

Other Books by Joe Vorisek:

- [American Arms - History of an Arms Maker by Joe Vorisek](#)
- [Belgian Gunmakers with Trademark Names 1909, List of](#)
- [Breechloading Shotgun Old Parts Chart](#)
- [Breechloading Shotguns 1860 -1940 Set of all 3 Volumes - Vorisek](#)
- [Breechloading Shotguns 1860-1940 Vol. I A-F](#)
- [Breechloading Shotguns 1860-1940 Vol. II G-P](#)
- [Breechloading Shotguns 1860-1940 Vol. III R-Z](#)
- [Breechloading Shotguns, Listing of Observed](#)
- [Canadian Gunsmiths 1650-1900 & London Gunsmiths 1850-1900](#)
- [Crescent Arms Trade Brands](#)
- [Digest of Advertising for Firearms and Ammunition 1873-1940](#)
- [DWM Headstamp Codes](#)
- [The Flobert Gun - History](#)
- [Forehand Arms Company, An Illustrated History of the](#)
- [Handgun Trade Brands, U.S. Mfrs & Dist. 1865-1930](#)
- [Harrington & Richardson Arms Co., A Short Illustrated History of](#)
- [Hopkins & Allen Arms Co. Fifty Years of Gunmaking 1867 - 1917; Vorisek](#)
- [Iver Johnson Arms & Cycle Works, A Short Illustrated History of](#)
- [Savage Arms Company History](#)
- [Shotgun Markings Guide 1865-1940](#)
- [Stevens Arms Company History by Joe Vorisek](#)
- [List of Peoples Names and Where They Worked in the US Firearms Industry \(pre 1940\)](#)
- [O.F. Mossberg & Sons, A Short Illustrated History](#)
- [A Basic Reference Guide to Old Firearms \(Serial Nos. etc.\)](#)
- [Belgium, Shotgun Making in \(A Short History\)](#)
- [Breechloading Shotgun Identification Illustrated Guide](#)

Cornell Publications

cornellpubs.com

abby@cornellpubs.com

Publishers of over 5000 old gun catalogs and firearms books

PO Box 214

Brighton, MI 48114

810-225-3075

Note: Some documents are pdf files in landscape format. They are meant to be printed both sides (duplexed) then assembled and folded in the center to be read as a pamphlet.

THE
RIFLEMAN'S HANDBOOK
FOR MILITARY RIFLEMEN

BY
J. G. EWING
Ass't Insp. Gen'l Small Arms Practice
Delaware National Guard

COPYRIGHT 1904
LAPLIN & RAND POWDER COMPANY
NEW YORK, N. Y.

"This little book has my heartiest approval and good wishes. It will be an excellent supplement to the firing regulations, and will tend to stimulate interest in that important accomplishment, 'how to shoot.'"

JOHN F. GUILFOYLE
Inspector Small Arms Practice
U. S. Army.

“WAR IS HELL”

Gen'l W. T. Sherman

Our Civil War lasting five years cost 359,528 lives and \$3,000,000,000.

Our War with Spain lasting one year cost 2,430 lives and \$271,000,000.

The South African War lasting two years and eight months cost Great Britain 12,769 lives and \$938,628,500.

We can avoid war by making the United States a nation of skilled riflemen.

Our nation's peace and tranquility are assured by preparedness for war.

To become a skilled rifleman is therefore a national obligation.

“It is no use to pay, equip, subsist and transport a soldier to the battlefield unless he can hit an enemy when he shoots at him.”

From the last Report of Hon. Elihu Root,
Ex-Secretary of War

Freemantle, Tippins and Hudson have lately contributed valuable and exhaustive works on rifles and rifle shooting. The first two deal more particularly with the service rifle of Great Britain, the latter in his book entitled "Modern Rifle Shooting from the American Standpoint" goes fully into the needs and requirements of those shooting what until recently has been called the United States Gov't rifle—better known as the Krag-Jorgensen. Consequently, if the reader wishes to study rifle shooting as a science the above authors will be found most satisfactory.

This pamphlet is intended as a primer. There is nothing new or original in it excepting the arrangement, the idea being to handle in logical sequence the different steps which lead up to a knowledge of rifle shooting. The subjects have been dealt with as briefly as possible, and in the simplest manner. No other rifle than the Krag has been mentioned because the New Springfield is as yet an untried weapon, and because the National Guard have been and, in all probability, civilian clubs will be, equipped with it. Besides, a man who has mastered the Krag will have no trouble with the New Springfield.

The experience of the writer has been that the expert shot is frequently weak in imparting informa-

THE LAFLIN & RAND POWDER CO.
HAS IN COURSE OF PREPARATION
A WORKING PRINT OF A TARGET
CABINET WHICH CAN BE ERECTED
IN ANY HALL. WHEN CLOSED THE
CABINET IS A HANDSOME PIECE OF
FURNITURE. WHEN OPEN IT SHOWS
THREE TARGETS WITH PROPER AND
SAFE BACKSTOPS, WHILE THE TOP
AND BOTTOM SERVE AS BULLET
CATCHERS.

FOR FURTHER INFORMATION ADDRESS

LAFLIN & RAND POWDER CO.

NEW YORK CITY

THE RIFLE GALLERY

ITS CONSTRUCTION AND USE

BY

MAJOR JAMES E. BELL

Inspector General of Rifle Practice, D. of C. Militia.

This booklet contains much valuable information concerning indoor gallery construction; ammunition; the aiming and sighting drill; loading and reloading. It also contains a short chapter on revolver shooting.

Sent prepaid on receipt of price

10 CENTS

LAFLIN & RAND POWDER CO.
NEW YORK CITY

tion to the beginner. He also assumes that the beginner has no right to annoy the experienced man with questions which he should be able to answer himself. Therefore, a careful study of the subjects in the order hereafter set down is urged.

In some respects we are a patriotic nation, but in others woefully lacking. It would be well for the United States if every man outside of the Regular Army were a National Guardsman, or had served his time as such. It would be well not only for the United States but for each individual, on account of the discipline and training. As this is impossible, the next best loyalty which can be shown is by becoming a good rifle shot.

Rifle shooting as a sport is scientific, entertaining and instructive. It is in the open air and therefore healthful. It teaches observation in details and generalities, as well as temperance and hygiene. And in addition to all these it makes a man a loyal and patriotic citizen and a real defender of his home and fireside.

J. G. EWING.

Wilmington, May 1st, 1904.

INTRODUCTION.

As stated before, the object of this work is to give the beginner a broad general outline of matters which are necessary for him to know and remember in order to become a good shot.

The beginner has his troubles. On the range expert shots are frequently either too busy to impart information, unable to tell how certain results are obtained or forget many minor details which have become fixed habits with themselves. In addition, time spent on the range should be employed in shooting, not in asking questions or wondering how to set the sights for certain conditions.

As a general proposition, and without hurting any one's feelings, the average rifleman is a beginner, and a beginner he remains until he acquires "an intimate knowledge of the possibilities of the arm which is placed in his hands." Until recently the tendency has been to train some fifteen or twenty expert riflemen at the expense of the balance of the regiment. Fortunately that idea has been given up and hereafter a regiment will be known as a shooting regiment according to its percentage of marksmen qualified.

To increase the percentage of merit, therefore, the individual soldier should be given much more care and attention than formerly in the matter of rifle practice, and this should be taken advantage of with eagerness.

The importance of this is splendidly set forth in an article submitted by Lieutenant General Sir Ian Hamilton to the War Commission of Great Britain:

"If the experience of the South African War can be taken as a guide, the big battalion phase is now about to pass away, and we are entering upon a period

THE MILITARY RIFLEMAN'S SCORE BOOK

Designed by W. G. HUDSON, M. D.

The most useful and comprehensive score book published. Has stiff covers. Printed on green tinted paper. Targets for short and mid range shooting. Targets for long range work. Contains the copyrighted table of wind allowances for winds up to 36 miles for the various ranges up to 1000 yards. Also many valuable hints to riflemen.

Sent Prepaid Upon Receipt of Price: 25 Cents

(Special Discount to Military Organizations)

LAFLIN & RAND POWDER CO.

NEW YORK CITY

pany, of New York. It is neatly bound in cloth, finely printed, and profusely illustrated. The most experienced riflemen, as well as beginners, will be benefitted by a careful study of the book, and as it is the only work which deals largely with the Krag-Jorgensen rifle, military riflemen in the Army and National Guard will also find the publication of great value.

FOREST AND STREAM, June 13, 1903.

"Modern Rifle Shooting from the American Standpoint," by W. G. Hudson, M. D., is the latest and soundest contribution to the literature of the rifle, both concerning its theory and practice, which has appeared in many months.

The work is copyrighted by Laflin & Rand Powder Co., New York, and in it is contained more accurate knowledge than the unassisted rifleman could acquire in a lifetime.

THE WASHINGTON POST, June 15, 1903.

This book on "Modern Rifle Shooting" by Dr. W. G. Hudson, is designed to furnish to the beginner as well as the experienced rifleman information derived from investigation and experience by the author which will be of interest and assistance in shooting, both as a sport and a defense.

ROD AND GUN, Canada.

Dr. W. G. Hudson is a recognized authority upon rifle shooting. . . . Few, if any, works upon the rifle have contained more "meat" than this little work.

SPORTSMAN'S REVIEW, June 15, 1903.

Under the title of "Modern Rifle Shooting from the American Standpoint," a compact yet comprehensive work has been prepared by Dr. W. G. Hudson. It is a volume full of practical information, and is written in an entertaining manner. It is hoped the publication of this book may stimulate practice and proficiency in rifle shooting, and that before the lapse of another quarter century, it may again be truly said—as it was a hundred years ago—"Americans are a nation of riflemen." The instructions are clear and concise, the illustrations are excellent, and the book is one worthy the careful perusal of everyone who feels an interest in rifle shooting.

Sent Prepaid Upon Receipt of Price, One Dollar

LAFLIN & RAND POWDER CO.

NEW YORK CITY

when the efficiency of an army will depend far more upon the moral and high training of the individuals who compose it than upon the mere numbers of these individuals who may be available. I believe that an army composed of individuals each so highly trained as to be able to take full advantage of the terrain and of his wonderful modern weapon, and each animated with a moral and trained to an efficiency which will make him capable of acting in battle on his own initiative, will break through, scatter and demolish less efficient opposing forces, even if greatly superior in numbers."

"Discipline there must be, but it must be discipline on a higher plane. It must be the aim of the new discipline to make the private soldier capable of keeping steadfastly in mind for the whole of the day, or even for several days, and striving with all his might to carry out what he has been told by a superior who is no longer present, and who, for all he may know, is dead. Within a mile of the enemy and in open country it will no longer be possible for the brigade major to gallop up to the colonel with a folded piece of paper describing his next movement, nor can the colonel send his adjutant to tell the captain to change direction or reinforce. Within 1000 yards of a hostile position the captain can hardly hope any longer to influence the company as a whole by orders, or even by personal example, and the idea of swarms of men surging forward by word of command to the assault of a position is one which we should do our best to encourage among our potential enemies."

"It is the magazine rifle with its smokeless powder which is at the root of this startling and imminent change in both tactics, which I have endeavored shortly to indicate.

"The modern firearm has been improved and perfected far more rapidly than the soldier. We want an army composed of men, each of whom can be trusted to make the fullest possible use of the finest and most delicately adjusted rifle that can be made, etc."

Many of the European nations have recognized this fact. The little country of Switzerland has practically made itself impregnable by a magnificent system of rifle practice, which, for her population, has placed her easily first in the number of qualified sharpshooters.

Disciplined by woful experience England to-day is straining every nerve to educate the individual rifleman, and one is forcibly impressed with the idea that in her next war the British soldier will know how to shoot.

