move to right, which movement, called "the drift," is compensated by having the slot in the rear sight for the drift slide, slope to the left. However, in some rifles the compensation is too great and in others it is not enough.

That reading of the wind gauge necessary to overcome the drift of a rifle at a particular range is called the "zero" of that rifle for that range, and all allowances for wind should be calculated from this reading.

The "zero" of a rifle is found by shooting it on a perfectly calm day.

Front sight cover. There is no uniformity of practice in the service regarding the use of the front sight cover in firing,—some use it, while others do not.

The use of the front sight cover possesses no disadvantages, while it does prevent the black from being rubbed off and also lessens the effect of light changes. Because of this and also because the front sight cover would be used habitually in battle, its use is recommended in all firing.

Gallery practice. After the soldier has been thoroughly instructed in sighting, and in the position, aiming, deflection, and elevation correction drills, he is exercised in firing at short ranges (50 and 75 yards) with the gallery practice rifle (.22 caliber).

Notwithstanding the value of the position and aiming drills, it is impossible to keep up the soldier's interest if these exercises are unduly prolonged. By gallery practice, however, the interest is easily maintained and further progress, especially in teaching the trigger squeeze, is made. Many of the external influences, which on the range affect the firing, being absent, the soldier is not puzzled by results for which, at this stage of his education, he could not account were he advanced to firing with full charges. Furthermore, as there is no recoil to induce nervousness or flinching, the soldier soon finds that he can make good scores, and this success is the surest stimulus to interest.

Not only to the beginner is gallery practice of value; to the good shot it is a means of keeping, to a certain extent, in practice, and practice in shooting, as much as in anything else, is essential. Since it can be carried on throughout the year, gallery practice is of much value in fixing in the men the *habit of aimed fire*, than which nothing in his training is of more importance.

Procedure in rapid fire. The soldier should be thoroughly drilled in the mechanism of rapid fire, and instructed in the procedure to be followed on the range and in the regulations governing same, which are as follows:

At 200 yards there will be but one man firing at each target. The officer in charge of the line will command "Load." The magazine will be filled, the piece loaded with one cartridge therefrom, and the safety lock turned to "Safe." When all is ready in the pit the targets to be fired upon will be drawn fully down (the rear targets being blank or targets of another class than those being fired upon), and a red flag hoisted at the center target. When the red flag is displayed, the officer in charge of the firing line will command "Ready," when the safety lock will be turned to the ready and the position of "Ready" standing assumed, with the sling, if used, on the arm. The officer in charge of the firing line will then call so that all may hear, "Ready on the right; ready on the left." When the officer in charge calls out "Ready on the right," etc., anyone who is not ready must call out, "Not ready on target —." If any soldier fails to so call, it will be assumed that he is ready, and if he fails to fire when the target appears he will be given a total miss for that score.

The firing line being ready, the pit is signaled or telephoned, "Ready on the firing line." When this signal is received in the pit, the red flag is waved and lowered and five seconds thereafter the targets appear, remaining in sight one minute and then disappear. The soldier, without coming to the "Order," takes the kneeling or sitting position as soon as any part of the target

appears, begins to fire and attempts to fire 10 shots, reloading with a full clip which is taken from the belt, and continues to fire until 10 shots are fired or until the target disappears.

Each unfired cartridge counts a miss.

In case of a defective cartridge or a disabled piece, or when more than 10 hits are made on a target, the practice is repeated.

At 300 yards the procedure is the same, except that the soldier assumes the prone position as soon as any part of the target appears, the time limit being 1 minute and 10 seconds.

At 500 yards the procedure is the same, except that the soldier is in the prone position, with the piece at the shoulder, before the target appears, the time limit being 1 minute and 20 seconds.

At all ranges, in rapid fire, firing is from a full clip, and the second clip must be loaded from the belt. In case a clip jams or breaks, cartridges may be loaded singly.

At the expiration of the time limit, the target is pulled down and marked, all hits being given their proper value. In case of more than 10 hits on a target, the target will not be marked but the firing line will be notified and the firing on that target repeated. In case a soldier fires on the wrong target, only such shots as he may have fired on his own target will be counted on his score. He will be given misses for the remainder of his score.

In firing rapid fire, if more than one target is used, the order of men at the firing point will fire together,

one man at each target, all targets being fired upon at one time.

The battle sight is used at all ranges in rapid fire.

Estimating distance. Ability to estimate distances correctly is an important part of a soldier's education.

While it is true that fire on the battlefield will usually be by groups and the ranges will be given by officers, the battlefield is reached only after a long series of experiences in scouting, patrolling, and outpost duty, in which the soldier is frequently placed in positions where it is necessary that he shall determine for himself the range to be used in order that his fire may be effective.

There are different methods of estimating the range (for example, by sound, trial shots, range-finding instruments, etc.), but the only ones that the average soldier need know are those of estimating distance by the eye and by trial shots.

To estimate distance by the eye with accuracy, it is necessary to be familiar with the appearance, as to length, of a unit of measure which can be compared mentally with the distance which is to be estimated. The most convenient unit of length is 100 yards. To impress upon the soldier the extent of a stretch of 100 yards two posts 100 yards apart, with short stakes between to mark each 25 yards, should be placed near the barracks, or on the drill ground, and the soldier required to pace off the marked distance several times, counting his steps. He will thus learn how many of his steps make 100 yards and will become familiar with the appearance of the whole distance and of its fractional parts.

Next a distance of more than 100 yards will be shown him and he will be required to compare this dis-

tance with the 100-yard unit and to estimate it. Having made his estimate, he will be required to verify its accuracy by pacing the distance.

A few minutes each day should be spent in this practice, the soldier often being required to make his estimate by raising his rear-sight leaf and showing it to the instructor. After the first drills the soldier should be required to pace the distance only when the estimate is unusually inaccurate.

The soldier should be taught that, in judging the distance from the enemy, his estimate may be corrected by a careful observation of the clearness with which details of dress, the movements of limbs or of the files in a line may be seen. In order to derive the benefit of this method, the soldier will be required to observe closely all the details noted above in single men or squads of men posted at varying distances, which will be measured and announced.

Although the standing and kneeling silhouettes used in field practice afford good objects upon which to estimate distances, the instructor should make frequent use of living figures and natural objects, as this is the class of targets from which the soldier will be compelled to estimate his range in active service.

Methods of estimating long distances by the eye.
The following methods are found useful:

(a) The soldier may decide that the object cannot be more than a certain distance away nor less than a certain distance; his estimates must be kept within the closest possible limits and the mean of the two taken as the range.

(b) The soldier selects a point which he considers the middle point of the whole distance, estimates this half distance and doubles it, or he similarly divides the distance into a certain number of lengths which are familiar to him.

(c) The soldier estimates the distance along a parallel line, as a road on one side, having on it well-defined objects.

(d) The soldier takes the mean of several estimates made by different persons. This method is not applicable to instruction.

Appearance of objects: How modified by varying conditions of light; difference of level, etc. During instruction the men should be taught the effect of varying conditions of light and terrain upon the apparent distance of an object.

Objects seem nearer—

(a) When the object is in a bright light.

(b) When the color of the object contrasts sharply with the color of the background.

(c) When looking over water, snow, or a uniform surface like a wheat field.

(d) When looking from a height downward.

(e) In the clear atmosphere of high altitudes.

Objects seem more distant—

(a) When looking over a depression in the ground.

(b) When there is a poor light or a fog.

(c) When only a small part of the object can be seen.

(d) When looking from low ground upward toward higher ground.

The recoil. The recoil, or the "kick," of the rifle is due to the explosion of the powder. The powder is changed into a gas and this gas needs more room than the cartridge gives it. Something must give way.

The pressure of the powder is equal in every direction. The walls of the chamber prevent motion sideways,—so that all motion is in the direction of the length of the barrel. The force used in sending the bullet forward is exactly the same as that which sends the rifle backwards. The rifle is much heavier than the bullet,—about 425 times as heavy—and moves correspondingly slower. If they were of equal weight, they would move with the same speed.

The rifle, if held loosely, will move against the shoulder quickly and will give a hard blow. If it is pressed firmly against the shoulder it can't get a start and the recoil becomes a push instead of a kick. Therefore, to avoid injury, *hold the piece pressed firmly against the shoulder*, and wear a pad on the shoulder and on the elbow.

Flinching. Don't flinch. Don't be afraid of your rifle. Flinching is due to fear. Don't be a coward.

Keep your eye open when firing. This will do more than anything else to prevent flinching. Also, wear a pad on your shoulder and on each elbow; press the butt hard against your shoulder and you cannot be hurt.

Practice "calling your shots,"—that is, announcing where your rifle was aimed at the moment of discharge. You will have to keep your eye open to do this, and it will thereby help you to overcome flinching.

A flincher must cure himself. Try squeezing the trigger very slowly and letting the rifle go off without knowing just when it does. If all else fails, try placing your thumb back of trigger and discharging piece by pinching slowly.

Padding. Pad the right shoulder and both elbows of your shirt, with what the tailors call "wadding." Get the padding well up on the shoulder and well out on the arm. Take the prone position and see just exactly where padding is needed.

Have this done before firing your first shot. Padding often saves the beginner from flinching.

Calling your shots. Get in the habit of calling your shots,—that is, announcing where your rifle was aimed at the instant it was discharged. If the instructor is present, call your shots so that he can hear you; otherwise call them to yourself either in a low tone or mentally.

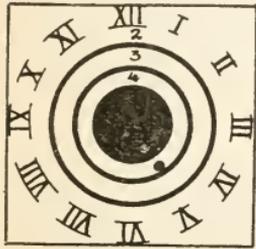


FIG. 61

Shots are described and called as follows:

Imagine the target to be the face of a clock. If your rifle were aimed at the point ● where you fired, you would call, "4 at 5 o'clock" ("4" meaning the value of the hit, and "5 o'clock" indicating its position), or you would say, "A 4, low and to the right," but the clock system is the better.

The coach,—the officer or noncommissioned officer who advises you and who corrects your errors,—wants to hear you call your shots. If, for example, you call a 4 at 6 o'clock and you get a 2 at 9 o'clock, assuming you

are calling correctly, he knows that either your sights are improperly set, you are committing some error, or your rifle is a poor one. He lets you shoot again; you call 3 at 3 o'clock, but get a 2 at 8 o'clock. He sees that something is radically wrong, so he tries your rifle. Generally the rifle is not at fault; so the coach begins to study the case with the view of discovering the trouble. He has been looking at you—

1. To see if you have a good position and to see if the butt is properly placed against the shoulder.

2. To observe how your body moves after the rifle is fired.

3. To see if you strike yourself on the nose with your thumb or strike your cheek with your finger nails, or bruise the third joint of your middle finger against the trigger guard.

4. To see if the piece is canted.

5. To observe if you are breathing properly,—that is, holding your breath when you squeeze the trigger.

6. To see if you flinch.

Scorebook. Use your scorebook and study it carefully. The Bull's-eye Scorebook and the Marine Scorebook are both excellent. Some riflemen prefer one while others prefer the other. Follow the instructions of the scorebook issued you and you will qualify as marksman or better.

While waiting to take your position on the firing line, enter in your scorebook, the date, hour, place, wind, light, etc., just as explained in the scorebook. Be sure to do this; then when you come to fire at the same range with the same rifle on another day, and conditions are the same, you can start right in making 5's and 4's in-

stead of 2's and 0's. In other words, you will not have to feel around for the bull's-eye. You will know, for instance, how much windage you had the last time and what was the velocity of the wind. If the wind is not so strong this time, you will take less windage, and so on. In this way you will save time and loss of points in searching for the correct sight-setting.

Effect of heat and cold. Heat causes shots to strike high, and cold causes them to strike low.

Therefore, if you shot on a warm day and made 5's, and recorded temperature and other conditions in your scorebook, you would know on looking at your score sheets that you should raise your elevation, if you were firing on a cold day.

Effect of moisture. Dampness causes shots to strike high and dryness causes them to strike low. Therefore, on damp days take lower elevations than on dry days.

Effect of light. Light affects the aiming without the beginner knowing it. It does not, however, affect the travel of the bullet.

A dark target causes a tendency to aim farther below the bull's-eye than if the target were bright. Therefore, use higher elevations with dark targets. As it gets darker, higher elevations should be used.