The United States, with its vast area and small standing army, must awaken to the fact that only by being strongly prepared for war will peace be maintained. We have been called "The Commercial Nation," and it has been believed by many that armed strength merely makes for war. The opposite is the real truth, for if this nation with its eighty millions of people can show that it has one million or more trained marksmen, our dwelling in peace and amity with other nations for many years to come will be more than a dream.

Fortunately, not only the government, but many prominent men throughout the country have come to a realization of this. President Roosevelt recently said to a committee of riflemen which called on him, "You may put a uniform on a man and a rifle in his hand and then drill him; but, if you do not educate him *how to shoot that rifle, and shoot to hit the object,*

MODERN RIFLE SHOOTING FROM THE AMERICAN STANDPOINT

BY

W. G. HUDSON, M. D.

REVIEWS AND PRESS CRITICISMS

LIBRARY BUREAU, Boston.

"This book should certainly be in every library."

THE JERSEY GUARDSMAN.

A blue book by Dr. W. G. Hudson, under the title of "Modern Rifle Shooting from the American Standpoint" has just been issued from the press of the Laflin & Rand Powder Company. The book is a revelation to the reader, a monument to Dr. Hudson's well-known skill and a credit to the progressive concern which has published it. If ever there was a book with a blue cover worth reading, it is certainly this one. Within its pages may be found a clear exposition of the art of handling an American rifle. In language concise, clear-cut and graphic, the author tells how to select a gun, how to use it and how to care for it, incidentally making public information of the utmost importance not only to the recruit at the ranges, but to the man who has been making fours and fives all his life.

AMERICAN FIELD, June 13, 1903.

"Modern Rifle Shooting from the American Standpoint," by W. G. Hudson, M. D., is the title of an attractive hand-book on the modern rifle, how to select and use it, just published by the Laflin & Rand Powder Company. The work is of convenient size to carry in a rifleman's kit or pocket, and one which no rifleman should be without. It contains much that has never been found in any manual published, much that old riflemen will find valuable and which will be invaluable to the novice. His ideas of the rifle, together with its equipment, what it is capable of, the ammunition for and how to select the same is gone into with much detail, much more so than in any work that we have had the privilege of examining and can be relied on as being correct so far as any one man can formulate a set of rules to govern any other. The information that it contains regarding the modern rifle and its ammunition makes it invaluable.

FIELD AND FANCY, June 13, 1903.

"Modern Rifle Shooting from the American Standpoint," by W. G. Hudson, M. D., a well known rifle expert, is the title of a valuable little volume of 165 pages, published by Laflin & Rand Powder Com-

THE MIRAGE

Very few days will be found when the mirage cannot be taken advantage of, and the mirage is by long odds the most reliable method of judging the wind, especially if it is a fish tail—a fish tail wind is one which switches about from left to right and from right to left. To get the best view of the mirage focus your glass upon the target and then throw it slightly out of focus until you can see the heated air—or bubbles, as some riflemen call them—at the base of the target most distinctly. The way this heated air travels shows just what the wind is doing, so that sudden shifts, which would take some time for the flags or wind clock to show, can be guarded against.

When shooting in a fish tail wind and using the mirage, it is often desirable, instead of changing the wind gauge, to allow for fluctuations by changing the point of aim, holding under seven or five o'clock according to the changes of the wind, and if the mirage streams out more strongly to hold just outside of eight or four o'clock on the target. Otherwise you will frequently find that by the time you have changed your wind gauge it will have to be reset to meet a new condition.

another man can come along with a club and put him out of business."

Secretary Root, of whom the Army and Navy Register says, "There has been no better Secretary of War than he has been. He has accomplished more than most of his predecessors," says in his final report:

"I know of nothing more important in the way of preparation for war than teaching the young men of the country to shoot straight. It is especially important to the efficiency of our volunteer armies in the future. It is of no use to pay, equip, subsist and transport a soldier to the battlefield unless he can hit an enemy when he shoots at him. The recent changes in conditions require that we should make continuous and active effort in this direction if we are to have this necessary element of efficiency. One is the greatly increased range of rifles which determines battles while the combatants are at great distances from each other, and which makes practice more necessary for good marksmanship than ever before. *The time to give that instruction is now.*

We ought not wait until we are actually engaged in hostilities. When that time comes the enemy will not wait for us to give the instruction."

Major General Corbin, Adj. Gen. of the Army, and now commanding the Department of the East, recently made this statement before a National Guard regiment of New York City:

"Unless we have for those new improvements and discoveries competent and thoroughly trained officers, the new arms can be of little more value than those that are now reckoned as obsolete. As a matter of fact, the new modern rifle in the hands of the novice is little more effective than the old one. To make the new guns effective, they must be in the hands of

men trained to their use. At point blank range, they are effective at only about 250 yards. This fact in itself suggests that the higher duty of the Infantry and Cavalry soldier is an intimate knowledge of the possibilities of the arm which is placed in his hands. With this working knowledge he becomes an efficient soldier. I can think of nothing that would make the country stronger in the hour of peril than among the National Guard and militia, and citizens in general, a practical knowledge of small arms firing. This can only be accomplished by long practice, and belongs to the preparation that must be made before, rather than after war is declared."

These opinions cannot be ignored. Emanating, as they do, from men who have gone into the subject thoroughly, and who speak with conviction, it behooves us as a nation to heed their notes of warning.

The relative cost of maintaining public ranges and furnishing ammunition for twenty years would be a mere drop in the bucket to the cost of our last war, which lasted only two years and which was with a poor and demoralized nation. In other words, if two million dollars a year were appropriated to the Board For The Promotion of Rifle Practice to be spent in building and maintaining ranges; in furnishing ammunition and offering prizes for efficiency in marksmanship, the benefit to our nation could not be told in words. We would not only have a million sharpshooters trained to the defense of their country in case war should come, but we would have a million and more men with clear eyes, trained to temperate habits, to keenness of observation, to nicety of detail and to a healthful way of living.

More than this amount is wasted yearly. Could forty million dollars be better spent?

SUMMARY

Become skilled in estimating distances. Be courteous to others—answering questions. Be courteous to yourself—keep your body in good health.

A clear eye, calm nerves and rested muscles are indispensable to good shooting.

When trying to find the target at the long ranges do not make slight changes if a miss is recorded. Change materially either your windage or your elevation.

FURTHER SUGGESTIONS ON FINDING AND HOLDING THE TARGET

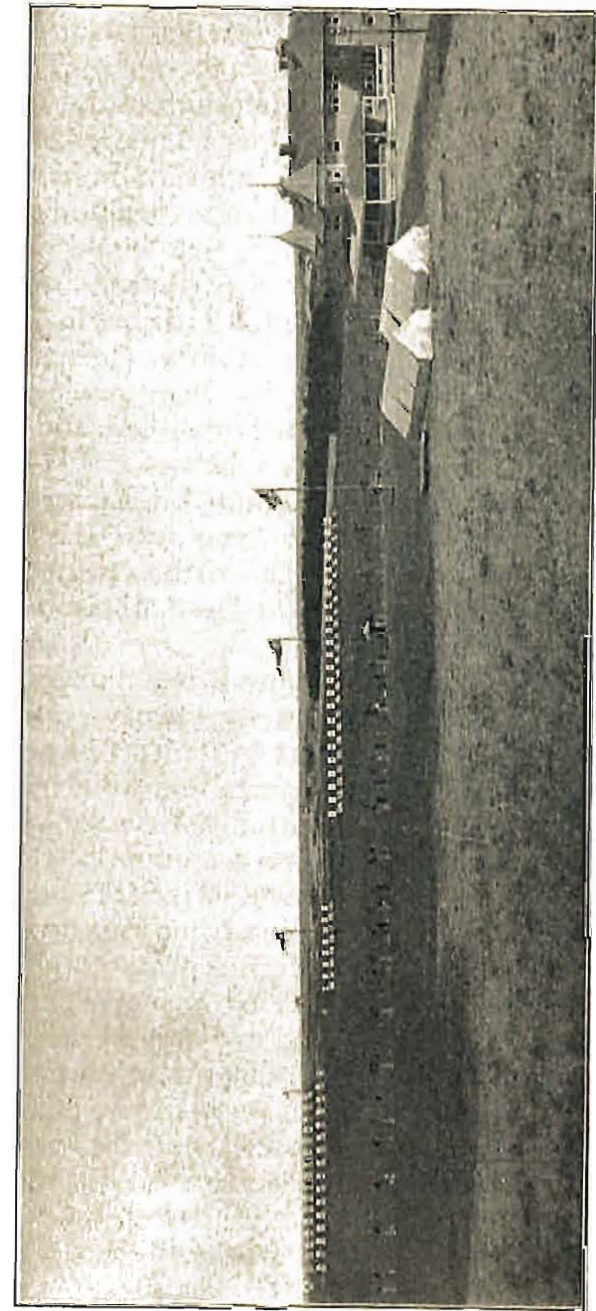
Unless an extremely strong or puffy wind is blowing the chances are always in favor of your overshooting the target, more especially at 800 or 900 yards. As a rule, under fair climatic conditions, your sight for the 800 yard range should be set at from 710 to 750 yards, depending upon the sight taken and the shooting qualities of your rifle. 900 yards will require a trifle higher corresponding elevation, say about 820 to 860 yards; while at 1000 yards it is not advisable to go below 950 yards elevation.

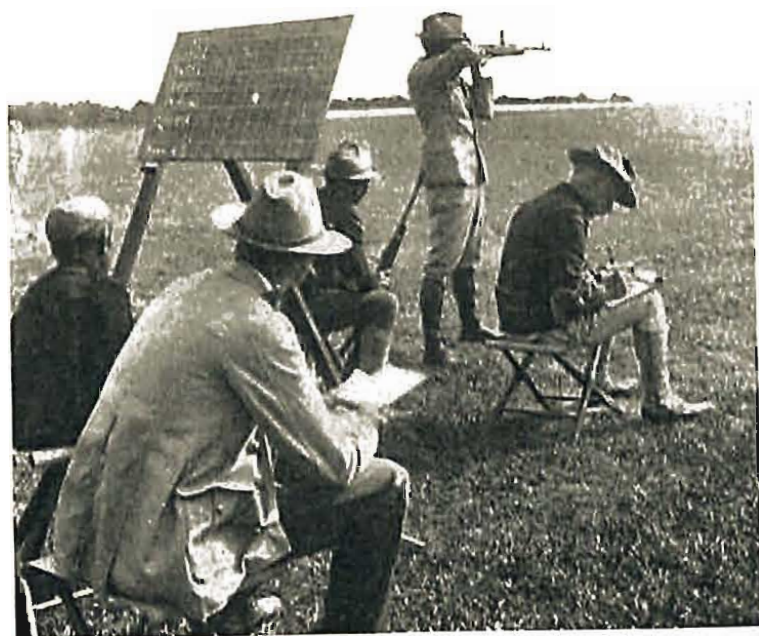
Of course these figures are arbitrary and are only given as suggestions, but as a rule you will find that the elevation required is less than the range shot over.

especially so when firing in a puffy wind or in an alternately bright and dark light, as the fixed sight, a certain point of aim, and the conditions existing at the second shot, all form a valuable basis for comparison with the subsequent conditions.

Whenever firing in a puffy wind, or in one subject to frequent changes in direction, the soldier should as far as possible, endeavor to fire his shots under similar conditions, waiting a short period whenever necessary until they become the same as those in which previous shots were fired. If this can be done he will be able, without corrections in the sight, to hold on the figure throughout the score."

Another matter of importance to make you an expert shot on the range is courtesy. Not only courtesy to others but to yourself, courtesy to your stomach, courtesy to your muscles. A clear eye, calm nerves and rested muscles are indispensable to good shooting. If in addition to this you are courteous and obliging to other riflemen, answering questions concerning elevation, wind and other conditions to the best of your ability, you will find that your scores will be improved, not only on account of the frame of mind which good nature always puts one in, but also because you yourself will learn a great deal from these questions and answers. At the same time, you will be doing your share towards developing good shots for your nation.