If you *always aim carefully and correctly* the light will have little effect on your aiming,—that is, if your eyesight is good.

If you are shooting in a dull light and a bright sun comes out, say on your right, there is a tendency to move the front sight to the opposite (left) side of the rear sight notch, since the near (right) edge is shaded and obscured

somewhat. Therefore $\frac{1}{4}$ to $\frac{1}{2}$ windage into the sun (right in this case) should be taken to overcome this.

In using battle sight, hold higher for a bright light.

We also raise our sights if a strong sun comes out. Therefore, we have this rule: *Move your rear sight into the sun, just as you do for a wind,—and raise your elevation.*

Mirage gives a wavering appearance to the target. It is heated air that is moving. It is sometimes called "heat waves."

With the wind between 2 and 14 miles an hour on clear, hot days the waves can be seen moving across the target.

When there is no wind or a light six o'clock wind, the waves go straight up, or "boil." *Never fire when the mirage is boiling,—wait for it to move from one side to the other and then take windage to correct for it.*

Summary of temperature, light and moisture effects:

<i>Raise elevation for—</i>	<i>Lower elevation for—</i>
Dull target	Bright target
Shooting in the sun	Target in sun
Hot gun	Cold gun
Dirty gun	Clean gun
Cold day	Hot day
Bright or shining sight	Moist day
Cloudy day	Full sights
12 o'clock wind	6 o'clock wind

Firing with bayonet fixed. In firing with bayonet fixed usually a lower point on the target will be struck, corresponding to a reduction of about 50 yards in the range.

Finding the target. If you make a miss and you do not know where the bullet went, although you are sure you aimed correctly and your hold was good, you should—

1. See if you have set your windage into the wind. Sometimes men take left windage when they should have right.

2. See if your sights are at the proper elevation.

3. See whether the set screw which clamps the slide has loosened up and the slide slipped down or up.

4. Be sure that you used the correct notch.

5. Lower your elevation 50 yards if you are firing at 800 and 1000 yards. If at 500 or 600 lower 100 yards. Fire again and repeat with another reduction of range. If this does not find the target, add to the original elevation. If your sights are otherwise correctly set, you should find the target before a fourth shot is necessary.

Coaching. While any amount of coaching is permitted in the instruction practice, coaching of any nature whatsoever is strictly prohibited in record practice.

In record practice, after a soldier has taken his place at the firing point no one must attempt to render him any assistance whatever. (Par. 96, S. A. F. M.) He is not to talk to anyone about anything. (Author)

Firing in pairs. It is customary for two men to fire alternately at each firing point.

Use of rests. In known distance practice no rest except the authorized sandbag at 600 yards slow fire may be used.

However, in combat firing such rests as are available will be permitted.

Dress and equipment. In all classes of firing the service uniform will be worn. The coat may be omitted when authorized by the post commander.

In all known distance practice the soldier will be equipped with rifle, cartridge belt, and cartridge belt suspenders. When firing the cartridge belt suspender may be slipped from one shoulder if desired. (Par. 94, S. A. F. M.)

THE TARGET RANGE

Noncommissioned officer in charge of pit. A noncommissioned officer detailed to look after the arrangements at the butts.

The parapet. The mound of earth which protects the markers who are in the pit pasting the shot holes and indicating the value.

The pit. The space in which the targets are placed. It is a ditch 10 feet deep and 10 to 12 feet wide, of various lengths, depending upon the number of targets.

The butts. The pit, parapet and backstop, which is behind the targets, are called "The Butts."

The firing point. The line or spot on which the man is placed when firing.

The range house. A house built behind or near the butts, and in which target material is kept, targets are put together, pasted, etc.

The range officer. The officer charged with the management of the range.

Disks. The value of the shots are indicated from the pit with different colored disks that are fixed on the end of long handles.



FIG. 65

A white disk indicates a bull's-eye (5).

A red disk indicates a center (4).

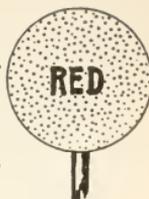


FIG. 66



FIG. 67

A black and white disk indicates an inner (3).

A black disk indicates an outer (2).



FIG. 68

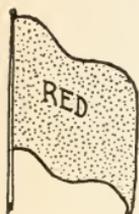


FIG. 69

A red flag indicates a miss.

A red and white flag indicates a ricochet (rick-o-shay), and means that the bullet struck the parapet and then glanced off and struck the target. The ricochet flag is shown with



FIG. 70

a disk of the value of the hit.

In practice, in the absence of the prescribed ricochet flag with white field and red center, a white and red flag are displayed.

A ricochet counts just as much as a clean hit.

A shot which cuts the edge of the bull's-eye is a 5; a shot which cuts any ring has the value of the space inside the ring.

Spotters. Spotters are small disks of tin or cardboard that are fastened on a peg which is put into the shot hole to indicate its position to those at the firing point. With a pair of field glasses they can be seen distinctly from the firing point and thus the exact loca-

tion of the hit known. White spotters are used for 5's and black spotters for all other hits.

Targets. There are four targets used, and they are designated as "A," "B," "C," and "D" targets.

Target A is used for 200 and 300 yards, slow fire.

Target B is used for 500 and 600 yards, slow fire.

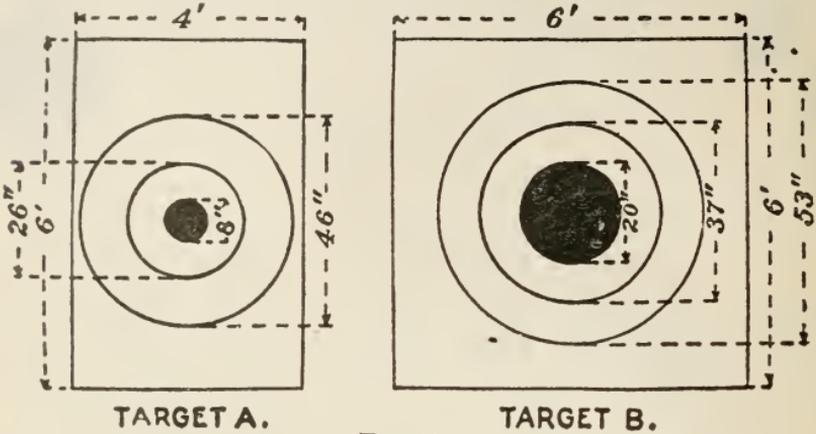


FIG. 62

Target C is used for 800 and 1000 yards, slow fire.

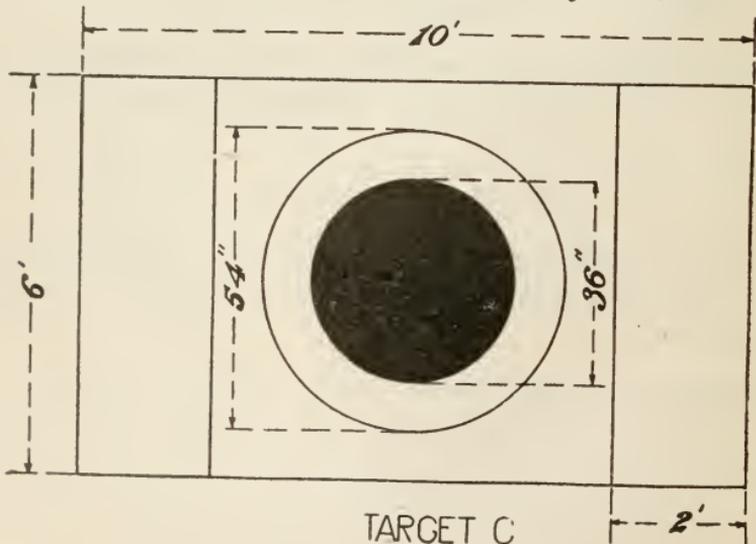
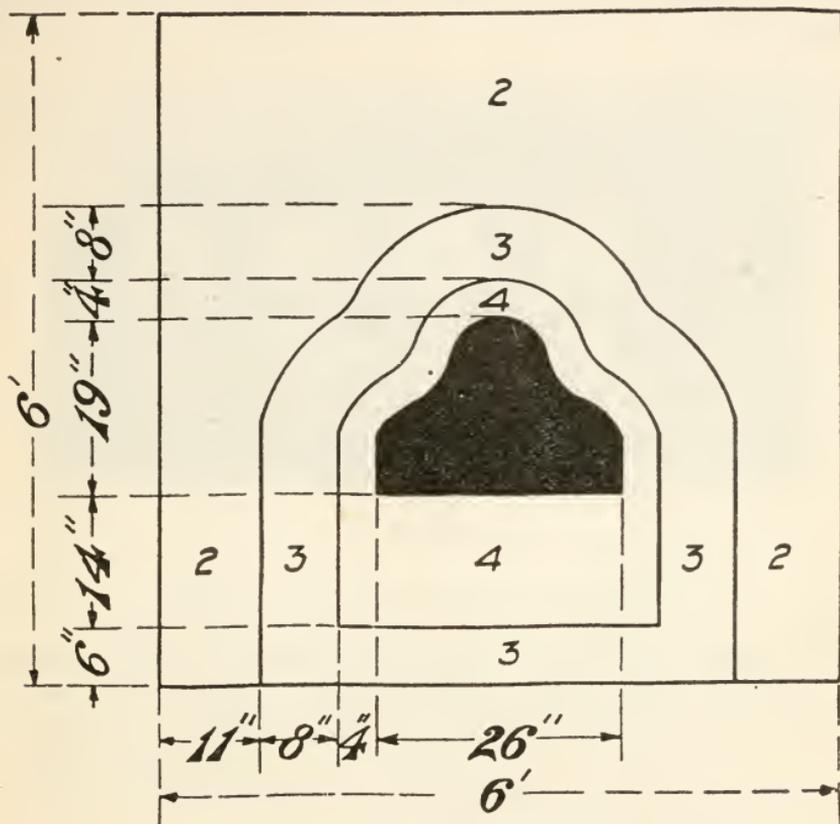


FIG. 63

Target D is used for 200, 300 and 500 yards, rapid fire.



TARGET D

FIG. 64

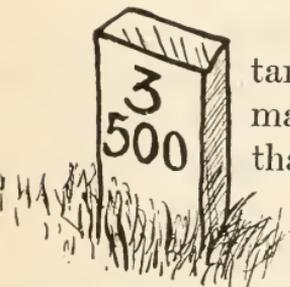


FIG. 71

Firing points. On well conducted target ranges the firing points are marked by stakes, Fig. 71, which means that this stake marks the firing point for the No. 3 target and the range is 500 yards,—that is, the target is 500 yards away from this stake.

Each target is numbered; the number being down low on the parapet or up on the backstop, above the top of the target.

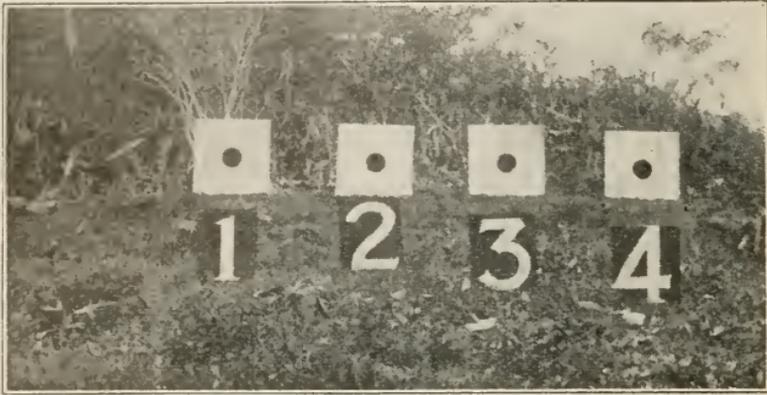


FIG. 72

Each man should be sure to fire on his own target. A bull's-eye on the wrong target gets a zero on your score sheet. One shot wasted in this way may mean the loss of expert qualification,—or two dollars a month for the term of your enlistment,—an expensive piece of carelessness.

Before you fire *glance up and see that you are on your own target.*

Marking. One of the important duties on the target range is that of *marking*. The First Sergeant details a certain number of men for "pit" detail,—usually two per target. These men are marched to the pit to be there about 20 minutes before firing is to commence.

They assist the noncommissioned officer in charge of the pit by getting the targets ready and in other ways.