CHAPTER I.

Any one who expects to do successful shooting must first familiarize himself with the working parts and sights of his rifle. Some men can do excellent shooting if their rifles are attended to, their sights adjusted, and the wind and elevation called for them; they are good holders, not good shots, and would only be in the way on the firing line. The good mechanic always keeps his tools in first class condition. The man who is to become a good shot, and therefore a good soldier, must know and take care of the parts of his rifle. By this is not meant that you should fool with the mechanism. Study the cuts in the following pages, read the descriptive matter, but unless you are sure you can reassemble the parts *do not dismount them unless under the instruction of some one who knows.*

from the firing point, while a shot over the target might not.

If firing at 500 or 600 yards, when very great errors in the elevation are improbable, it should be decreased sufficiently to lower the second shot about half the height of the target; but if firing at 800 or 1,000 yards, the greater chances for error make it more advisable to change the elevation enough to produce a fall in the bullet equal to about three-fourths of the height of the target.

If on the second shot the target is not hit, increase the elevation above its first allowance as much as it was previously lowered. If a miss still results, lower again, but to double the amount first selected, and if a hit is not yet made, increase the original elevation by this latter amount.

It will often be advisable to combine the horizontal and vertical methods of feeling for the target, alternating in successive shots the direction in which the allowances are made. The soldier must not temporize or make these corrections in a feeble manner; if unhesitatingly applied, and with their full value, the target will generally be quickly found; whereas if only slight changes are made, a number of shots, especially at the long ranges, may be fired without the nature of the error being discovered, or a hit obtained.

If the target is hit on the first shot and the allowances then made result in a 5 or close 4 for the second shot, the sights should not be changed during the remainder of the score; but the variations which may occur in the conditions affecting the elevations or wind allowances, unless they are very considerable, should be allowed by altering the place on the target upon which the rifle is held.

This method, while generally advantageous, is

obtained, it will generally be safest to assume that a sufficient allowance was not made and that the shot passed the target on the side opposite the wind. The point of aim should be changed toward the wind a distance corresponding to three-fourths of the width of the target. If the direction of the error has been correctly judged, this will change in the next shot, if firing at short or mid ranges, a very close miss into a 4, well out on the opposite side of the target, or a miss of 1 or 2 feet into a 5 or a 4 on the same side of the target. At long ranges a very close miss would be changed to a 3 on the opposite side of the target, misses of 1 or 2 feet to 4's or 5's. If firing at 600 yards, a miss of 4 feet, if at 1,000 yards one of 8 feet, would be brought on the target.

After correcting in this manner, if the target is not found on the second shot and the soldier is still convinced that his errors are horizontal rather than vertical, he was probably mistaken as to the side on which the misses were made. If, for instance, he has been moving the point of aim to the right, it should now be moved to the left and to a distance beyond the position originally selected for the first shot equal to the correction made for the second shot.

If the target is again missed, make the correction in the direction first chosen, but with double the amount first selected. If still a miss, then apply this double correction in the opposite direction. If, after these different trials, no hit is obtained, abandon the theory of lateral errors and alter the elevations.

Whenever making changes in the elevation, after missing on the first shot, and there is nothing to indicate whether the shot was too high or too low, it is generally safest to assume the former to be the case, as a low shot will often raise the dust visible

LOADING MECHANISM OF THE U. S. 30 CALIBRE
MAGAZINE RIFLE

Through the courtesy of General William Crozier, Chief of Ordnance, U. S. A., illustrations of part of the loading mechanism of the U. S. Magazine Rifle, Model of 1899, are produced for the information and instruction of the soldier, with descriptive language employed by the Ordnance Department in reference thereto, which, in part, appears under the following headings. First—the Assembled Parts and their Operations. Second—Precautions. Third—Dismounting and Assembling by Soldier.

THE ASSEMBLED PARTS AND THEIR OPERATION

Most of the operating parts may be included under the Bolt Mechanism and the Magazine Mechanism.

The Bolt Mechanism consists of the bolt, sleeve, extractor, extractor rivet, safety lock, firing pin, striker, and main spring.

The bolt moves backward and forward and rotates in the well hole of the receiver; it carries a cartridge, either from the magazine or one placed by hand in front of it, into the chamber and supports its head when fired. The locking lug will sustain any powder pressure liable to occur, but if worn by usage or upset by excessive pressures the rear end of the guide rib will bear on the locking shoulder of the receiver, permitting the continued use of the arm with safety.

The sleeve unites the parts of the bolt mechanism; its rotation with the bolt is prevented by its arm occupying the opening between the walls of the receiver.

The hook of the extractor engages the rim of the cartridge case and retains the head of the latter in the countersink of the bolt until the case is ejected. The extractor spring, engaging its lip on

the receiver, prevents the hook from releasing the rim of the cartridge case, when the latter is being started from the chamber. The extractor pin holds the bolt open for convenience in loading when using single-loader fire.

The safety lock, when turned to the left, is inoperative; when turned to the right, the point of its spindle enters the notch in the bolt collar and locks the bolt. If turned to the right when the piece is cocked, its cam forces the firing pin slightly to the rear, out of contact with the sear, so that, if the trigger be pulled, the sear, when the trigger is released can rise to catch the firing pin, when the safety lock is turned to the left, thereby preventing accidental discharge. If turned to the right, when the piece is not cocked, it locks the firing pin as well as the bolt.

The gun having been discharged, to remove the empty cartridge case, reload and fire, the bolt mechanism operates as follows:

To open the bolt raise the handle until it comes into contact with the sleeve, then pull it directly to the rear until the locking lug strikes the locking shoulder of the receiver.

Raising the handle rotates the bolt. This separates the locking lug from the shoulder of its recess in the receiver, with which it is brought into close contact by the powder pressure. This separation is made easy by the slight inclination to the axis of the receiver of the vertical planes containing the rear surface of the locking lug and the shoulder of its recess.

The rotation also causes the cocking cam of the bolt to force the firing pin to the rear, withdrawing the point of the striker into the bolt. The rotation of the firing pin is prevented by the lug on the cocking piece projecting through the slot in the

366 yards per second. If a gun is fired at a distance a certain time elapses before the sound is heard. If the number of seconds or parts of seconds between the flash and the report be carefully taken and multiplied by 366, the product will be approximately the distance in yards to the gun.

This method will be of use on the battlefield in correcting the estimate of distance to a hostile battery.

Proficiency in estimating distance is necessary to qualification in firing in any class. Failure to attain it lowers the qualification one grade. Thus, if a sharpshooter, as qualified by firing, fails to attain the proficiency required for the sharpshooter in estimating distance, he shall be finally rated as a marksman in the annual report.

No separate report of estimating distances will be required."

The "Firing Regulations" also gives some excellent aids for finding target, also for keeping the target when it is once found. We therefore quote again—

"If a shot misses the target and no dust or other indication of the nature of the error is noticed, the direction of the miss must be inferred from the conditions of the weather. If a strong side wind was blowing, the miss was more than likely to either the right or left; if there is but little wind, if the day is either exceedingly dry or very damp, very bright or very dark, or if there is much mirage, or a strong wind in the direction of the plane of fire, the elevation assumed was probably incorrect.

In the first case, if the soldier from long firing has discovered the usual nature of his errors in estimating the deviating effect of the wind, he will be able to judge on which side of the target the miss was probably made. If this knowledge has not been

mating long distances the following methods are found useful:

1. The soldier may decide that the object can not be more than a certain distance away, nor less than a certain distance; these must be kept within the closest possible limits and the mean of the two taken as the range.

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

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

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

During this instruction, the men should be also taught the effect of the different conditions of light, earth's surface, etc. That objects seem nearer:

1. When the object is in a bright light.
2. When the object is different in color from the background.
3. When looking over water, snow, or
4. A uniform surface without intervening objects, like a wheat field.
5. When looking from a height downward.
6. In the clear atmosphere of high altitudes.

That objects seem more distant—

1. When looking over a depression in the ground.
2. When there is poor light or a fog.
3. When only a small part of the object can be seen.
4. When looking from low ground upward toward higher ground.

Sound travels at the rate of about 1,100 feet, or

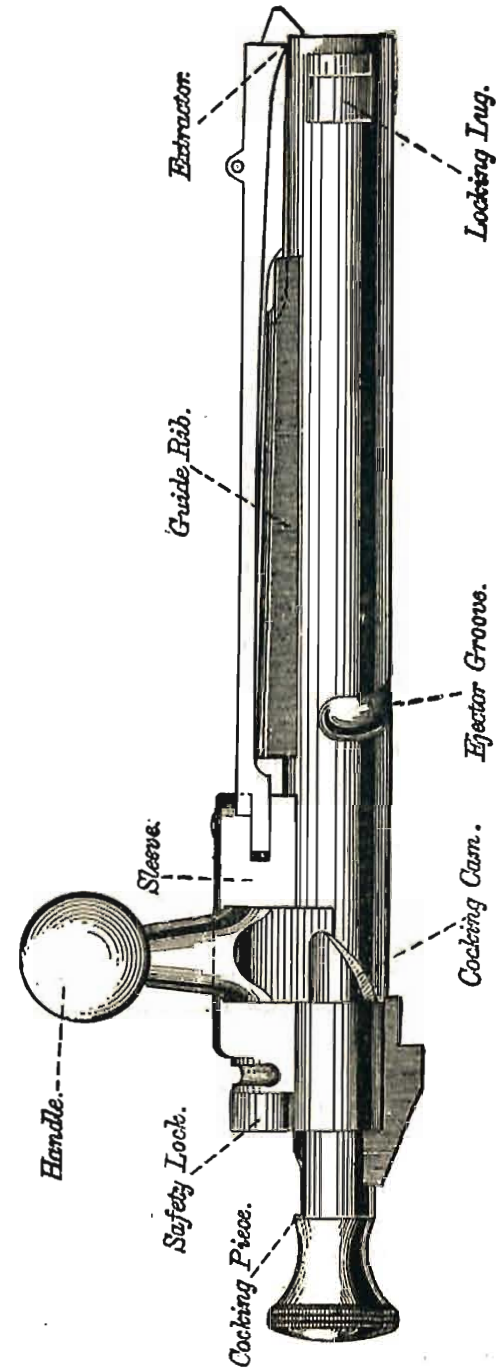


Figure 111

sleeve into its groove in the receiver. As the sleeve remains longitudinally stationary with reference to the bolt, this rearward motion of the firing pin, and consequently of the striker, will begin the compression of the main spring, since the rear end of the latter bears against the front end of the barrel of the sleeve, and the front end against the rear end of the striker.

When the bolt handle strikes the sleeve, rotation ceases, during which the firing pin has been forced to the rear by the cocking cam on the bolt until the sear notch of the cocking piece has passed the point of the sear, the cocking piece nose entered the notch in the rear end of the bolt, and the main spring partly compressed; the locking lug will then be out of its recess and the guide rib under the extractor.

When the bolt handle is raised into contact with the cam on the cocking shoulder of the receiver, a direct motion to the rear will be combined with the rotation, so that the cartridge case will be started from the chamber by the action of this cam.

The bolt is then drawn directly to the rear, the extractor and guide rib move along the left wall and through the opening between the two walls of the receiver. The parts are retained in position by the cocking piece nose remaining in the notch in the rear end of the bolt, and the main spring is partly compressed.

The relative position of the parts of the bolt mechanism is then shown in Fig. 111, page 14.