Before firing starts the markers go to the targets to which they are assigned and when the firing begins they watch for the hole made by the bullet.

A little practice enables a man to tell whether his target was fired on, since the "crack" of the bullet going over your head sounds differently from the "crack" of the one passing to one side.

Just as soon as you know your target was fired on, either by sound or seeing the hole, pull it down and mark the raised target **ACCURATELY**. Place the center of the disk over the shot hole, and hold it there for a moment; then lower it.

Don't indicate where a miss went unless you are **ABSOLUTELY POSITIVE** about it. If you have to guess it, don't do it,—let the firer guess,—he will know he is guessing, but he does not think you are and he will go by what you mark. Suppose you are wrong,—and half the time you are, when guessing,—imagine the effect it will have on the firer. He will keep getting further away from the target.

The golden rule of the target range is: *Mark for others as you would have others mark for you.*

Be honest, careful and quick about your marking and your marking will be good.

Don't mark a miss until you have gone over the target carefully. Look in the rings and in the numbers indicating the value of hits. Examine edges of the frame carefully. Then if you are sure, wave the red flag.

Danger signals. When the target is in place and not in use, *always* display the red signal flag in front of

it, and be sure to place the flag so that it will be well above the parapet.

Half-masting the targets. If during the firing word is received that firing on such and such a target has ceased, the target in question is at once "half-masted,"—that is, brought about half-way down,—and the red flag displayed in front of it.

POINTS TO BE REMEMBERED

Before Firing

1. Blacken the front and rear sights. Smoke from a small piece of burning camphor gives the best results. Be sure to clean off all oil from the sights before blackening them, thereby insuring a uniform, velvety, dry black.

2. Clean the bore with dry rags and then with a rag saturated with gasoline, so as to remove all oil, which is liable to make your shots go wild.

3. See that there is no oil in the well of the bolt, as some of it may fly into your eye when the piece is discharged.

4. Having blackened your sight and cleaned your rifle, you should, while waiting for your name to be called, spend your time in position and aiming exercises, aiming at the target or other objects on or near the range. This practice previous to firing will prevent nervousness and will have a marked effect on your score. Also, study the wind, estimating its direction and velocity. Check up your conclusions by asking the more experienced shots in the company.

5. Watch the expert shots while they are on the firing line, and see what they are doing. Get all the

“dope” you can from them regarding windage, etc., before you take your place on the firing line.

6. When your name is called to replace a man on the firing line, get your score card at once from the First Sergeant and give it to the scorer of the target to which the First Sergeant has assigned you. Get your rifle and ammunition, examine your sights to see if they are still black and adjust them. Adjust your sling, get out your scorebook and pencil, and go up near your firing point. Enter in your scorebook the date, hour, wind, light, etc.

7. When the man you are to relieve leaves the firing point, take your place promptly. *Then load. Do not under any circumstances load before you are on the firing line.*

8. Don't waste your time while on the range. Keep your eyes open and learn. Know what you are to do, and do it. Don't make it necessary for your Company Commander, the First Sergeant, or someone else to get after you.

POINTS TO BE REMEMBERED

While Firing

1. Don't breathe while aiming. Take a deep breath; let some of it out, and then hold the remainder until after you have fired.

2. Get your sights aligned, and gradually *squeeze* your trigger. Keep your eye open when you discharge the piece. Continue your aim for a moment after discharge. This will enable you to call your shot. Call each shot.

3. Record each shot in your score book, and likewise record light, wind, time, etc., and follow directions therein.

4. Don't flinch. Wear pads and you won't be bruised by the kick.

5. Don't cant your piece. A little cant will throw you well out of the 4 ring.

6. Place the butt of your rifle in the hollow of your shoulder,—not on your arm. Hold tight, for if the piece is held loosely there will be a hard kick.

7. Place your right thumb *along* the stock and press your cheek against the stock.

8. Don't aim too long,—get your sights aligned quickly.

9. Except when your sight is being marked, don't look at the target between shots. Rest your eyes.

10. Don't rub your eyes. It will irritate them.

11. Immediately upon firing pull back the bolt to allow barrel to cool. Don't reload until the man shooting with you has fired. Then do so and aim, fire and eject empty shell.

12. Frequently examine your rear sight to see whether the slide has been jarred loose by the explosion and has slipped down.

13. Be sure you are using the right notch, and also be sure you are firing on the right target. A "5" on another target counts "0" for you.

14. In case of misfire do not draw back the bolt immediately, as it may be a case of hang-fire and an explosion may result which may cause serious injury. In such case cock the piece by drawing back the cocking piece with the hand.

15. Do not leave your cartridges exposed to a hot sun. Keep them in your belt, which will also keep them clean. Cartridges that have been lying in a hot sun will fire high. This also applies to cartridges placed and kept in the chamber of a hot rifle a considerable time before firing. Never place the cartridge in the rifle until you are ready to fire it.

POINTS TO BE REMEMBERED

At All Times

1. Never let the firing pin down by hand on a cartridge in the chamber. If necessary to carry the piece cocked, with a cartridge in the chamber, turn the safety lock to the *right* as far as it will go, so that the word "*Safe*" is seen.

2. In manipulating the bolt always draw it back as far as it will go, thus making sure that the empty shell will be ejected and that when the bolt is shoved forward it will catch the top cartridge in the magazine.

3. Be sure always to have some oil in your oiler, and that the thong and brush when not in use are always in the oiler and thong case.

4. Keep the cover on the front sight habitually.

5. Never load your piece or carry cartridges in the magazine unless specifically ordered to do so.

6. Keep the cut-off turned "*Off*," except when actually using the magazine.

7. Carry your piece habitually with the safety lock at "*Safe*,"—that is to say, locked.

8. Use the sling in all shooting. It will improve your shooting.

9. Never put the muzzle of your piece on the ground. If you do, you will probably get dirt in it, and

if you should fire the rifle with dirt in the muzzle, the barrel will probably be seriously injured. Even if you don't fire the piece, in removing the dirt from the muzzle you may injure the muzzle and thus reduce the accuracy of the rifle.

10. Remember that to shoot well a man must be in good physical condition.

IN CONCLUSION

Practice, practice, PRACTICE. There is no royal road to good marksmanship,—it requires lots of constant, careful, hard and patient practice. This is the only way that the eye, the muscles of the body and the nervous system can be kept in that condition which is necessary for them to be in order to work in unison with one another and with the mind, a requisite without which good marksmanship is impossible.

It is said that the great pianist, Paderewski, practices on a dumb piano for hours every day in order to keep his fingers in perfect condition. So, too, it is necessary for the rifleman to train his muscles and keep them in proper condition.

If properly trained the muscles will not by an improper or convulsive movement pull the rifle off the target when the piece is fired. The muscles must be trained to hold the rifle steady.

The hand must be taught to **SQUEEZE** the trigger so that the aim will not be disturbed and the final pressure will be applied at the exact moment when the top of the front sight is seen to be properly directed on the target.

The eye must be trained to take the same amount of front sight each time and to be focused on the target when the piece is discharged.

But these things require *practice*, practice, **PRAC-TICE**.

So, take advantage of every opportunity to practice aiming and **SQUEEZING** the trigger. It is a common thing at competitions to see expert shots standing, kneeling, sitting, or lying on the ground practicing by the hour **SQUEEZING** the trigger and holding the rifle steady. They place a black disk on a wall 20 or 30 feet away and try to hold the rifle on it.

If expert shots find it necessary to do this, just think how much more necessary it is for beginners. Remember that they were beginners once. If you practice faithfully as they did, there is no reason why you cannot attend competitions and win medals, too.

Use some of your spare moments in practicing the position and aiming exercises.

Put a black paster up on the wall of your squad room and every day practice an hour or more holding on it,—that is, aiming at it and **SQUEEZING** the trigger. When standing around on the company parade, waiting for the company to fall in, practice some more. When on the target range waiting for your turn to shoot, get off to one side and practice holding on a target.

This practice, in addition to training the muscles and educating the eye, will also overcome nervousness.

Remember, in your practice *always to aim at some particular object*.

The Hollifield Target Practice Rod. The best instruction practice that can possibly be had in aiming and in squeezing the trigger is to be obtained with the Hollifield Target Practice Rod, a device which the author, as the result of experience, cannot recommend

too highly. The following illustration shows the rod in use:



FIG. 73

It is really astonishing what results can be obtained from a persevering and painstaking use of the Hollifield rod, which possesses a certain "human interest" that dispels entirely the monotony and irksomeness of aimless snapping. The instructions for the use of the rod describe a simple and effective method of using the device also for elementary practice and instruction in windage and elevation.

The latest Hollifield rod is equipped with an excellent dummy cartridge feature, which enables practice in the mechanism of rapid fire, and instruction should be had with it in rapid fire as well as in slow fire. Men should be required to call their shots.

The Hollifield Target Practice Rod has been officially adopted by the United States Army and can be obtained upon requisition just like any other article of ordnance property. The National Guard of States can get it under Section 1661 R. S., or Section 17 of the Amended Militia Laws. Individuals can, of course, purchase it direct from the Hollifield Target Practice Co., Middletown, N. Y.

CHAPTER II

CARE AND PRESERVATION OF THE RIFLE
RIFLE .

Importance. The care of his rifle should be the soldier's first thought; for, if he would have it take care of him in time of danger, he must take care of it at all times.

It is a generally recognized fact that more rifles become inaccurate and unserviceable by the lack of care than by firing.

The instructions for taking care of the rifle are few and simple. Learn them well and *apply them constantly*,—it only requires a little care and patience. You will be well repaid for it. It may some day save your life.

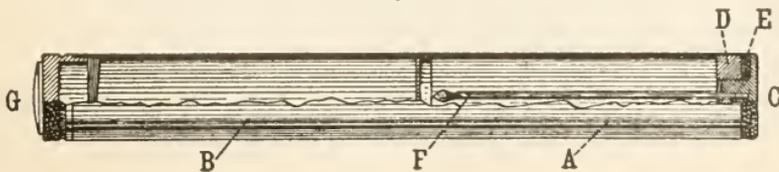
IMPLEMENTS AND MATERIALS FOR CLEANING

The following are the implements and materials used in cleaning the rifle:

Implements

The Oiler and Thong Case, Fig. 1, is carried in the butt of the stock. It consists of a metal tube about six inches long, divided by a partition into two sections;

FIG. 1



Oiler, A, in which a small supply of sperm or "3-in-1" oil is carried; and *Thong Case*, B, in which the thong and brush are carried.

The *Oiler* is fitted with a wire, F, which reaches to the bottom of the *oiler*, and is used for applying oil, a drop or more at the time.

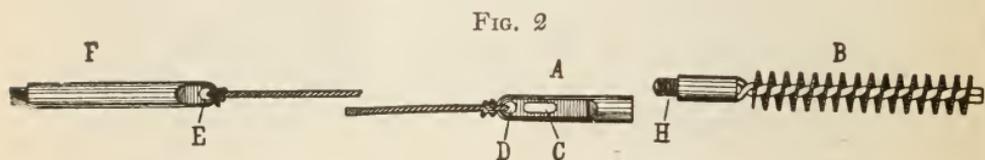
The oil is only for the lubrication of the working parts.

There is a leather pad on the outer end of the *Thong Case*, G, which prevents the noise that would result from the oiler striking the butt plate.

The *Oiler* and *Thong Case* should always be inserted in the stock so that the leather pad will be next to the butt plate.

The soldier should see that there is always a good supply of oil in the oiler.

The *Thong and Brush*, used in cleaning the bore of the rifle, are shown in this figure.



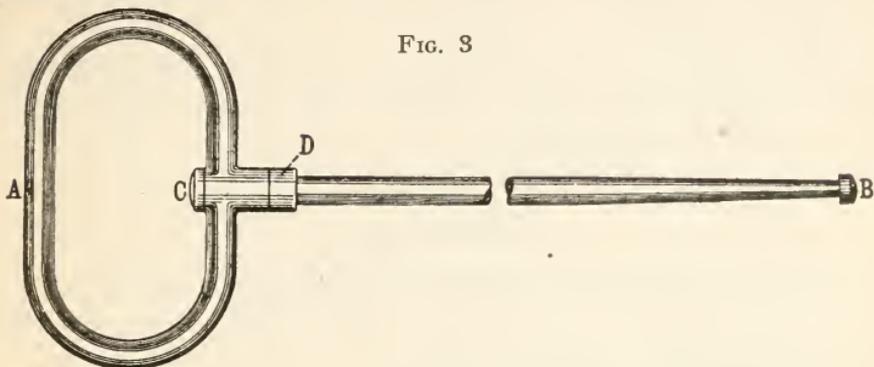
The *thong tip*, A, into which the *brush*, B, is screwed, is provided with a *rag slot*, C; one end of the thong or string, is fastened to the *tip* at D, and other end is fastened the *weight*, F, at E.