To close the bolt, push the handle forward until it strikes the cocking shoulder, then turn it down until it comes into contact with its seat in the receiver. As the handle is turned down, the rear end of the guide rib, traveling along the cam of the locking shoulder of the receiver, will move the bolt forward

The following directions taken from the "Firing Regulations for Small Arms," 1904 edition, issued by the War Department, should be studied carefully:

"The soldier should be taught that in judging his distance from an enemy his estimate may be corrected by an observance of the following facts, which will be found true under ordinary conditions with the average eye:

At 30 yards the white of a man's eye is plainly seen, and the eyes themselves up to 80 yards.

At 100 yards all parts of the body are seen distinctly, slight movements are perceptible, and the minute details of the uniform can be distinguished.

At 200 yards the outlines of the face are confused and the rows of brass buttons look like stripes.

At 400 yards the face is a mere dot, but all movements of the legs and arms are still distinct.

At 600 yards details can no longer be distinguished, though the files of a squad, if the light is strong can be counted.

At 800 yards the men in a squad can not always be counted, nor their individual movements distinguished.

At 1000 yards a line of men resembles a broad belt; the direction of their march can, however, be readily determined.

At 1,200 yards infantry can be distinguished from cavalry.

At 2,000 yards a mounted man usually appears as a mere speck or spot.

To impress these facts upon him, men acting as markers should be posted at various distances, and in different positions, and the soldier questioned as to their appearance and in what respect it differs."

The same work goes on to state that "in esti-

CHAPTER V.
GENERAL OBSERVATIONS

After you have mastered shooting at all ranges there is still one thing required to make you a perfect marksman, and that is skill in estimating distances. As the time passes, more and more attention will be paid to firing at unknown distances, and if you have practiced at this you will be in the front rank of shooters.

Estimating distance requires no rifle or range. It can be done anywhere and at any time. On the range you can easily determine how many steps are needed for you to walk 100 or 200 yards; then when you are walking in the town or the country select an object which appears 500, 600, 800 or 1000 yards away, and count the number of steps required to reach it. If you get three or four other shooters to accompany you for an afternoon now and then, you will have a most pleasant and profitable time.

Your first attempts at estimating distances will prove very interesting and probably very amusing. The writer remembers one morning at Sea Girt during the competition for places on the American Team for the Palma Trophy Match in England. There were thirty-five or forty of the most expert shots in the United States sitting about on the Club House porch. Some one asked how far a certain fence was, and immediately every man estimated the distance. After much good-natured bantering the distance was paced. The result was ludicrous. The distance had been overestimated by every one. Two men came within 50 yards of it, while the majority were 200 yards out of the way. And yet twelve of those men went to England and won the biggest international rifle match the world has ever seen.

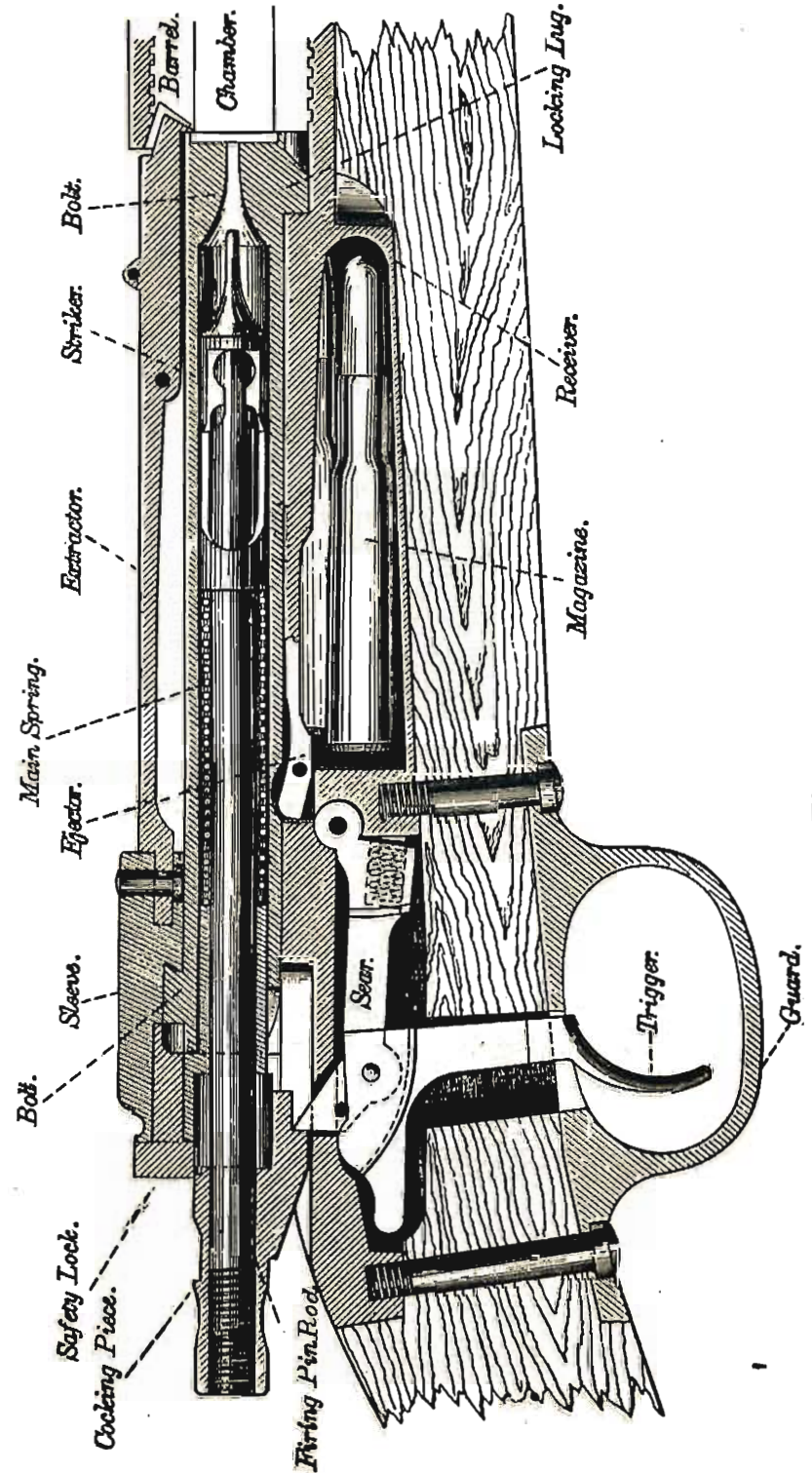


Figure 112

until the locking lug comes into contact with the cam of its recess in the receiver, which moves the bolt slightly forward into its closed position. As all movement of the firing pin is prevented by the point of the sear engaging the sear notch of the cocking piece, the forward movement of the bolt, produced by these cams, completes the compression of the main spring, the seating of the cartridge in the chamber, and forces the extractor hook over the rim of the cartridge case.

In closing the bolt, a cartridge from the magazine, if using magazine fire, or one placed by hand in the well of the receiver in front of the bolt, will be carried forward into the chamber. The gun is then ready to be fired.

The position then occupied by the parts is shown in Fig. 112, page 16.

When the bolt is rotated so the guide rib is under the extractor, the front end of the guide rib engages a lug on the underside of the extractor and holds the latter against the left wall of the receiver so the hook, as the bolt is closed, will enter its notch in the receiver and barrel.

To pull the trigger the finger-piece must be drawn to the rear until contact with the receiver is transferred from its bearings to the heel which gives a creep to the trigger, and then until the point of the sear is withdrawn from in front of the cocking piece.

The heel of the ejector rises into its groove in the bolt, but just before the bolt is drawn fully to the rear, the end of the groove suddenly forces the heel down, causing the point to rise in front of the bolt and strike the cartridge case. As the bolt is closed, the heel rises again into its groove, the curved portion of which permits the bolt to rotate

SUMMARY

Zero your rifle.

Get a good score book and read it carefully. (The L. & R. Red Score Book is best.)

Raise your sight in cold weather; when the wind is blowing in your face from the targets; when the light gets less; when your front sight has a bright light on it; when there is much vapor or mirage.

Lower your rear sight when it's hot and clear; when the wind blows from you toward the target; when your target is bright and your sights dark; when the vapor or mirage is clearing.

Learn to judge the force and direction of the wind; study the flags and the mirage.

Company has produced a powder called "Marksman" Smokeless, 14 or 15 grains of which does excellent work with a lead bullet up to 500 yards. (By lead bullet is meant an alloy bullet of lead, tin and anti-mony in the ratio of 80-10 and 10.)

"Marksman" Smokeless is practically the only powder which gives sufficient velocity to obtain satisfactory results at 500 yards without fusing the base of the lead bullet—a most important consideration, as a bullet fused at the base will not shoot accurately. The service charge for the Krag as furnished by the Government is from 34 to 35 grains of "W.-A. 30 Cal." powder and a 220 grain metal jacketed bullet in the regular Frankford Arsenal 30-40 shell.

RELOADING

These shells are capable of being reloaded many times, repriming with the U. S. Gov't H. .48 primer and using the Universal Powder Measure of the Ideal Mfg. Co. for charges of either "Marksman" Smokeless or "W.-A. .30 Cal." Bullets for "Marksman" Smokeless can either be cast or procured from the Ideal Mfg. Co. of New Haven, Conn. Metal cased bullets can be procured from the Government or from leading metallic ammunition manufacturers, such as the Union Metallic Cartridge Co., the Winchester Repeating Arms Co. or the Peters Cartridge Co. These companies also furnish primers. When, therefore, a regiment, a company or an individual is once supplied with shells reloading is a simple matter and a great saving. The Ideal Company above mentioned make reloading machines and furnish complete information regarding same.

without operating the ejector. The upper surface of the front end of the ejector is shaped so as to throw the cartridge case out of the receiver, upward and to the right.

It is to be noted that, in this system of bolt mechanism, the compression of the main spring, the seating of the cartridge in and the starting of the empty case from the chamber, are entirely done by the action of cams.

The piece may be cocked either by raising the bolt handle until it strikes the sleeve and then immediately turning it down, or by pulling the cocking piece directly to the rear.

In firing, unless the bolt handle is turned fully down against its seat in the receiver, the cam on the cocking piece will strike that in the rear end of the bolt and the energy of the main spring will be expended in closing the bolt instead of on the primer; this prevents the possibility of a cartridge being fired until the bolt is fully closed.

The opening and the closing of the bolt should each be done by one continuous motion.

PRECAUTIONS

If it is desired to carry the piece cocked, with a cartridge in the chamber, the bolt mechanism should be secured by turning the safety lock to the right.

To obtain positive ejection, and to insure the bolt catching the top cartridge in the magazine, when using magazine fire, the bolt must be drawn fully to the rear in opening it.

If a cartridge is pushed from the magazine partly into the chamber, and then the bolt fully drawn to the rear, that cartridge will remain in the well and chamber, and a second will rise from the magazine in front of the bolt. If the bolt is again pushed

forward, the second cartridge will strike the first and produce a *jam*. To avoid this always close the bolt on a cartridge in front of it to insure the action of the extractor and ejector on that cartridge when the bolt is opened.

If a jam occurs, draw the bolt fully to the rear and, with the right hand, remove the first cartridge and close the bolt; if the first cartridge has been pushed into the chamber, draw the bolt to the rear, with the thumb of the right hand push the second cartridge back into the magazine and cut it off; then close the bolt on the first cartridge.

Unless the bolt handle is fully turned down into contact with its seat in the receiver, when the trigger is pulled the nose of the cocking piece will strike against the cocking cam of the bolt, and the energy of the main spring will be expended in closing the bolt instead of in igniting the primer, causing a miss-fire. Care should be taken not to raise the bolt handle with the forefinger if the trigger is pulled with the middle one.

It is essential for the proper working and preservation of all cams that they be kept lubricated.

DISMOUNTING AND ASSEMBLING BY SOLDIER

The bolt and magazine mechanism can be dismounted without removing the stock. The latter should never be done except for making repairs, and then only by some selected and instructed man.

TO DISMOUNT BOLT MECHANISM

1. Draw the bolt fully to the rear, then place the piece across hollow of left arm.
2. Lift the front end of hook of extractor off bolt with left thumb, and at the same time turn bolt

the clock, and to other flags in different parts of the range. On the other hand, if there is much mirage visible through the telescope, its movement often affords more reliable indications than either flags or clock; for in observing the mirage through a telescope trained on the target, we practically see the movement of the air through which the bullet must pass in its flight, and are not (mis-) guided by what is taking place far off to the one side where the flags and clock are located. In addition, the apparent movement of the mirage seems to average up the total amount of lateral deflection, which is certainly better than having to watch several flags and a dial, even if they are close to the line of fire. It was our unfamiliarity with this method of estimating wind which lost us the international match at Ottawa, Canada, in 1902; for at the 900 yard stage very unfavorable conditions arose, which it was absolutely impossible for the best coaches to judge by the flags. But the English team, who were familiar with the mirage method, did nearly as good shooting as when the weather conditions were good."

It might be well to add that on July 11, 1903, an American team met the Britishers on their own ground, at Bisley, England, and, in competition with seven foreign teams, won the Palma Trophy by a score of 1570 to 1555. We had studied the mirage method ourselves during the intervening year.

AMMUNITION

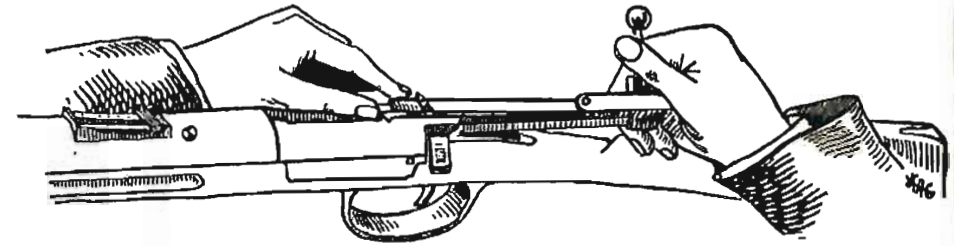
In the majority of instances the ammunition furnished for outdoor work will be of Government manufacture, using metal cased bullets. When trying to qualify a large number of men as marksmen the expense of service ammunition is quite a drain on a State's appropriation. As in most cases economy is desirable, the Laflin & Rand Powder

It is evident that a 6 o'clock or a 12 o'clock wind will cause no lateral deflection of the bullet, and that a 3 o'clock wind will cause the greatest deflection. But what proportion of the total 3 and 9 o'clock effect the oblique winds will have is a subject that demands study. Mr. Tippins, an eminent British rifleman, says that 1, 5, 7 and 11 o'clock winds have 1-3 the effect of 3 and 9 o'clock winds of the same force, and 2, 4, 8 and 10 o'clock winds 2-3. But it has seemed to me that with our American rifle there is much less difference between a 2 and 3 o'clock wind than there is between a 1 and 2 o'clock, or between a 12 and 1 o'clock. From my records kept since the Krag first came into the hands of the civilian rifleman (1900) I have formulated the table on pages 48-49. This is scarcely a long enough experience by which to construct a perfect table, but mine appears so far to be approximately correct, and I hope that such discrepancies as become manifest—and they are not likely to be very great—will be corrected by the rifleman for his own gun.

In addition to the flags with which every rifle range is supplied there is generally a device known as a wind clock, consisting of a vane so geared to the single hand on a large clock dial, that when the wind is blowing from a given direction the hand points to the corresponding number on the clock. On most of the American rifle ranges it has been the custom to estimate the necessary wind allowance by observing closely the flags and clock dial, and these certainly afford quite reliable indications as to what is taking place in their immediate vicinity. But in inland ranges there are likely to be many local currents far different than the wind affecting the clock or some of the flags. Indeed, some of the flags may indicate precisely the opposite direction to

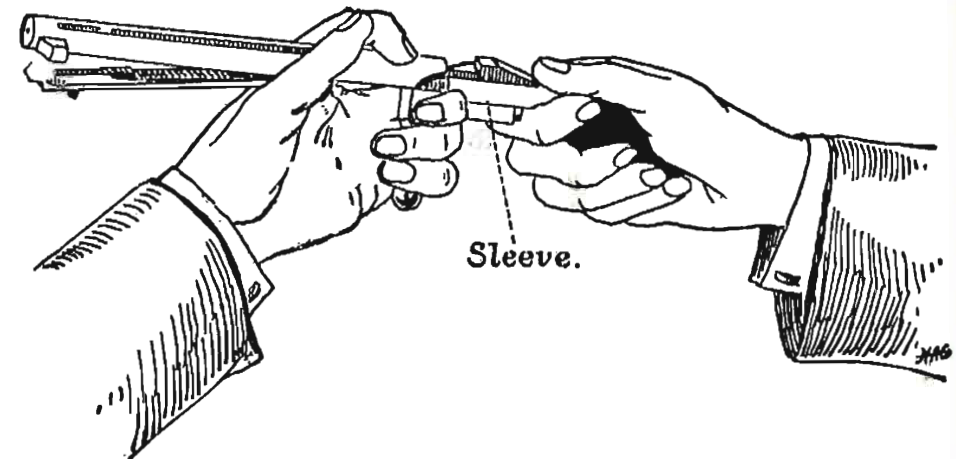
handle to left with right hand (see Fig. 117). The bolt can then be drawn from the receiver.

FIG. 117



3. Take bolt handle in left hand, back of hand down, bolt upside down. Grasp cocking piece with right hand (Fig. 118).

FIG. 118



4. Slightly draw back cocking piece and turn it toward the operator until the firing pin can be removed from the bolt.

5. Take firing pin in left hand and bear down on point of striker with right thumb until it leaves the firing pin; remove mainspring from firing pin and the latter from sleeve.

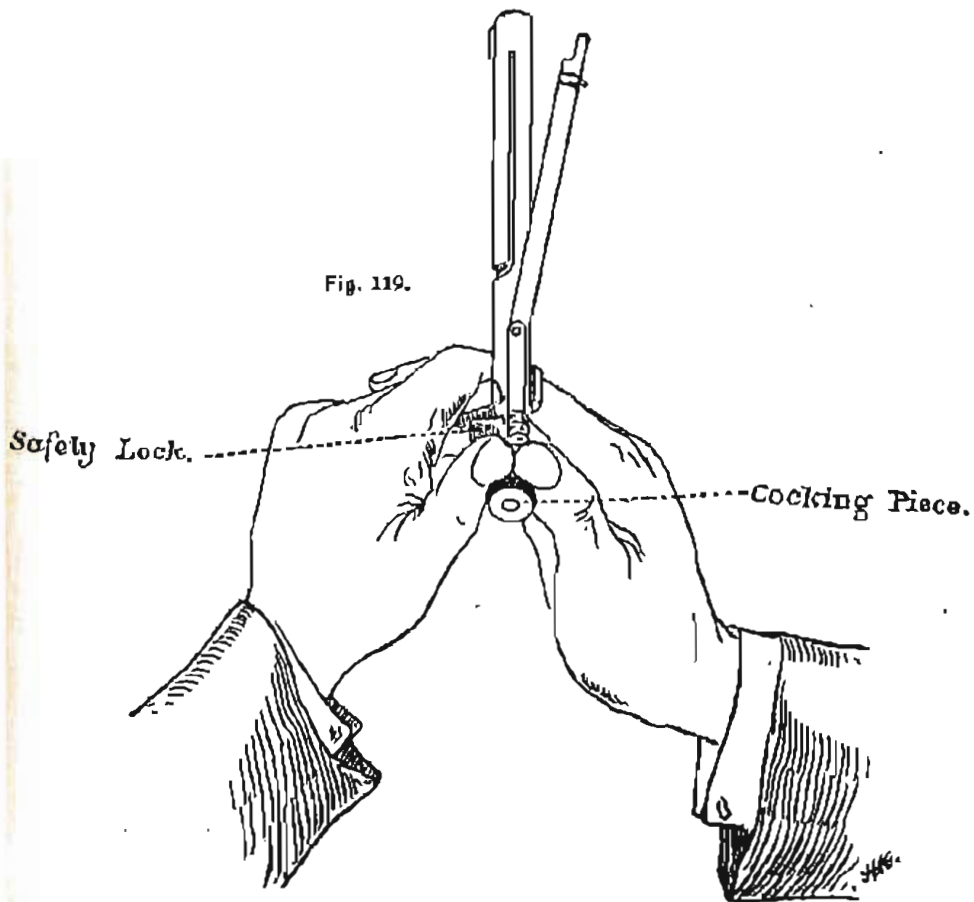
TO ASSEMBLE BOLT MECHANISM.

1. Observe that the safety lock is turned to the left. Reverse the order of the steps of fifth operation in dismounting.

2. Grasp the bolt handle in left hand as in third operation in dismounting and the firing pin in right hand, extractor uppermost. Insert firing pin bolt.

3. Grasp handle of bolt with fingers of both hands, bolt directed downward, and with both thumbs on the rear of safety lock (Fig. 119), push strongly forward and turn to right with thumbs until the arm of the sleeve engages the collar of the bolt.

Fig. 119.



“To most riflemen, the flags indicate not the number of miles per hour of the wind, but so many ‘points’ (of needed correction) on the wind gauge. But realizing the desirability of having a more uniform standard to go by, I seized the opportunity afforded during the 1902 matches of the National Rifle Association to study the effects of accurately measured winds, in so far as the short time permitted. This was made possible by the Signal Corps, N. G. N. J., setting up a recording anemometer; and by keeping record of the wind required at different hours during the day, and subsequently comparing with the anemometer reading for the same time, I ascertained that with my Krag at 800 yards each point on the wind gauge would correct 4 miles of wind per hour, if blowing at right angles to the path of the bullet. A 6 mile an hour wind required $1\frac{1}{2}$ points, a 12 mile wind 3 points, and so on, in perfectly regular proportion. At 900 yards, one-sixth greater allowance was required; and at 1000 yards approximately 25 per cent. more than at 900 yards. (See wind table, pages 48 and 49).

But winds do not always blow directly across the range from right to left, or from left to right; and obviously our calculations must be altered for these obliquities in direction, as well as for differences in force. For convenience, the rifleman refers to the direction of wind by figures on the clock dial. The shooter is regarded as standing in the centre of an immense imaginary clock dial, and the target is supposed to be at 12 o'clock. A wind, then, coming directly from the rear, would be a 6 o'clock wind, one exactly from the right a 3 o'clock wind, one from the left a 9 o'clock wind, while a 12 o'clock wind blows directly in the shooter's face; and the various oblique winds are referred to by corresponding figures.

TABLE OF WIND ALLOWANCES FOR THE KRAG.

Showing the amount of lateral deflection of the bullet produced by winds of different strengths at the target, and the amount of correction on sight (model 1901) required.