In cleaning the bore by means of the thong, the brush or rag should always be drawn from the muzzle toward the breech.

The thong and brush are used in the field, where it is not practicable to carry the cleaning rod.

The Cleaning Rod, Fig. 3, is of sufficient length to extend through the barrel.

FIG. 3

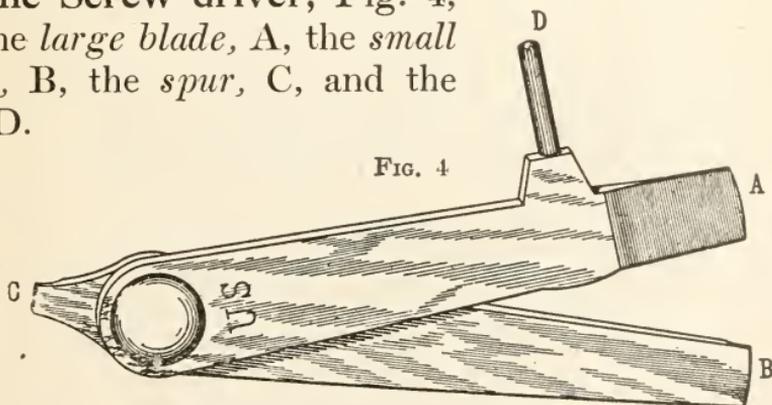


Always insert the cleaning rod into the bore from the breech, and never from the muzzle, which it may injure if inserted from that end. The bolt must, of course, always be removed before the rod is inserted.

The cleaning rod is used in garrison and on the target range. It is easier to manipulate than the thong and brush, cleans the rifle better and is less liable to injure the bore.

The Screw driver, Fig. 4, has the large blade, A, the small blade, B, the spur, C, and the pin, D.

FIG. 4



The large blade should be used for the large butt plate screw, the butt plate cap screw, and the guard screws.

The *small blade* should be used on all other screws, except the cut-off spindle screw, for which the spur should be used.

The *pin* serves as a drift in removing the butt plate cap, ejector, floor plate catch, sear joint and trigger pins, and the band spring.

Materials

Ordnance Department Solutions and Oil. The following solutions and oil are furnished organizations by the Ordnance Department:

Soda solution. Used for removing the *powder* fouling from the bore.

Standard metal fouling solution. Used for removing the *metal* fouling from the bore.

Swabbing solution. Used in swabbing out the bore after the powder and the metal fouling have been removed.

Sperm Oil. Used in lubricating mechanism and other parts of rifle to reduce friction and also to prevent rust.

Hoppe's Nitro Powder Solvent No. 9. The author would strongly recommend Hoppe's Nitro Powder Solvent No. 9 (sold at all post exchanges) for cleaning out powder residue, and removing leading, nickel, and rust. After cleaning the bore be sure to pass through it a clean patch well saturated with "3-in-One" oil, as it will always prevent rusting in any climate.

The use of this powder solvent, per instructions on bottle, is simpler and less laborious than the use of the Ordnance Department solutions, and it accomplishes the same thing fully as well.

“3-in-One Oil.” The best and most satisfactory oil the author knows of is “3-in-One Oil,” which is sold at all post exchanges. In addition to being a very high grade oil, it is put up in a handy can with a screw-top neck, which makes the most convenient oil container on the market. This oil is used more than any other in the Army, the Marine Corps and the National Guard for cleaning and lubricating rifles and for preventing rust.

How to apply oil. Do not pour or squirt oil on the rifle.

Put a few drops on a piece of clean cloth, preferably cotton, and rub with the cloth, thereby avoiding the use of an unnecessary amount.

Cams and bearings can be oiled this way. However, if the oiler is used instead because of greater ease in reaching them, oil them *lightly*. To soak with oil accomplishes no more than to cover with a light coating,—it merely results in excessive, undesirable smearing and a waste of oil.

Care of the Bore

It requires work. The bore of the rifle is manufactured with the greatest care in order that a high degree of accuracy may be obtained, and it should, therefore, be properly cared for.

The proper care of the bore requires conscientious, careful work, but it pays well in reduced labor of cleaning and in prolonged accuracy life of the rifle, and better results in target practice. •

How to clean the bore. With the cleaning rod the bore must always be cleaned from the breech,—never from the muzzle. Cleaning from the muzzle is liable to

wear and otherwise injure the mouth of the barrel, which is easily injured and thus the piece rendered inaccurate.

First, remove the bolt from the rifle, place the muzzle on the floor, a board or piece of canvas, and do not remove it therefrom while the cleaning-rod is in the bore. Never place the muzzle on the bare ground, lest dirt should get into it. (Note. Of course, if a rack is provided for cleaning rifles, it should be used instead of placing the muzzle on the floor.)

To clean the bore use patches of rag, preferably canton flannel, cutting them into squares of such size that they may easily run through the barrel.

What care of the bore consists of. Briefly stated, the care of the bore consists of removing the fouling resulting from firing to obtain a chemically clean surface, and then coating this surface with a film of oil to prevent rusting.

Kinds of fouling. The fouling which results from firing is of two kinds,—the *powder fouling*, from the burning of the powder; and the *metal fouling*, from the nickel scraped off the bullet as it passes through the bore.

The *powder fouling* is highly corrosive; that is, it causes rust and eats into the metal, and it must, therefore, be removed as soon as possible.

The *metal fouling* itself will not cause rust, but it may cover the powder fouling and thus prevent the cleaning material from getting at the powder fouling, which, as stated before, will eat into the metal. When metal fouling accumulates in noticeable quantities it reduces the accuracy of the rifle.