DISTANCE (YDS.)	FORCE OF WIND IN MILES PER HOUR.	No. OF INCHES BULLET IS DEFLECTED AT THE TARGET.					
		BY 1-5-7 and 11 o'clock WINDS:		BY 2-4-8-10 o'clock WINDS:		BY 3 and 9 o'clock WINDS:	
		Amount of Deflection	No. of Points on W'd Gauge required	Amount of Deflection	No. of Points on W'd Gauge Required	Amount of Deflection	No. of Points on W'd Gauge Required
800 1 Pt.=48 in.	4	19 in.	$\frac{3}{8}$ pt.	38 in.	$\frac{3}{4}$ pt.	48 in.	1 pt.
	8	39 "	$\frac{3}{4}$ "	77 "	1 $\frac{1}{2}$ "	96 "	2 "
	12	58 "	1 $\frac{1}{2}$ "	115 "	2 $\frac{1}{2}$ "	144 "	3 "
	16	77 "	1 $\frac{3}{4}$ "	154 "	3 $\frac{1}{2}$ "	192 "	4 "
	20	96 "	2 "	192 "	4 "	240 "	5 "
	28	135 "	2 $\frac{3}{4}$ "	269 "	5 $\frac{1}{2}$ "	336 "	7 "
36	173 "	3 $\frac{1}{2}$ "	346 "	7 $\frac{1}{2}$ "	432 "	9 "	
900 1 Pt.=54 in.	4	23 in.	$\frac{1}{2}$ pt.	45 in.	$\frac{3}{4}$ pt.	56 in.	1 pt.
	8	45 "	$\frac{3}{4}$ "	90 "	1 $\frac{1}{2}$ "	112 "	2 "
	12	67 "	1 $\frac{1}{2}$ "	134 "	2 $\frac{1}{2}$ "	168 "	3 "
	16	90 "	1 $\frac{3}{4}$ "	179 "	3 $\frac{1}{2}$ "	224 "	4 "
	20	112 "	2 $\frac{1}{4}$ "	224 "	4 $\frac{1}{2}$ "	280 "	5 "
	28	157 "	3 $\frac{1}{4}$ "	314 "	5 $\frac{1}{2}$ "	392 "	7 "
36	202 "	3 $\frac{3}{4}$ "	403 "	7 $\frac{1}{2}$ "	504 "	9 "	
1000 1 Pt.=5 ft.	4	29 in.	$\frac{1}{2}$ pt.	58 in.	1 pt.	72 in.	1 $\frac{1}{2}$ pt.
	8	58 "	1 "	115 "	2 "	144 "	2 $\frac{1}{2}$ "
	12	87 "	1 $\frac{1}{2}$ "	173 "	2 $\frac{3}{4}$ "	216 "	3 $\frac{1}{2}$ "
	16	115 "	2 "	230 "	3 $\frac{1}{2}$ "	288 "	4 $\frac{1}{2}$ "
	20	144 "	2 $\frac{3}{4}$ "	288 "	4 $\frac{1}{2}$ "	360 "	6 "
	28	202 "	3 $\frac{1}{4}$ "	403 "	6 $\frac{1}{2}$ + "	504 "	8 $\frac{1}{2}$ "
36	259 "	4 $\frac{1}{4}$ "	518 "	8 $\frac{1}{2}$ "	648 "	10 $\frac{1}{2}$ "	

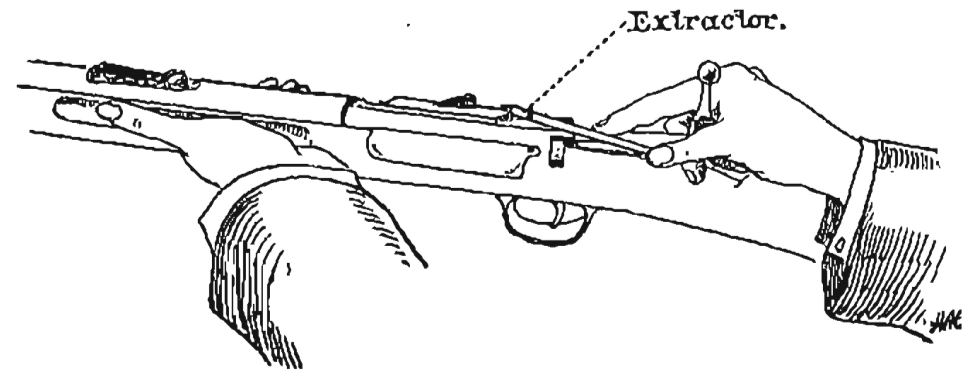
The above figures are approximate, small fractions having been eliminated.

NOTE:—Ranges 800, 900 and 1000 yards are based on my own data: the other ranges have been worked out from Ordnance Department data.

4. Grasp bolt and cocking piece as in third operation for dismounting. Draw back and turn cocking piece from the operator until its nose enters the notch on the rear end of the bolt (see Fig. 118).

5. Take bolt in right hand and introduce it into the receiver, keeping the extractor lifted with the right thumb (Fig. 120). Turn bolt to right and at the same time press strongly with first finger against right side of extractor.

FIG. 120



TO DISMOUNT MAGAZINE MECHANISM

1. The gate being closed, engage the flanged head of a cartridge case under the lug on the front end of the hinge bar head and turn the latter toward the gate, out of its seat; then bear heavily on the gate with the palm of the right hand, to overcome the pressure of the magazine spring, and, with the left, press forward against the lug, drawing the hinge bar pin from the receiver.

2. Remove the gate, magazine spring, carrier and follower.

TO ASSEMBLE MAGAZINE MECHANISM

1. Hold the piece with right side uppermost. Insert arbor of carrier into its hole in receiver and

place end of left thumb across magazine to prevent carrier swinging into the latter.

2. Place magazine spring in its channel, convex side up, rounded end to the rear, particularly observing that the lip at its front end rests in the notch on heel of carrier.

3. Place gate in its seat, lug entering between carrier and magazine spring. Remove left thumb and at the same time press gate against magazine spring with right hand.

4. Insert hinge bar pin in front hinge hole in receiver with left hand, and press gate down strongly until the pin can be pushed through gate into rear hinge hole.

5. After the hinge bar pin is fully home, turn the head into its seat by opening the gate.

The foregoing pages are important. A dirty rifle will not do good shooting. Learn the working parts and keep them clean.

For the working parts and barrel of the Krag one of the best cleaners and rust preventatives known is Dr. Hudson's Nitro Cleaner, for cleaning out the rifle after firing smokeless powder.

"Astral oil (tested and found free from acid), 2 fluid oz. Sperm oil, 1 fluid oz. Turpentine, 1 fluid oz. Acetone, 1 fluid oz. Mix."

[Astral oil is a name applied to a high grade of illuminating kerosene oil, standing a test of at least 110 degrees, and is sold by retailers throughout the country. It can be readily tested for the presence of acid by the use of blue litmus paper, obtainable from druggists.]

"This formula was originally worked up especially for "W. A." powder, but unexpectedly has also

TABLE OF WIND ALLOWANCES FOR THE KRAG.

Showing the amount of lateral deflection of the bullet produced by winds of different strengths at the target, and the amount of correction on sight (model 1901) required.

DISTANCE (YDS.)	FORCE OF WIND IN MILES PER HOUR.	No. OF INCHES BULLET IS DEFLECTED AT THE TARGET.					
		BY 1-5-7 and 11 o'clk. WINDS:		BY 2-4-8-10 o'clk. WINDS:		BY 3 and 9 o'clk. WINDS:	
		Amount of Deflection	No. of Points on W'd Gauge Required	Amount of Deflection	No. of Points on W'd Gauge Required	Amount of Deflection	No. of Points on W'd Gauge Required
200 1 pt. on Gauge gives 12 inches correction at Target.	4	2 in.	$\frac{1}{6}$ pt.	4 in.	$\frac{1}{3}$ pt.	5 in.	$\frac{1}{2}$ pt.
	8	4 "	$\frac{1}{3}$ "	8 "	$\frac{2}{3}$ "	10 "	1 "
	12	6 "	$\frac{1}{2}$ "	12 "	1 "	15 "	1 $\frac{1}{2}$ "
	16	8 "	$\frac{2}{3}$ "	16 "	1 $\frac{1}{3}$ "	20 "	2 "
	20	10 "	1 "	20 "	1 $\frac{2}{3}$ "	25 "	2 $\frac{1}{2}$ "
	28	14 "	1 $\frac{1}{2}$ "	28 "	2 "	35 "	3 "
36	18 "	1 $\frac{3}{4}$ "	36 "	2 $\frac{1}{2}$ "	45 "	4 "	
500 1 Pt. = 30 in.	4	8 in.	$\frac{1}{3}$ pt.	16 in.	$\frac{2}{3}$ pt.	20 in.	$\frac{3}{4}$ pt.
	8	16 "	$\frac{1}{2}$ pt.	32 "	1 pt.	40 "	1 $\frac{1}{4}$ "
	12	24 "	$\frac{2}{3}$ pt.	48 "	1 $\frac{1}{2}$ "	60 "	2 "
	16	32 "	1 pt.	64 "	1 $\frac{3}{4}$ "	80 "	2 $\frac{1}{2}$ "
	20	40 "	1 $\frac{1}{2}$ "	80 "	2 pt.	100 "	3 "
	28	56 "	2 "	112 "	2 $\frac{2}{3}$ "	140 "	3 $\frac{1}{2}$ "
36	72 "	2 $\frac{1}{2}$ "	144 "	3 pt.	180 "	4 "	
600 1 Pt. = 36 in.	4	11 in.	$\frac{1}{4}$ pt.	21 in.	$\frac{3}{4}$ pt.	26 in.	$\frac{3}{4}$ pt.
	8	21 "	$\frac{1}{2}$ pt.	42 "	1 pt.	52 "	1 $\frac{1}{4}$ "
	12	31 "	1 "	62 "	1 $\frac{1}{4}$ "	78 "	2 $\frac{1}{4}$ "
	16	42 "	1 $\frac{1}{2}$ "	83 "	1 $\frac{3}{4}$ "	104 "	3 "
	20	52 "	1 $\frac{3}{4}$ "	104 "	2 "	130 "	3 $\frac{1}{2}$ "
	28	73 "	2 "	146 "	3 "	182 "	5 "
36	94 "	2 $\frac{3}{4}$ "	187 "	3 $\frac{3}{4}$ "	234 "	6 $\frac{1}{2}$ "	

The above figures are approximate, small fractions having been eliminated.

NOTE:—Ranges 800, 900 and 1000 yards are based on my own data: the other ranges have been worked out from Ordnance Department data.

inches at 200, and considerably more than three inches at 300, and so on.

It is for the purpose of correcting these lateral deviations that the wind gauge is supplied on rifle sights. If the wind is blowing the bullet to the left of the point aimed at, then moving the rear sight to the right will cause the barrel to be pointed up into the wind somewhat, if the sights are trained as in the previous shot. And if the movement of the sight has been sufficient, the bullet should hit the target at the point aimed at.

But winds vary both in force and direction, and the effect on the bullet varies accordingly. Therefore, to shoot well, the rifleman must learn to anticipate, with some degree of certainty, what effect a given wind will have upon his bullet, so that he may make the proper correction.

The estimation of the strength of the wind has generally been a matter of guess work with most riflemen, and probably always will be more or less so. They generally judge of its force by noticing its effect upon the flags provided in various parts of the range for that purpose. While experienced shots can often by this means estimate the probable effect of wind with remarkable exactness, they sometimes fail most signally. Nor can this be wondered at when it is remembered that all flags are not the same, either in size, weight of material, etc., and the same flag will be affected far differently when wet and dry."

turned out to be a good rust preventive as well. The best way to use it, which should be done immediately after shooting, is to dip the brass cleaning brush into the solution and scrub it back and forth in the gun a few times; always cleaning from the breech if possible, and allowing the brush to turn and follow the rifling—not pushing it straight through, as I have seen some men do. The gun can then be allowed to stand for a time, when a dry rag should be used on the knob end of the cleaning rod. It is surprising how much black dirt will come out on the rag when the gun appeared to be almost clean. The dry rag should be followed with a second one wet in the solution. It is best to repeat the process next day, for the gases seem to be driven into the pores of the metal and to sweat out during the 24 hours following the firing; hence the necessity of the second cleaning.

"The "W. A." powder residue itself would probably never have to be cleaned out from the gun were it not for the material used in the primer. "W. A." residue is practically harmless, but the products of the primer mixture are extremely corrosive, especially on certain kinds of steel. Therefore, if you want your barrel to last even through one season you must take care of it." (From "Modern Rifle Shooting, From The American Standpoint," by W. G. Hudson, M. D.)