How to remove powder fouling. Powder fouling may be readily removed by scrubbing the bore with hot soda solution, but this solution has no effect on the metal fouling.

It is, therefore, necessary to remove all metal fouling before we are sure that all powder fouling has been removed and that the bore may be safely oiled.

Ordinarily, after firing a barrel in good condition, the metal fouling is so slight as to be hardly perceptible, and is easily removed by solvents.

However, due to the accumulation of metal fouling, pitting (little hollows in the metal) or the presence of dust, or other abrasives (substances that cause the metal to wear away by rubbing), the fouling may occur in clearly visible flakes or patches and be much more difficult to remove.

How to remove metal fouling. After scrubbing out the bore with the soda solution, plug it from the breech with a cork at the front end of the chamber or where the rifling begins.

Slip one of the 2-inch sections of rubber hose over the muzzle down to the sight and fill with the standard solution to at least one-half inch above the muzzle of the barrel.

Let it stand for 30 minutes, then pour out the solution, remove the hose and breech plug, and swab out thoroughly with soda solution to neutralize and remove all trace of ammonia and powder fouling.

· Wipe the barrel clean, dry, and oil with "3-in-One."

With few exceptions, one application is sufficient, but if all fouling is not removed, repeat the operation.

How to proceed in cleaning the bore.

To clean the bore after firing, proceed as follows:

Swab out the bore with soda solution to remove powder fouling. A convenient way to do this is to insert the muzzle of the rifle into the can containing the solution and with the cleaning-rod inserted from the breech, pump the barrel full a few times.

Remove and dry with a couple of patches of cloth. Examine to see whether any patches of metal fouling are in evidence, and if so, then remove same as explained above. If no metal fouling is in evidence, then swab out with the swabbing solution. The amount of swabbing required with the swabbing solution can be determined only by experience assisted by the color of the patches of cloth. Ordinarily a couple of minutes' work is sufficient. Dry thoroughly, and oil.

As a measure of safety a patch should **always** be run through the bore on the next day and the bore examined to insure that cleaning has been properly done. The bore should then be oiled again.

Necessity for preventing formation of pits. It is a fact recognized by all that a highly polished steel surface rusts much less easily than one which is roughened; also that a barrel which is pitted, fouls much more rapidly than one which is smooth. Every effort, therefore, should be made to prevent the formation of pits, which are merely enlarged rust spots, and which not only affect the accuracy of the piece but also increase the labor of cleaning.

If swabbing solution or standard metal fouling solution is not available, the barrel should be scrubbed

as already described, with the soda solution, dried, and oiled with "3-in-One." At the end of 24 hours it should again be cleaned, when it will usually be found to have "sweated." Usually a second cleaning is sufficient, but to insure safety it should be again examined at the end of a few days, before final oiling.

Of course, the swabbing solution should always be used, if available, for it must be remembered that each "puff" when the bore "sweats" is an incipient rust pit.

What has just been said contemplates the use of the solutions furnished by the Ordnance Department. As stated before, however, the same result will be obtained with less labor if Hoppe's Nitro Powder Solvent No. 9 is used.

How to oil a barrel. The proper method of oiling a barrel is as follows:

Wipe the cleaning rod dry; select a clean patch of cloth and smear it well with sperm or warmed cosmic oil, being sure that the cosmic has soaked into the patch well; scrub the bore with patch, finally drawing the patch smoothly from the muzzle to the breech, allowing the cleaning rod to turn with the rifling. The bore will be found now to be smooth and bright so that any subsequent rust or "sweating" can be easily detected by inspection. (By "sweating" is meant, rust having formed under the coating of metal fouling where powder fouling was present, the surface is puffed up.)

Care of the chamber. The chamber of the rifle is often neglected because it is not readily inspected.

Care should be taken to see that it is cleaned as thoroughly as the bore. A roughened chamber delays greatly the rapidity of fire, and not infrequently causes shells to stick.

The bolt. To clean the bolt, remove; clean all parts thoroughly with an oily rag; dry, and before assembling *lightly* oil the firing-pin, the barrel of the sleeve, the striker, the well of the bolt and all cams.

The sights. Both the front and rear sights should be cared for just as you would care for the works of your watch. If the sights are injured, the rifle will not shoot as aimed.

The front sight cover issued by the Ordnance Department protects the front sight.

The magazine. The magazine should be kept clean and covered with a thin coat of oil.

The stock. The stock should receive a light coat of raw linseed oil once a month, or after any wetting from rain, dew, etc. The oil should be thoroughly rubbed in with the hand.

Care of the mechanism. When the rifle has been wet or exposed to unfavorable climatic conditions, the bolt should be withdrawn, and all working parts carefully wiped with a dry cloth, and then gone over with an oily rag.

The same thing should be done after firing.

All working parts should habitually be *lightly* oiled with a thin-bodied oil, such as sperm oil. ("3-in-One" oil is recommended.)

The care of all metal parts. All metal parts of the rifle should be kept clean and free from rust.

Cams and bearings. All cams and bearings must be kept constantly oiled.

Remember

1. It is easier to prevent than to remove rust.
2. To remove rust, apply oil with a rag, and let it stand for awhile so as to soften the rust; then wipe with a dry rag.

3. Emery paper or a burnisher must never be used in removing rust, for it also removes the bluing.

However, an ordinary rubber eraser will be found very serviceable for removing rust.

4. To prevent rust and dirt in the bore, run a rag through at least once each day.

5. Never, under any circumstances, put away a rifle that has been fired or exposed to bad weather, without first cleaning it.

6. Never lay your rifle flat on the ground. Not only is there danger of dirt or other foreign matter getting into the bore, but a vehicle may run over it, or some one may step on the sight. Always rest it up **securely** against something. On the target range it is well for every soldier to have a short wood or metal fork, as shown in Fig. 5, on which to rest his rifle.

FIG. 5





A Splendid Oil in a Handy Can

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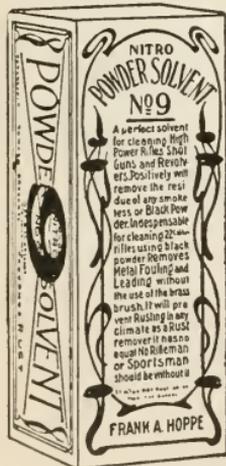
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