Always be careful of your sights.

The rear sight on the Krag is easily put out of adjustment, and if this happens you will be unable to hit the target. Always put it flat after shooting. The front sight is not so easily affected, but care should be exercised that it receives no hard knocks.

SUMMARY

- Learn all about the working parts of your rifle.
- Keep the barrel and the working parts clean and free from rust.
- Protect your sights.
- Don't be a dummy about the working parts of your rifle.
- Don't lay aside your rifle without cleaning.
- Don't leave your rear sight up after shooting.

CONDITIONS WHICH AFFECT THE FLIGHT
OF THE BULLET

Elevation

1st. Higher adjustment of the rear sight is required by the following conditions, because they either depress the bullet or cause a finer sight to be taken involuntarily:

(a) Low Temperature; (b) High Barometer; (c) Winds blowing more directly from the Target to the Shooter; (d) Light changing from Bright to Less Light (like a cloud partially obscuring the sun); Bright Light on Front Sight; Much Vapor or Mirage.

2d. Lower adjustment of rear sight is required by opposite conditions, such as: (a) High Temperature; (b) Low Barometer; (c) Rear Winds; (d) Bright Target; Dark Sights; Clearing off of a Mirage. All of these cause the shot to strike higher.

Dr. Hudson in his book entitled "Modern Rifle Shooting from the American Standpoint," has gone into this matter in such a readable and comprehensive way that several pages from it are here inserted, together with his "Table of Wind Allowances for the Krag."

"Wind affects the bullet very much as the current of a river affects a boat which is propelled across it toward a definite point on the opposite shore; but with this important difference: the boat keeps up an approximately even pace, and if aimed partly up-stream to just the correct angle, its course across the river will be in a straight line. But the velocity of the bullet is continually decreasing, as we have seen, and therefore the deflected path of the bullet is a curved line, as in the case of the trajectory. So that if the wind deflects a bullet to the extent of one inch at 100 yards, it will deflect it more than two

CHAPTER IV OUTDOOR RIFLE SHOOTING

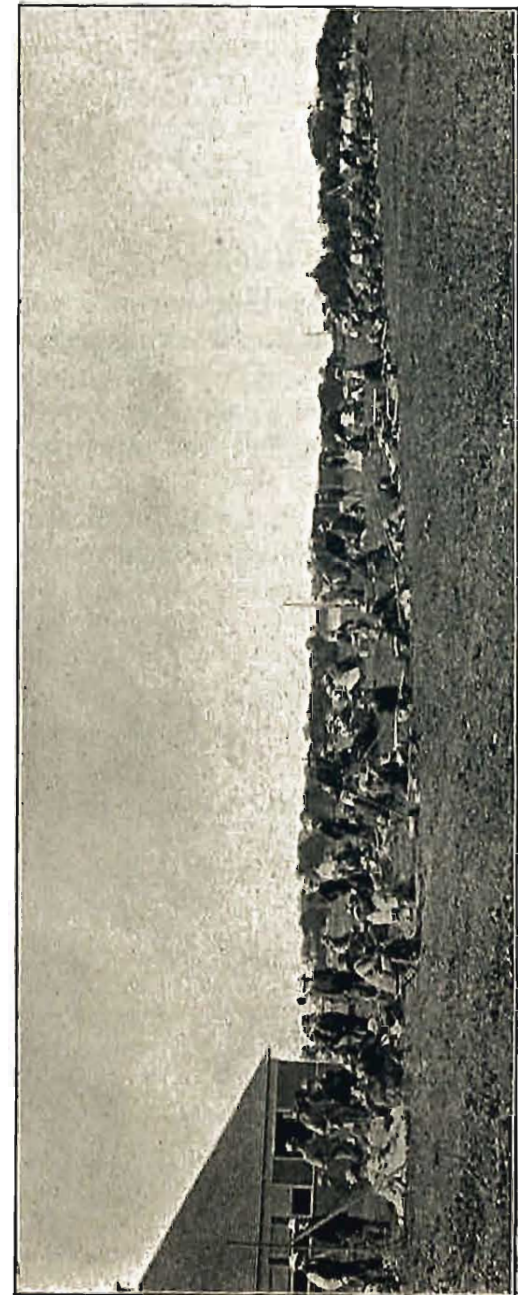
The zero

Without question a great deal of care and attention is given to placing the sights on the Krag, yet the actual zero of the gun rarely corresponds with the lateral zero on the wind gauge. It therefore becomes necessary to find the actual zero of the rifle you are shooting with, *upon which all calculations for windage should be based.* To ascertain this, take a perfectly quiet day and shoot a number of shots at a target 100 or 200 yards away, using a rest if necessary. By careful observation you will soon determine how much, if any, your rear sight must be swung to right or left to get required results. On most of the Krags the actual zero is generally from $\frac{1}{4}$ to $\frac{1}{2}$ left wind, but some will be found to require $\frac{1}{2}$ or even one point of right wind.

The actual zero being obtained always remember to work from it; thus, if your zero is $\frac{3}{4}$ point left wind and a two point left wind is blowing, your sight should read $2\frac{3}{4}$ left. If a one point wind is blowing from the right your sight would then be $\frac{1}{4}$ right.

The Score Book

If you intend to become a first-class shot you will find a **score book** an absolute necessity, and it should be used every time you shoot on the range, making note of all conditions—as marked in a good score book—which tend to have any influence on the flight of the bullet. After you have been shooting a while you will frequently find a day with identical conditions, and be able to get right down to business without shooting all over the place to find the target.

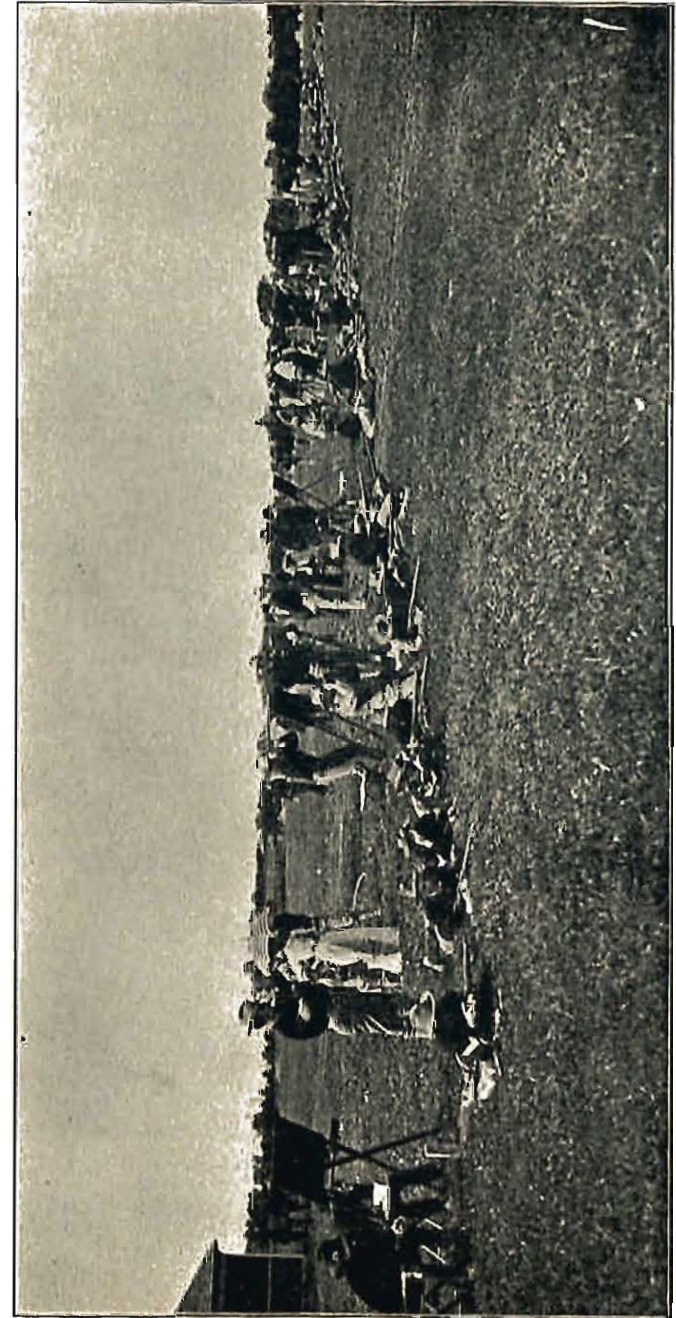


CHAPTER II

AIMING AND SIGHTING DRILL.

The aiming and sighting drill generally starts with placing a rifle on a sand bag rest, or anything which will hold it firmly, high enough to prevent stooping. Sight the rifle carefully at a small target (made by a black paster fastened on a sheet of white paper) placed on the wall about 20 feet away. A proper aim should appear like figure in margin,

"A" being the aperture or "peep" in the rear sight, "B" the bullseye and "C" the front sight brought half way up into the "peep" and just far enough under the bullseye to show a fine white line. Don't bother about the rear sight, use the round hole to "peep" through, bring the front sight half way up in it and hold that just under the bullseye—in this illustration the front sight and bullseye are largely exaggerated—if you don't keep a white line between your front sight and the bull you are liable to hold away up in the black and get high shots. Work on this till you are satisfied you know what a proper sight is.



SUMMARY

Learn to set your sight.

Allow about a point of left wind for short distances, with reduced loads.

Study the different firing positions carefully. Try them all and select the most comfortable.

Using the prone position, always lie at an angle with your rifle. It saves the shoulder.

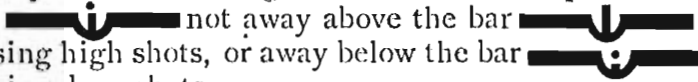


Use the gun sling.

In scoring remember that a shot on a line is credited to the higher value.

If possible, learn to load your own ammunition.

Remember that eyes and rifles are not all the same for producing results, therefore, study the setting of your sights and find the normal of yourself and the rifle.

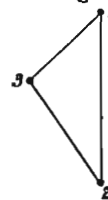
Through what many skilled riflemen declare a short sighted policy the Government has been issuing Krag rifles to the National Guard which are not equipped with the aperture sight. Some States have objected most strenuously to this, and one State considered the matter so important that it insisted until a substitute aperture was placed on the open sight of each rifle.

Should, therefore, your rifle be equipped with the 1898 or open sight care must be exercised to bring the top of the front sight even with the top of the bar,  not away above the bar  causing high shots, or away below the bar  causing low shots.

Now test your sighting. To do this you will need an assistant provided with a black disk $\frac{1}{2}$ inch in diameter pasted or inked on a piece of heavy white cardboard about the same width and 12 or 14 inches in length. There must be a hole in the center of the black disk large enough to admit the point of a lead pencil. Now replace your former target with a sheet of white paper, take your position at the rifle, sight, and have your assistant move the black disk as you direct until you feel you have a perfect sight as above described. Call "Mark." Have the disk held in that position till a mark has been made on the paper by a pencil inserted into the hole in the center of the disk. Stand erect for a minute, then repeat the sighting and marking. Do this three times, and if the pencil marks are within a half inch circle your sighting has been correct each time. If not, lines drawn from one point to another will demonstrate your faults. For instance, if you get a triangle like this it would indicate that "1" was taken with a coarse sight, "2" with a fine and "3" with a half sight, but to the left of the center.

PLATE G.

Fig. 1.



This drill is of the utmost importance to the beginner, and even fairly good shots will greatly benefit by going into it thoroughly. Of the three kinds of sights used in shooting the half sight has been found to give the most satisfactory results at all times, as it can be adhered to with greater uniformity. This is true using either the bar or the aperture sight, and the whole idea is to get as nearly as possible the *same sight every time*.

Consequently do not object if your instructor keeps you working on the sighting drill. You will thank him later on. Major Bell's booklet "The Rifle Gallery" goes into this drill most thoroughly and gives an illustration of its importance.

Having mastered the idea of taking a proper sight, you are ready to take the rifle and sight for yourself. And as you are beginning, begin right by learning to hold your sights in a vertical position. In other words, *do not cant your rifle*, that is, do not let the rifle sights slant either to the right or left. The errors due to canting increase with the distance and many an apparently well held gun throws off the target at the long ranges owing to just a little tilt to one side.

Now take your small target again and pin it on the wall about two and one-half feet from the floor. Use a rug or mattress for lying on and assume the position shown in plate VII figures 1 and 2, page 40. (To many this will seem like putting the last position first, but it is unquestionably the easiest way to hold a rifle steady, and the beginner should have every advantage in his first attempts at sighting and shooting.) Cock the rifle by opening and closing the action and take aim at the bullseye.

When you find you are getting something like the proper sight begin to take up the drag of your trigger.

AMMUNITION

In the majority of instances your ammunition will be furnished; yet it is worth while to know what you are shooting, and if possible to learn to load your own shells. These can be purchased from private manufacturers or drawn by requisition from the Government. The gallery shell made by the Government at Frankford Arsenal is especially adapted for loading light bullets.

For ranges from 40 to 100 feet in length load 3 to $3\frac{1}{2}$ grains of Laflin & Rand "Unique" Smokeless Powder with either "O" Buck Shot, the 100 grain .303 Savage, the .32 S. & W. short or the 87 grain Ideal No. 308245 bullet. (In case you are using the regular shell and not the gallery shell, the ball must be prevented from slipping down on the powder by means of an Indenter made by the Ideal Mfg. Co.)

For ranges up to 100 yards load 7 to 9 grains' weight of "Unique," using the 150 grain Ideal bullet No. 308241 or the 175 grain Hudson bullet No. 308223.

In case shells are to be reloaded the primers to use are the U. M. C. $7\frac{1}{2}$, the Winchester $2\frac{1}{2}$ W. or the Peters $2\frac{1}{2}$ S.

Ordinarily five shots is called a full score.

Bear in mind all the time that indoor gallery work is business, not play. If your work in the gallery has been thoughtful and thorough you will find that your outdoor range work will be a much easier proposition, because you will be free to devote your time to studying the conditions which affect the bullets' flight, as described in the next chapter.

THE GUN SLING

The new firing regulations of the army permit the use of the gun sling at any distance, provided it is not detached from the piece—that is, the swivel of the lower band and the butt swivel. This permission should be taken advantage of from the beginning, as the gun sling helps greatly to secure steadiness in aiming. The adjustment of it is a trifle difficult at first, but when once learned the sling will prove a blessing in helping to make fives.

Having decided on the position which will suit your style of figure, and your sight being set, you will now have the chance to show what you learned in the aiming and sighting drill. Don't be discouraged if your first scores are not good ones. Keep at it carefully and thoughtfully. Try to remedy mistakes. It is hard to remember all the rules all the time. Master them one at a time, and you will be surprised to find how they will help you to make good scores.

SCORING

The bullseye counts five, the circle surrounding the bull, called an inner, counts four, the circle surrounding that, called a mag-pie, counts three, the rest of the target, called an outer, counts two. Credit should be given to the highest score of the shot, any shot cutting a line being credited to the higher value. Thus a shot almost wholly in the white but just nipping the bullseye should be counted a five, etc. You should be given credit, if you have fired five shots and six appear on your target, for the five highest shots, as evidently some one has fired on your target. Thus a miss is recorded for the offender.

This can be done slowly or quickly, but when it is taken up and you feel that your sight is about right, *hold your breath*, and *squeeze* gently but firmly, until the firing pin rod has been released.

When firing a rifle never pull the trigger, always squeeze it; otherwise you spoil many a fine aim.

In shooting parlance the bullseye is a supposed clock face, the perfect hold being just under six o'clock. The top of the bull is 12 o'clock, while the extreme right and left points are at 3 and 9 o'clock, etc.

After careful practice in sighting and snapping you will find yourself able to call your shots, or where, supposing you were really shooting, the bullet would strike. When you feel that you can call your shots you are ready to take up the actual work of shooting.

SUMMARY

Always bring your front sight half way up into the notch or peep.

Always hold just under the bull at six o'clock.

Take the same sight every time.

Hold your breath when about to fire.

Squeeze the trigger.

Don't take a fine sight one time and a coarse sight at another time.

Don't cant your rifle.

Don't breathe when about to fire.

Don't *pull* the trigger.

CHAPTER III

INDOOR GALLERY WORK

Indoor gallery work has become recognized as the most essential and surest way to develop men in shooting, as it trains the eye, the muscles and the nerves just as surely as outdoor range firing, while it enables one to have the important mistakes in position, sighting and holding corrected, either by an instructor detailed for that purpose, or by one's own observation of the results accomplished.

Under present conditions the Krag, with a reduced load of smokeless powder and a light bullet in the regular shell, can be used effectively and pleasantly wherever a forty foot, or longer, range can be located indoors, as the noise and odor are very slight. In this instance the range will be considered established. You are going to shoot on it, and having learned the sighting and aiming drill it is now "up to you" to set your sight.

Of course, setting the sight depends upon the ammunition you are using and the distance to be shot over, also on just how your eye has acted in learning the half sight. However, using loads described later (see page 42), and with a range from

in aiming the piece it points at an angle of about thirty degrees with the body. It should never be

PLATE VII.



Fig. 1.—Firing Lying Down.



Fig. 2.—Firing Lying Down.

fired unless pointing somewhat obliquely to the body as the recoil from a full charge fired otherwise is liable to painfully injure the shoulder.

PLATE VI.



Fig. 2.—Firing Sitting Down.

A very convenient position not shown in the plates may be assumed by a person of spare build by placing the left arm over the left knee and aiming the rifle over the elbow where it rests on the knee-joint, holding the piece only by the right hand, with the left grasping the wrist of the right. Some catch hold of the sleeve. This position is assumed by most of the expert range shots.

The prone position is the easiest and most comfortable of any required of the soldier in target practice, and is shown in Plate VII, Figs. 1 and 2. It is assumed by lying flat, face downward with the legs spread well apart with toes turned outward. Some prefer to cross their legs. This feature should be left to the individual preference of the soldier. The legs should be inclined well to the left, so that

40 to 100 feet in length, setting the sight at 300 to 400 yards elevation will be found approximately correct. But this is not all. Owing to the twist of the Krag rifling the bullet at short distances swings out to the right. This must be counteracted by setting your wind gauge to one point left wind. This is approximate, some shooters of rifles require two points, others only one-half point. (In loosening the cam which holds the wind gauge an *empty* cartridge case will be found most serviceable.)

Everything being ready for you to shoot it will be well to study the following plates to get an idea of the different positions.

These plates are published through the courtesy of the War Department.

There are four positions in which you should learn to shoot; 1st, standing, for guard duty and sudden surprise. This is for all practice up to and including 200 yards; 2d and 3d, kneeling or sitting, for skirmish or hillside work, used at 300 yards; 4th, prone, for making rushes and holding positions in a flat country, used for all other distances. The range and gallery positions are identical.

Plates II, Fig. 1; II, Fig. 2; III, Fig. 1; III, Fig. 2; IV, Fig. 1; IV, Fig. 2, are introduced for the purpose of showing the various standing positions which may be assumed in firing. The soldier must be impressed with the necessity of standing erect and facing the targets, until the order to commence firing is given. He should then bring his right foot to the rear, from 6 to 10 inches, so as to stand firm, facing half right. Bring the piece to the shoulder and up to a height which makes it unnecessary to bend the head but slightly forward to bring the eye in line of sight. The piece will rest better if the elbow of the right arm is slightly elevated.

PLATE II.



Fig. 1.—Firing Standing—Body Rest.

PLATE V.



PLATE VI.



Fig. 1.—Firing Sitting Down.

PLATE V.



Fig. 1.—Firing Kneeling.

Except for volley firing the kneeling position is very little used, as better results are obtained by assuming the sitting position. See Plates V, Fig. 1; V, Fig. 2; VI, Fig. 1; VI, Fig. 2. The figures so clearly show how these positions may be assumed that an extensive description of them is unnecessary.

PLATE II.

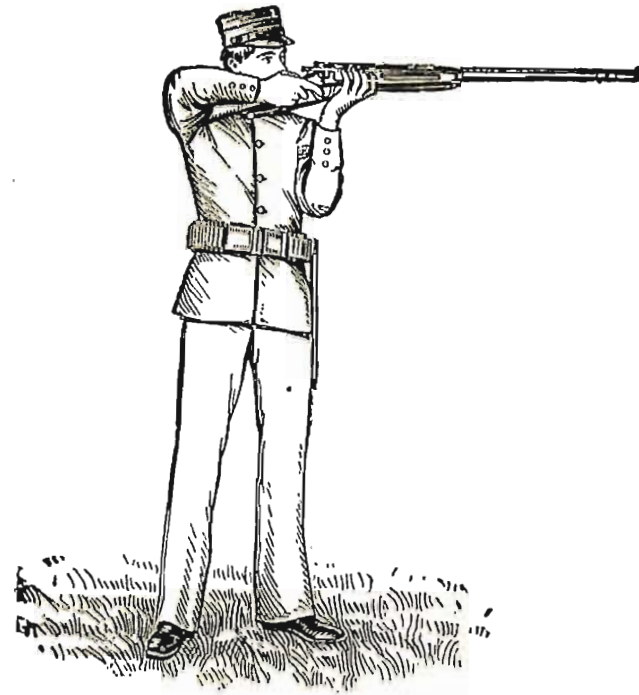


Fig. 2.—Firing Standing—Body Rest.

PLATE III.



Fig. 1.—Firing Standing—Half Arm Extended.

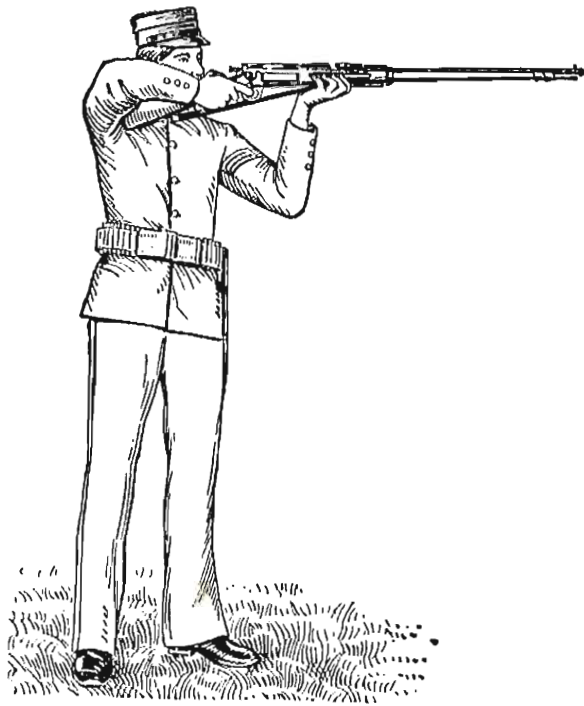


PLATE IV.

Fig. 2.—Firing Standing—Half Arm Extension.



Fig. 1.—Firing Standing—Full Arm Extension.

PLATE IV



Fig. 2.—Firing Standing—Full Arm Extension.

The manner of holding the rifle with the left hand, whether with the arm extended or with it against the body, is purely a matter of individual preference. All of the positions should be tried and the one found to be the most comfortable, adopted.

Good shooting cannot be done in a constrained position.